ABSTRACT

THE EFFECT OF ABILITY-BASED VERSUS EFFORT-BASED PRAISE ON TASK PERFORMANCE AND PERSISTENCE FOR CHILDREN WITH GIFTEDNESS

by Jessica Schmidt

The purpose of this study was to examine if there is a difference in students with giftedness in mathematics on task persistence and task performance on a tiered mathematical (e.g., Below, At, and Above the student’s capability level) task after receiving either ability- or effort-based praise. Four students in the 3rd grade that were identified as gifted/talented in mathematics participated in this study in a small group setting. While completing these mathematical tasks, either ability- or effort-based praise was delivered to the small group depending on the condition. Each student’s task performance was measured by the percentage correct on mathematical task. Each student’s task persistence was reported as the percentage of time the student was on task using the Behavioral Observation System. Results suggest task performance decreased with both the use of ability- and effort-based praise. Results also suggest that task persistence decreased when provided ability-based praise. Implications, limitations, and future directions are provided.
THE EFFECT OF ABILITY-BASED VERSE EFFORT-BASED PRAISE ON TASK PERFORMANCE AND PERSISTENCE FOR CHILDREN WITH GIFTEDNESS

A Thesis

Submitted to the
Faculty of Miami University
in partial fulfillment of
the requirements for the degree of
Specialist in Education
Department of Educational Psychology
by
Jessica Lee Schmidt
Miami University
Oxford, OH
2012

Advisor: ___________________________
Dr. Amity L. Noltemeyer

Reader: ____________________________
Dr. Jason T. Abbitt

Reader: ____________________________
Dr. Michael Todd Edwards
## Table of Contents

List of Figures  
Dedication  
Acknowledgements  
Introduction  
Literature Review  
Methods  
Results  
Discussion  
References  
Figures  
Appendices

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>List of Figures</td>
<td>iii</td>
</tr>
<tr>
<td>Dedication</td>
<td>iv</td>
</tr>
<tr>
<td>Acknowledgements</td>
<td>v</td>
</tr>
<tr>
<td>Introduction</td>
<td>1</td>
</tr>
<tr>
<td>Literature Review</td>
<td>2</td>
</tr>
<tr>
<td>Methods</td>
<td>8</td>
</tr>
<tr>
<td>Results</td>
<td>13</td>
</tr>
<tr>
<td>Discussion</td>
<td>16</td>
</tr>
<tr>
<td>References</td>
<td>22</td>
</tr>
<tr>
<td>Figures</td>
<td>24</td>
</tr>
<tr>
<td>Appendices</td>
<td>28</td>
</tr>
</tbody>
</table>
List of Figures

<table>
<thead>
<tr>
<th>Figure</th>
<th>Page Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Figure 1: Task persistence for Corey</td>
<td>24</td>
</tr>
<tr>
<td>Figure 2: Task persistence for Mia</td>
<td>24</td>
</tr>
<tr>
<td>Figure 3: Task persistence for Madison</td>
<td>25</td>
</tr>
<tr>
<td>Figure 4: Task persistence for Draven</td>
<td>25</td>
</tr>
<tr>
<td>Figure 5: Task performance for Corey</td>
<td>26</td>
</tr>
<tr>
<td>Figure 6: Task performance for Mia</td>
<td>26</td>
</tr>
<tr>
<td>Figure 7: Task performance for Madison</td>
<td>27</td>
</tr>
<tr>
<td>Figure 8: Task performance for Draven</td>
<td>27</td>
</tr>
</tbody>
</table>
Dedication

This paper is dedicated to my parents, Jim and Jackie Schmidt, brother Jordan, and loving fiancé, Pat Hensley, for providing me with the love and support throughout this journey.
Acknowledgements

I would like to acknowledge Dr. Amity Noltemeyer for her help and direction with this research project. Amity, you have been a constant support through this process. Thank you for all of your guidance, generosity, and support.

And

Jillian Black, I grant you many thanks for your generosity of time. I could not have completed it without your contribution.
Introduction

Teachers are consistently searching for new ways to foster their students’ academic engagement through motivation. Starting in the 1970’s, researchers developed an interest in what drives motivation. In order to better understand this concept, experiments were conducted to examine the effects of external rewards on an individual’s intrinsic motivation (Deci, Ryan, & Koestner, 1999). Intrinsic motivation was defined by DeCharms (1968) as an individual’s driving force to be the one in charge of his or her own behavior and change within his or her own environment. Since DeCharms first proposed this definition, there have been conflicting results demonstrating the true effects of external rewards on intrinsic motivation. This topic continues to be explored, particularly among students with learning disabilities and behavioral disorders in the school setting. However, when dealing with motivation, research has been particularly limited with students who have been identified as gifted. This lack of research may reflect a general belief that gifted students already have a favorable amount of intrinsic motivation.

Although research has been conducted to examine the effects of external rewards on an individual’s intrinsic motivation, there has been limited research involving students who have been identified as gifted and what drives their motivation. Research in this area could provide insight into new and exciting ways to help teachers motivate and provide support to these students in achieving to their academic potential. The purpose of this study is to examine if there is a difference in students with giftedness in mathematics on task performance and persistence on a tiered mathematical (e.g., Below, At, and Above the student’s capability level) task after receiving either ability- or effort-based praise. It is hypothesized that students will be more persistent on a task when receiving effort-based praise than when receiving ability-based praise, specifically when the task is at and above the student’s current performance level. Also, it is hypothesized that students will complete the task more accurately when provided with effort-based praise than when provided with ability-based praise, specifically when the task is at and above the student’s current performance level. It is hypothesized that students’ performance and persistence on below performance level task, will not change when provided with ability- or effort-based praise.
Literature Review

The overjustification effect is explained by the notion that external rewards might decrease and have a negative effect on an individual’s intrinsic motivation (Cameron & Pierce, 1994; Cameron & Pierce, 2002; DeCharms, 1968; Deci, Koestner, & Ryan, 1999; Eisenberger & Cameron, 1996; Greene & Lepper, 1974; Tall & Hall, 1995). This means that when an individual first participates in an activity, he or she is initially intrinsically motivated to do so. Once an external reward (i.e., a consequence) has been given for performing a certain task, the reasons why that behavior is occurring (i.e., antecedent) begin to change. This then causes the actual function of behavior to become altered. Research suggests that when participants acquire a numerous consequences for participating in the behavior, it has an effect on their intrinsic motivation, causing it to no longer be considered accountable for performing the task (Cameron & Pierce, 2002).

According to the theory of personal causation, an individual is thought to be the driving force of intrinsic motivation, and is believed to be in charge of his or her own behavior. To expand upon this, DeCharms (1968) states that it is human nature to control the choice that one makes, rather than being controlled by external rewards or factors. In order to support his belief of human nature, Deci conducted three different experiments in 1971. The focus of these experiments was to examine the effects of external rewards on college student’s intrinsic motivation when dealing with non-academic tasks. The external rewards (reinforcers) that were presented in these experiments consisted of money, verbal reinforcement, and positive feedback. Deci’s (1971) first two studies investigated the use of money as the external reward, while the third study investigated the use of verbal reinforcement and positive feedback. He hypothesized that external rewards would lead to a decrease in an individual’s intrinsic motivation, garnering support for the overjustification effect in which external rewards have a negative effect an individual’s intrinsic motivation.

Deci’s (1971) first experiment involved 24 college students who were enrolled in an introduction to psychology course, and his second experiment involved 8 college students who were also enrolled in an introduction to psychology course. Each student was required to complete three separate, fifteen-minute sessions in a classroom on campus. In each session students completed a Soma, which is a cube geometric construction activity. In order to measure the individual’s motivation for the Soma activity, Deci first operationally defined motivation as
the amount of time spent working on the puzzle during the session. As well as collecting observational data, the participants were required to complete a rating scale in which they self-reported their enjoyment of the activity. During session one, every student participated in the Soma, and there was no condition applied. This allowed the research to first collect the baseline data on the amount of Soma completed and the students’ motivation level for each group. In the second session, the experimental group received one dollar for every Soma construction that they completed. This is considered the external reward. In the third session, the researcher explained to the participants in the control group that they would not be receiving money for their completed puzzles. The findings from these studies supported the notion of the overjustification effect. Deci found that a student’s intrinsic motivation to participate in a task, as well as complete the task, does decrease after an external reward (i.e., money) is applied and then removed.

Unlike the first two studies, which took place in a classroom, Deci’s third experiment was completed in a laboratory setting. In this study the same procedures were conducted, except the students in the experimental group received verbal rewards instead of money. Although his results from the previous two studies showed a decrease in intrinsic motivation once an external reward has been applied and removed, the third study found differing results. In the third study, Deci found that the level of intrinsic motivation that was previously expressed by the students through the baseline data stayed consistent across all sessions after verbal rewards were given, and then removed in session three. However, the control group expressed a significant difference in intrinsic motivation, in which data showed a decrease in intrinsic motivation for the activity. This encouraged Deci (1971) to suggest that verbal rewards do not seem to have the same affect as tangible rewards, and could be due to the fact that they are seen as a type of social reinforcement, such as approval.

The results of Deci’s study from 1971 can be easily explained through attribution theory, as well as the behaviorist perspective. Attribution theory is used to explain the process that individuals engage in when interpreting causal questions. This theory explains the change in intrinsic motivation through the concept of the “subtraction rule.” Cameron and Pierce (2002) explain the subtraction rule as an individual’s ability to disregard a potential function of a behavior. The subtraction rule explains that this is due to the fact that there are other potential causes that ultimately affect the function of specific behaviors. This can be demonstrated in
Deci’s (1971) research, in which the college students disregard the primary function of the behavior (intrinsic motivation), which is participating in the Soma during baseline. Then the students are affected by other potential causes (external rewards/reinforcers), which then changes the function of participating in the Soma (behavior) during session two and three.

The behaviorist perspective explains the change in the individual’s intrinsic motivation through other concepts. According to Eisenberger and Cameron (1996), behavioral theory views actions as lawful, with predictable outcomes in which successful behaviors that are reinforcing become more frequent, and those behaviors that are not reinforcing begin to decrease and/or lead to extinction. However, there is a difference between a reward and a reinforcer. Rewards do not always increase a behavior but are thought to be encouraging; however, a reinforcer always increases the frequency that a certain behavior(s) occurs (Cameron 2001; Cameron and Pierce, 1994, 2002).

Since 1971, there have been many studies on these topics, in which researchers have found conflicting results regarding the effects of external rewards on individuals’ intrinsic motivation. Some findings support the use of external rewards. Deci’s study in 1971, as well as Ryan and Deci’s study in 2000 found that individual’s intrinsic motivation can increase if rewards are tangible and unpredictable. However, the initial interest level the individual has for the certain task affects how the reward truly impacts his or her intrinsic motivation following receiving the reward (Daniel & Esser, 1980; Loveland & Obey, 1979; McLoyd, 1979). Hitt, Marriot, & Esser (1992) found that tangible rewards with high and low value, as well as immediate rewards can increase an individual’s intrinsic motivation, if the task was previously rated as a low interest task.

One form of external reward is a verbal reward. These rewards have been shown through several studies to increase individual’s intrinsic motivation. Across these studies, a consistent form of verbal praise, in which individuals receive sincere and spontaneous praise for an activity, seems to result in an increase in intrinsic motivation (Henderlong & Lepper, 2002). Verbal praise was consistently described as effort-based statements, in which a learning orientation was developed (Pierce, Cameron, Banko, & Sylvia, 2003). Effort-based praise is a strategy used in many different settings ranging from education, to athletics, and even in home activities. Watson (2004) explained that effort-based praise encourages children to develop self-efficacy in which they can review and actively critique their work. Research suggests that effort-
based praise helps to foster an achievement goal of mastery, which is believed to be the most advantageous type of goal when it comes to achievement. This type of goal is can be described as a desire to obtained greater knowledge or mastery to increase competency within different skill sets (Ormrod, 2008). Having this type of goal usually involves students’ actively participating in classroom activities, accompanied with a drive to learn. It is said that students’ with mastery goals understand learning by realizing the steps it takes to complete a task, and the processes which need to be completed even when there might be a difficult problem that delays the process of completion (Ormrod, 2008). Though these setbacks do occur, students are usually motivated to actively solve the problem or situation, which requires developing problem solving techniques. Mastery goals enable the child to view task they may not have experienced with as a chance to develop a wider skill set (Watson, 2004).

Ability-based praise is also used in an attempt to increase motivation. This style of praise is thought to encourage performance goals, rather than a mastery goal. This type of goal drives individuals to perform activities to gain competence in the eyes of others. According to Muller and Dweck (1998), 85% of parents believed that when providing praise on their child’s abilities, it will enable the child to feel they are intelligent. It is thought that when encouraging competency within a child, a drive will trigger within the child that will encourage his or her intrinsic motivation to complete the activity, which ultimately increases motivation. Increasing a child’s motivation in achievement can help to develop habits of self-efficacy (Mueller & Dweck, 1998).

Self-efficacy is the feeling that one is competent in certain activities. Ormord (2008) states that self-efficacy is a type of attribution, in which a child believes that he or she has caused the outcome of certain life experiences. Developing a sense of self-efficacy helps the child to find ways that he or she can be competent in these activities and perform them successfully. The child will realize that he or she is responsible for, in this case, achievement. Self-efficacy is directly associated with competence, which is a basic human need. If a child feels that he or she can achieve and perform a goal correctly, then the child deepens his or her sense of competency. It is important for a child to experience this success, which is associated with ability-based praise. By receiving praise for his or her abilities, the child will continue to push to succeed in what he or she does, which will motivate the child to take every step necessary to reach this performance goal. (Ormrod, 2008)
As well as there being research that supports the use of external rewards, researchers have also found results that do not encourage the use of external rewards. This is due to the fact that many studies have found the external rewards which are expected, delayed, and/or are given based upon a performance contingency schedule, have actually decreased intrinsic motivation once the conditions were removed (Cameron & Pierce, 1994; Deci, Koestner, & Ryan, 1999; Hitt, Marriot, & Esser, 1992; Lepper, Greene, & Nisbett, 1973). Along with tangible external rewards, there have been negative effects shown with the use of ability-based praise. This type of praise is thought to encourage the idea the hard work is not needed to perform a task, but rather intelligence is what is the driving force behind the completion of a task (Mueller & Dweck, 1998). Cameron and Pierce (2002) found that praising within a peer setting actually could decrease a student’s intrinsic motivation because it creates completion in which a performance-goal is developed.

**Giftedness and Motivation**

No Child Left Behind (NCLB) defines students that are gifted and talented as “students, children, or youth who give evidence of high achievement capability in areas such as intellectual, creative, artistic, or leadership capacity, or in specific academic fields, and who need services or activities not ordinarily provided by the school in order to fully develop those capabilities” (Title IX, Part A, Section 9101(22), p. 544). Although states and districts are not required by law to apply this federal definition, many of the states do base their definitions on the federal one. In recent studies, researchers have found that gifted students tend to hold high levels of intrinsic motivation. As well as possessing intellectual and/or academic talents, these students are thought to be motivated to learn (Dai, Moon, & Feldhusen, 1998). However, Gottfried, Cook, Eskeles, and Morris (2005) found that there is a difference between motivation and a student’s I.Q. This is known as motivationally gifted, rather than that students who are considered as intellectually gifted. Gottfried et al. conducted a longitudinal study in which 130 students were followed from infancy through the age of 24. In this study, Gottfried et al. examined a variety of academic issues which included intrinsic motivation towards academic task, achievement within the classroom, functioning within the classroom, intellectual performance, and the students’ self concept. These issues were assessed using a comprehensive battery of standardized measures. Gottfried et al. found distinctions between academic intrinsic motivation and an individual’s I.Q. The study supported that those students who were identified as motivationally gifted were not
necessarily the students who were considered to be intellectually gifted. In addition, students who were considered intellectually gifted were four times less likely to attend a four year college than those who were considered motivationally gifted. This leads to concern in the area of those students who are intellectually gifted, and their cause/reason for underachievement.

Phillips and Lindsay conducted a study in 2006 that explored various factors that impacted the motivation of gifted students. The participants involved in this study were 15 gifted students, referred by the researchers as “very able.” Eight of these students were males and seven were females, all ranging within ages of fourteen to fifteen. Phillips and Lindsay used a series of semi-structured interviews consisting of open-ended questions and probes. Each student was interviewed, along with the student’s parents and teachers for validation and to provide extended data. The interviews were meant to address the influence on the student’s motivation, such as support within the learning community, social and emotional factors, personal goal setting, extrinsic motivators, and intrinsic motivation.

Phillips and Lindsay (2006) found that students maintained motivation through appropriate challenges within the classroom and within extra-curricular activities. In the interviews, participants expressed the importance of extra-curricular activities. Their motivation within these activities was evident through their preference for “free time” and their desired to continue to learn these activities. Participants also indicated the importance of praise and encouragement from the teachers and their families as a factor in their motivation. Phillips and Lindsay (2006) also found that students enjoyed some of the activities on their own, without any external rewards. However, there was also evidence through the interviews that students enjoyed the competiveness of the extra-curricular activities and the recognition that they received.

**Purpose**

There are multiple studies that investigate the overjustification effect with the use of external rewards. Deci (1971) suggests that verbal rewards have a different affect on a student’s motivation than tangible rewards. Phillips and Lindsay (2006) reported that praise and encouragement from teachers and families are a factor in student’s motivation. This topic continues to be explored, particularly among general education, learning disabled, and behaviorally disordered students. However, when dealing with motivation, the gifted population of students has been particularly limited. Additionally, the majority of pervious studies have utilized non-academic tasks and/or tasks at the student’s performance level. To address these
In the extant literature, there are two purposes of this study: (1) to examine if there is a difference in students with giftedness in mathematics on task performance on a tiered mathematical (e.g., Below, At, and Above the student’s capability level) task after receiving either ability- or effort-based praise, and (2) to examine if there is a difference in students with giftedness in mathematics on task persistence on a tiered mathematical (e.g., Below, At, and Above the student’s capability level) task after receiving either ability- or effort-based praise. It is hypothesized that students will be more persistent on a task when receiving effort-based praise than when receiving ability-based praise, specifically when the task is at and above the student’s current performance level. Also, it is hypothesized that students will complete the task more accurately when provided with effort-based praise than when provided with ability-based praise, specifically when the task is at and above the student’s current performance level. It is hypothesized that student’s performance and persistence on below performance level task will not change when provided with ability- or effort-based praise.

Methods

Participants

The participants were selected from the gifted and talented program at one suburban elementary school in southwest Ohio. All 3rd grade students identified as gifted in mathematics in the school were invited to participate in the study. These students were asked to volunteer in the study and all four students in the 3rd grade participated. Consent from the parents and assent from the student was obtained prior to the beginning of the study. The participants included two females (both 9 years old) and two males (one 8 years old and the other 9 years old). All four participants were Caucasian. For the purpose of this study the following pseudonyms were given to the participants: Madison (9 year old female), Mia (9 year old female), Corey (8 year old male), and Draven (9 year old male). See Appendix A for the letter sent to the principal to obtain permission to collect data, and also Appendices B & C to review the consent and assent forms.

Setting

The location of the research study was a medium sized elementary school in southwest Ohio. The research took place in a small group setting in which all four participants participated in each condition as a small group. The small group met in an empty classroom at the
elementary school during the experimental conditions. The sessions were completed every Monday, at 11:15 A.M. through 11:35 A.M., during a ten week span. To obtain permission to use this setting, the researcher first sent an informational letter to the principal of the elementary, explaining the purpose and procedures of the study (Appendix A). The researcher then met face-to-face with the principal to further discuss the experiment and answer any questions/concerns that the principal had. Once the meeting was completed the researcher obtained written permission to conduct the experiment at the elementary. Prior to experiment, there was no relationship built between the participants and the examiner. The examiner worked within the school, however, had not made contact with the participants as a group or individually.

**Examiners**

The examiner, a school psychology graduate student, was trained specifically on the protocol required to complete each session. The examiner worked individually with the students and was required to collect data on the performance of the student. All sessions were videotaped to collect data for task persistence. The Behavioral Observation System (BOS; Jones, Wickstrom, & Friman, 1997), systematic coding form to measure time on-task, was used to assess task persistence. This form was used during each eight-minute session to observe if the participant’s behavior was on or off task. The examiner collected and reviewed all data. A second school psychology student trained on the Behavior Observation System (Jones, Wickstrom, & Friman, 1997) reviewed 35% of the videotaped sessions and completed the BOS (Jones, Wickstrom, & Friman, 1997) on these sessions for the purpose of calculating inter-observer agreement.

**Materials**

An AIMSWeb Mathematical Computation (M-COMP) assessment was used to determine the math ability level of each participant. The AIMSWeb M-COMP assesses mathematical computation through accuracy and fluency on math problems. AIMSWeb M-COMP is a standardized assessment that can be administered to students in a whole-group or individually. Students were given eight minutes to solve open-ended mathematical computation problems in the areas of addition, subtraction, multiplication, and division. The M-COMP is appropriate for grades one through eight. Before beginning each session, the students were read the standardized instructions for the AIMSWEB M-COMP assessment. An example of the M-

The Behavior Observation System (BOS) (Jones, Wickstrom, & Friman, 1997) was used to calculate participant’s on-task performance by recording the number of intervals the participant was observed as being on-task or off-task during the assessment. On-task behavior is described as anytime a student is actively engaged in the activity or visually attentive to the activity, where off-task behavior will consist of any other behavior not related to the task at hand. Multiple observers/examiners were used to assist in ensuring inter-observer reliability. An example of the BOS is located in Appendix D.

A video camera was used to record each of the testing sessions. This allowed examiners to review testing sessions to ensure treatment integrity and inter-observer reliability. A MotivAider was used to prompt the examiner to administer the specific praise statements for each experimental condition on a 30 second fixed interval schedule. An accurate timer was used to monitor the eight minute time limit for each M-COMP assessment (e.g. stopwatch, countdown monitor, etc.). Two sufficiently sharpened number two pencils were provided to each participant before engaging in each testing session.

**Dependent Variables**

Each student’s task performance was measured by the percentage of correct items on each mathematical task. The total number of correct responses was divided by the total number of possible responses. The student’s task performance measured by the MCOMP not only to assesses accuracy, but fluency as well. Task persistence was measured by using the Behavioral Observation System (BOS) (Jones, Wickstrom, & Friman, 1997), in which a partial interval observation-recording system was used to measure persistence behaviors. Persistence behaviors were defined as looking and working on the target activity. This variable was reported as the percentage of time the student is on-task using the BOS (Jones, Wickstrom, & Friman, 1997).

**Independent Variable**

Ability-based praise and effort-based praise were the independent variables. Participants were given ability-based praise during the ability-based praise condition. Participants were given effort-based praise during the effort-based praise condition. During the control conditions, no verbal praise statements were given. Effort- and ability-statements can be found in Appendix E.
Procedures

Prior to the application of the independent variables, each student’s baseline data was collected. The first day of data collection lasted 30 minutes, and the students were asked to complete three different grade level Mathematics-Computation (M-COMP) assessments in order to determine each student’s current academic performing level in mathematics. Once the student’s current academic performing level was determined, the four students completed three baseline M-COMP assessments in a small group setting (small group = only the participants of the study), with one being below the students current academic performing level, one at the students current academic performing level, and one above the student’s current academic performing level. Each baseline M-COMP assessment took place on a different day (three days total) and lasted for 13 minutes (eight minutes to complete the standardized M-COMP and five minutes of free choice period). Once all sessions were completed, the examiners reviewed the video tapes, to measure each student’s on-task behavior using the BOS (Jones, Wickstrom, & Friman, 1997; Appendix D).

For this study, students participated in six experimental conditions as a small group (small group = only the participants of the study): (a) an M-COMP assessment below current grade level with effort-based praise, (b) an M-COMP assessment below current grade level with ability-based praise, (c) an M-COMP assessment at current grade level with effort-based praise, (d) an M-COMP assessment at current grade level with ability-based praise, (e) an M-COMP assessment above current grade level with effort-based praise, and (f) an M-COMP assessment above current grade level with ability-based praise. At the beginning of each session, the research orally read the standardized instructions for the AIMSWeb M-COMP assessment to the students. Students were given the appropriate type of praise, either ability- or effort-based, during the appropriate experimental condition in 30 second intervals. See Appendix E for the ability- and effort-based praise statements. The students were given eight minutes to complete the given M-COMP for each experimental condition. After the eight minutes was completed, the students were given the option to continue to work on the assessment or choose a leisure activity for five minutes (draw, read, etc.). The amount of time the student continued to work on the assessment contributed to the student’s on-task persistence during each condition.

Research Design
An alternating treatment design across conditions (experiment and control) was used to determine if the type of praise (i.e. effort- or ability-based praise) had a differential impact on task performance and persistence. Baseline data were collected for the below, current, and above mathematical level of each student during the control conditions. Each of the three conditions (two experimental and one control) were assigned a number (1-9), and a random numbers chart was used to randomize the order of the conditions.

**Analysis**

Using the BOS (Jones, Wickstrom, & Friman, 1997), the examiners reviewed the videotapes independently, which allowed them to observe the participants on and off task persistence. Inter-observer reliability was checked by reviewing 35% of the completed sessions and having another examiner complete the BOS forms for each student in those sessions. This was then analyzed by dividing the sum of the total interval agreements by the total number of intervals recorded. Using this procedure, inter-rater reliability was found to be 95.31%. Treatment fidelity was reported by the session examiner completing a checklist that required each condition statement to be said during each session in order to ensure that the independent variable was correctly implemented to the participants during the condition 100% of the time. Task performance was measured by the percentage of points earned for correct responses given on the M-COMP during each testing session relative to the total number of points possible on the given assessment.

Individual data were graphed, and individual summary statistics were computed (e.g., percentage correct on each task and percentage on task during each session) in order to examine individual findings. In addition, overall summative statistics were computed across the four participants (e.g., average percentage for below, at, and above level of correct on each task and average percentage for below, at, and above level on task) to examine findings as a group. No inferential statistics were used since this practice is typically not recommended with small n designs.

**Protection of Human Subjects**

This study was designed to minimize the potential risks to the subjects beyond those expected of daily life activities. Parents/guardian and students were required to sign consent forms prior to taking part in this study. In addition to being verbalized, the consent forms were
used to indicate that participants have a right to leave the experiment at any time without penalty. Subject data remained confidential and a pseudonym was designated to each student for data recording purposes. Students were debriefed on the ninth day of data collection and they were given access to the results of the study. The study’s proposal was approved by the IRB prior to conducting data collection. The proposed study was, and still is considered confidential. The only identifying information collected was the parental consent forms, assent forms, and videotape of each session. All forms and video tapes were filed in a locked cabinet in a locked office at Miami University. Data sets for the study do not include any personal identification indicators. Each subject was given an experimental pseudonym assigned by the principal experimenter. From the start to the end of the study, including the videotaped sessions, the participants were only identified by their specific pseudonym. Since the end of the experiment, all consent and assent forms have been kept in a locked filing cabinet. All video taped sessions were promptly destroyed after inter-observer agreement was calculated.

**Results**

**Task Persistence**

Task persistence for the four participants is shown in Figures 1 through 4. For each participant (Corey, Mia, Madison, and Draven), there was a change in their task persistence compared to the control condition when they received either ability- or effort-based praise for the tiered mathematical tasks. Overall, all four of the participants demonstrated an average decrease during both an ability- and effort-based praise condition on the tiered mathematical tasks.

Corey’s overall average task persistence, as seen in Figure 1, when compared to the overall control condition remained the same during the control condition and the effort-based praise condition; however, it decreased during the ability-based praise condition (-4.17%). When compared to the control condition for the below ability level task, Corey’s task persistence remained the same when provided ability-based statements (93.75%); however, it increased when provided effort-based praise (+6.25%). Corey’s task persistence when compared to the control condition at his ability level remained the same when given ability-based praise and effort-based praise (100.00%). Corey’s task persistence on the above ability task decreased compared to the control condition when provided ability-based praise (-6.25%); however, it remained the same when provided effort-based praise (100.00%).
Mia’s overall average task persistence, as seen in Figure 2, decreased compared to the overall control condition during the ability-based praise condition (-4.2%), but remained the same when provided effort-based praise (100.00%). When compared to the control condition for the below ability level task, Mia’s task persistence remained the same when provided effort-based statements (100.00%); however, it decreased when provided effort-based praise (-6.25%). Mia’s task persistence at her ability level remained the same compared to the control condition when provided effort-based statements (100.00%); however, it decreased when provided effort-based praise (-6.25%). Mia’s task persistence on the task above her ability level remained the same compared to the control condition when provided ability- and effort-based praise (100.00%).

However, Madison’s overall average task persistence, as seen in Figure 3, when compared to the overall average control condition decreased with both ability- (-4.2%) and effort-based (-12.5%) praise. When compared to the control condition for the below ability level task, Madison’s task persistence remained the same when provided effort-based statements (100.00%); however, it decreased when provided ability-based praise (-6.25%). Madison’s task persistence when compared to the control condition at her ability level remained the same when given ability-based praise and decreased when provided effort-based praise (-37.50%). Madison’s task persistence when compared to the control condition on the above-ability level task decreased when provided ability-based praise (-6.25%); however, it remained the same when provided effort-based praise (100.00%).

Draven’s overall average task persistence, as seen in Figure 4, when compared to the overall control condition decreased with both ability- (-12.5%) and effort-based (-25%) praise. When compared to the control condition for the below ability level task, Draven’s task persistence decreased with both ability- (-75%) and effort-based praise (-12.50%). Draven’s task persistence when compared to the control condition at his ability level increased when given ability-based praise (+6.25%) and decreased when given effort-based praise (-81.25%). Draven’s task persistence when compared to the control condition above his ability level increased when provided both ability- (+31.25%) and effort-based praise (+18.75%).

**Task Performance**

Task performance for the four participants is shown in Figures 5 through 8. For each participant (Corey, Mia, Madison, and Draven), there was a change in their task performance as
a result of receiving either ability- or effort-based praise for the tiered mathematical tasks.

Corey’s overall average task performance, as seen in Figure 5, when compared to the overall control condition average increased during the ability based praise condition (+3.09%); however, it decreased provided effort-based praise (-9.31%). When compared to the control condition for the below ability level task, Corey’s task performance increased when provided ability-based statements (+6.85%); however, it decreased when provided effort-based praise (-21.24%). Corey’s task performance when compared to the control condition at his ability level remained the same when given ability-based praise (11.18%), and increased when provided effort-based praise (+2.63%). Corey’s task performance when compared to the control condition above his ability level increased when provided ability-based praise (+0.68%); however, it decreased when provided effort-based praise (-0.67%).

Mia’s overall average task performance, as seen in Figure 6, decreased during both the ability based praise conditions (-10.05%) and the effort-based praise conditions (-3.93%), when compared to the overall control condition average. When compared to the control condition for the below ability level task, Mia’s task performance decreased when provided both ability-based statements (-23.52%) and effort-based statements (-5.14%). Mia’s task performance at her ability level decreased when given ability-based praise (-2.05%), and effort-based praise (-2.05%), compared to the control condition performance. Mia’s task performance when compared to the control condition above her ability level decreased when provided ability-based praise (-4.60%), and effort-based praise (-4.60%).

Madison’s overall average task performance, as seen in Figure 7, when compared to the overall control condition average decreased during both the ability based praise conditions (-6.27%) and the effort-based praise conditions (-5.98%). When compared to the control condition for the below ability level task, Madison’s task performance decreased when provided ability-based statements (-5.15%) and increased when provided effort-based statements (+8.09%). Madison’s task performance when compared to the control condition at her ability level decreased when given ability-based praise (-13.01%) and effort-based praise (-26.03%). Madison’s task performance when compared to the control condition above her ability level decreased when provided ability-based praise (-0.65%); however, it increased when provided effort-based praise (+0.01%).
Draven’s overall average task performance, as seen in Figure 8, when compared to the overall control condition average decreased during both the ability based praise conditions (-16.96%), and effort-based praise conditions (-7.36%). When compared to the control condition for the below ability level task, Draven’s task performance decreased when provided ability-based statements (-39.71%); however, it increased when provided effort-based praise (+14.71%). Draven’s task performance when compared to the control condition at his ability level decreased when given ability-based praise (-16.43%), and effort-based praise (-32.19%). Draven’s task performance on the task above his ability level increased when provided ability-based praise (+5.26%) and decreased when provided effort-based praise (-4.60%), compared to the control condition mean.

Discussion

The purpose of this study was to examine if there is a difference in students with giftedness in mathematics on task persistence and task performance on a tiered mathematical (e.g., Below, At, and Above the student’s capability level) task after receiving either ability- or effort-based praise. Several studies have demonstrated that a consistent form of verbal praise, in which individuals receive sincere and spontaneous praise for an activity, seems to result in an increase in intrinsic motivation (Henderlong & Lepper, 2002). However, the results reported in this study are inconsistent across participants. Therefore, more research is needed in order to generalize these finding to different populations, specifically the gifted community.

The persistence for the four participants is shown in Figures 1 through 4. For each participant (Corey, Mia, Madison, and Draven), there was a change in their task persistence, compared to the control condition, as a result of receiving either ability- or effort-based praise for the tiered mathematical tasks. Based on the overall average persistence of all participants during the effort-based praise conditions, the participants’ persistence decreased 9.37% compared to the control condition. Based on the overall average persistence of all participants during the ability-based praise conditions, the participants’ persistence decreased 6.77% compared to the control condition. Taken together, these results would not support the previously stated hypothesis that students receiving effort-based praise will be more persistent on the task than when receiving ability-based praise, specifically when the task is at and above the student’s current performance level. Also, these results are inconsistent with previous research findings that suggest a consistent form of verbal praise, in which individuals receive sincere and spontaneous praise for
an activity, seems to result in an increase in intrinsic motivation (Henderlong & Lepper, 2002). Although the reasons for these inconsistencies are unknown and warrant future research, it is possible that the technique in which the praise was provided (administered to the entire small group, rather than individually) affected the way the students interpreted and perceived the praise.

Individual differences in response to effort- and ability-based praise did emerge. Corey’s overall average persistence remained the same during the control condition and the effort-based praise condition; however, his overall average persistence decreased during the ability-based praise condition. This is inconsistent with Deci et al (1999) who suggest that male students respond negatively to effort-based praise and positively to ability-based praise. Mia’s overall average persistence decreased during the ability-based praise condition and remained the same with effort-based praise. This is consistent with the results reported by Deci et al (1999) that suggest that female students responded negatively to ability-based praise, and positively to effort-based praise. Mia’s task persistence remained at 100% during the tiered mathematical task in which she received effort-based praise. However, Madison’s overall average task persistence decreased with both ability- and effort-based praise. Draven’s overall average task persistence also decreased with both ability- and effort-based praise. Again, these results are inconsistent with previous research suggesting that effort-based praise will increase task persistence in females and decrease task persistence in males (Deci, Koestner, & Ryan, 1999). Although the reasons for these inconsistencies are unknown and warrant future research, it is possible once again that the delivery of the praise affected the student’s responses. Previous research suggests that external rewards that are expected or given based upon a schedule, actually decrease intrinsic motivation once removed (Cameron & Pierce, 1994; Deci, Koestner, & Ryan, 1999; Hitt, Marriot, & Esser, 1992; Lepper, Greene, & Nisbett, 1973). It is possible that the students began to interpret the schedule in which the praise was offered, which in turn affected their intrinsic motivation.

Based on the overall persistence averages on tasks below the participants’ performance level, when compared to the control conditions, the participants’ persistence decreased 21.88% when given ability-based praise and decreased 1.58% when given effort-based praise. Based on the overall persistence averages on task at the participants’ performance level, the persistence’s remained the same as the average control condition (98.44%) when given ability-based praise,
and decreased 29.69% when given effort based praise. Based on the overall persistence averages on task above the participants’ performance level, the participant’s persistence increased 4.69% when given ability-based praise, and effort based praise. It was hypothesized that students when receiving effort-based praise would be more persistent on the task than when receiving ability-based praise, specifically when the task is at and above the student’s current performance level. Portions of this hypothesis were proven to be true. Based on these results, the participants persistence increased when the task was above their performance level and they were provided effort-based praise, however, their persistence decreased when the task was at their current performing level. Also based on these results, the participants’ persistence remained the same or increased when the task was at their current performance level or above their current performance level.

This study also examined whether there is a difference in students with giftedness in mathematics on task performance on a tiered mathematical (e.g., Below, At, and Above performance level) task. It should be noted that task performance for each participant appears low due to the amount of problems possible to complete during the eight minute task (e.g., percent correct is out of the total number of problems, and not all students were able to attempt all problems due to time limits). This indicates that the task not only assesses accuracy, but fluency as well. The performance for the four participants is shown in Figures 5 through 8. For each participant (Corey, Mia, Madison, and Draven), there was a change in their task performance as a result of receiving either ability- or effort-based praise for the tiered mathematical tasks. It was hypothesized that students who received effort-based praise would perform better on the task than when provided ability-based praise. Based on the overall average performance of all participants during the effort-based praise condition, the participants’ performance decreased 6.64% compared to the control condition. Based on the overall average performance of all participants during the ability-based praise condition, the participants’ performance decreased 3.3% compared to the control condition. Based on the overall performance averages on tasks below the participants’ performance level, when compared to the control conditions, the participants’ performance decreased 15.93% when given ability-based praise and decreased 0.9% when given effort-based praise. Based on the overall performance averages on task at the participants’ performance level, the participant’s performance decreased 8.04% when given ability-based praise, and decreased 14.41% when given effort based praise.
Based on the overall performance averages on task above the participants’ performance level, the participant’s performance increased 0.18% when given ability-based praise, and decreased 2.46% when given effort based praise. These results would not support the previously stated hypothesis that students who received effort-based praise will perform better on the task than when provided ability-based praise, specifically when the task is at and above the student’s current performance level. It was hypothesized that student’s performance on below performance level task, will not change when provided with ability- or effort-based praise. This was not supported due to the overall average performance decreasing when compared to the control condition average when given ability- and effort-based praise. According to Gottfried et al (2005), students’ academic motivation and IQ are not always positively correlated, which highlights concern for students identified as gifted and their underachievement. Although the reasons for the students’ decreasing performance are unknown and warrant future research, it is possible that they were not motivated to complete the task to the best of their ability.

Both female students’ performance decreased when provided effort-based praised when compared to the overall sample of conditions (below, at, and above). Madison’s performance did increase when comparing the control below ability level condition with the effort-based praise below ability level (+8.09%). This finding does support Deci et al (1999) research that suggests female students react more positively to effort-based praised in regards to task performance. Mia’s task performance also decreased when compared to the control condition when provided ability-based praise and effort-based praise. Based on Mia’s and Madison’s performance, effort-based praise did have a more positive reaction than ability-based praise. Based on the results regarding the female participants’ performance, the hypothesis would be supported, due to the effort-based praising having a more positive reaction on task performance.

Although Corey’s performance varied between conditions, Corey did perform better on two out of the three conditions in which ability-based praise was given (below ability level and above ability level). Corey’s performance also decreased on two of the three effort-based conditions. This is consistent with previous research conducted by Deci et al (1999) that suggests male students respond negatively to effort-based praise.

In conclusion, when summarizing task persistence for the four participants (Corey, Mia, Madison, and Draven), there was a change in their task persistence, when compared to the control condition, as a result of receiving either ability- or effort-based praise for the tiered
mathematical tasks. Overall, all four of the participants demonstrated an average decrease on task persistence when provided ability-based praise. It’s important for educators to know that previous research suggests that ability-based praise is thought to encourage performance goals, rather than mastery goals (Mueller & Dweck, 1998).

When summarizing task performance for the four participants, three of the four participants’ performances decreased with both the use of ability- and effort-based praise. Based on the overall average when compared to the control conditions, one of the four student’s performance increased with the use of ability-based praise. This is useful information for educators, because it allows them to understand that praise occurring at a fast rate (losing spontaneity) can actually decrease a student’s performance.

Limitations

The present study is not without limitations. Previous research indicated that verbal praise, when sincere and spontaneous, results in increased intrinsic motivation. However, the results in this study were not consistent within the participants. This could be due to the novelty of the research condition, in which the students were placed in a small group and group praise was given every thirty seconds during the eight minute assessment. A limitation involved in this kind of setting could be that group praise was given; therefore the participants did not view the praise as sincere and spontaneous. A second limitation is the timing of the praise. When a praise statement is given every 30 seconds within the eight minute assessment, the participants can begin to understand a pattern of statements, thus causing the spontaneity of the statements to diminish. A third limitation is the small participant size. With the small sample size, the external validity of the experiment and results could be questioned. A fourth limitation is that the students might not have viewed the tasks as exciting; therefore, the participants might have been unmotivated to complete the tasks to their greatest ability. A fourth limitation is the lack of racial/cultural differences within the participants. This study was conducted with four participants, and all four participants attended the same school district and were Caucasian. It is unknown how well the results would generalize to more diverse samples. A fifth limitation is that using the MCOMP to measure mathematical ability narrows the definition of math. The MCOMP measures math computation, fluency, and accuracy; however, it does not measure math problem solving skills.

Implications
Educators are consistently searching for new ways to foster their students’ academic engagement through motivation. Although this study examined if there was a difference in students with giftedness in mathematics on task performance and persistence on a tiered mathematical (e.g., Below, At, and Above the student’s capability level) task after receiving either ability- or effort-based praise, the results lack external validity. Future research should continue to investigate the affect of praise with gifted students based on task difficulty. The current study could be considered a pilot study. It is suggested that future studies include more trials for each condition with a larger and more diverse sample. This might allow educators to better understand how praise types affect more students within the classroom, based on age, gender, race, and social economic status. Second, it is suggested that future research examine differences of providing individual praise types to students in a one-on-one setting, rather than in a small group setting. It may be that student will respond differently based on the verbal praise if it is provided to the group or individually when working on a task at different academic levels. Third, self-efficacy is a dependent variable that might be beneficial for future research to investigate. By investigating this variable, it might provide insight to how students respond differently to praise types. A student’s performance and persistence may change, should they have higher or lower levels of self-efficacy. This information would be beneficial for educators when delivering praise types to students within their classroom. Educators need to be aware of previous research that suggests student’s intrinsic motivation can increase when provided verbal praise that appears to be sincere and spontaneous. The current study’s results were inconsistent during the praise conditions, which could have been caused by the student’s reaction to the delivery of the praise type. It would be beneficial for educators to understand how their delivery of verbal might be perceived when looking at ways to motivate their students.
REFERENCES


Figure 1. Task persistence for Corey. Task persistence was reported as the percentage of time the student is on task using the Behavioral Observation System.

Figure 2. Task persistence for Mia. Task persistence was reported as the percentage of time the student is on task using the Behavioral Observation System.
**Figure 3.** Task persistence for Madison. Task persistence was reported as the percentage of time the student is on task using the Behavioral Observation System.

**Figure 4.** Task persistence for Draven. Task persistence was reported as the percentage of time the student is on task using the Behavioral Observation System.
Figure 5. Task performance for Corey. Task performance was measured by the percentage correct on each task the participant engaged in.

Figure 6. Task performance for Mia. Task performance was measured by the percentage correct on each task the participant engaged in.
Figure 7. Task performance for Madison. Task performance was measured by the percentage correct on each task the participant engaged in.

Figure 8. Task performance for Draven. Task performance was measured by the percentage correct on each task the participant engaged in.
Appendix- A
Informative letter to principal regarding the proposed study

Dear Mrs. Leazer,

My name is Jessica Schmidt, and I’m currently completing my internship with Clermont County. Miami University’s School Psychology program requires all students to complete a thesis. I’m currently seeking participants for thesis, and I thought Brantner Elementary would be a good fit.

The purpose of this study is to examine if any differences exist among mathematically gifted students on task performance and task persistence on a tiered mathematical task after receiving either ability- or effort-based praise, and if there is a difference in their intrinsic motivation between the tiered mathematical tasks. Through examining these variables, I hope to gain a better understanding of intrinsic (internal) motivating factors in gifted students and find ways that could help teachers motivate gifted students who are underachieving intellectually.

In conducting my research I will be asking students to complete AIMSWeb Mathematics Computation assessments (M-COMP) at the student’s current instructional level and then comparing this baseline data across six separate experimental conditions which will range in M-COMP difficulty (below and above their instructional level) and include ability-based or effort-based verbal praise. Each testing session will be Thirteen minutes in length per student and I am hoping to be allowed nine different testing days to carry out my data collection. Also, it is my preference to complete this study with approximately 4 to 7 different students.

I would certainly appreciate an opportunity to meet with you to discuss my research in greater depth and the possibility of collecting data at Brantner Elementary. If you have any questions or concerns regarding my research, you can reached at (513) 312-7947 or by email at schmid12@muohio.edu.

Sincerely,

Jessica Schmidt, M.S.
Department of Educational Psychology
Miami University
Appendix- B

Consent

Dear Parent:

My name is Jessica Schmidt and I am a School Psychology graduate student at Miami University. I am currently working with Dr. Stuart Watson on a study looking at the effects of various types of verbal praise on gifted student’s motivation.

Your son or daughter is invited to participate in this study on increasing student’s intrinsic motivation by using verbal praise. I will be asking your son or daughter to participate in a few academic activities that involve solving mathematical word problems. He/she will be receiving various types of verbal praise and feedback as a means of motivating him/her. All sessions should take approximately 15 minutes, and each session will occur on 9 different days during the student’s recess. His/her name will not appear on any protocols or research reports. Instead, code names will be used for reporting purposes. His/her participation is voluntary and he/she may withdraw from the session at any time or refuse to answer any questions that make him/her uncomfortable. He/she will not be asked to do anything that exposes himself/herself to risks beyond those of everyday life. The benefit of the study, scientifically, is it will help educators learn techniques to aide in motivating gifted students in the classroom.

If you have further questions about the study, please contact (Jessica Schmidt) at (513-312-7947, schmid12@muohio.edu). If you have questions about your student’s rights as a research participant, please call the Office of Advancement of Research and Scholarship at (513) 529-3600 or email: humansubjects@muohio.edu. If you would like to speak to the advisor of this study, please contact Dr. Watson at (513) 529-0173 or email: Watsonts@muohio.edu

Thank you for your participation. We are very grateful for your help. A copy of the sign permission slip will be mailed to you, once it is returned.

I agree to allow my son/daughter to participate in the study looking at ways to increasing intrinsic motivation in students. I understand their participation is voluntary and that my child’s name will not be associated with their responses.

Parent’s signature _______________________________     Date____________________

**For research purposes each session is to be videotaped for session evaluation and scoring. If you are willing to have your student videotaped with the examiner, please indicate below. The videotapes are used for research purposes only and the tapes will not be shown or viewed outside of the School Psychology program. I grant my permission and allow my son/daughter to be videotaped during the 9 research sessions.

Please sign your name ____________________________ Date ________________
Appendix- C

Assent

Dear Student:

You are invited to participate in a study that looks at ways to increasing student’s motivation. I will be asking you to participate in a few academic activities that involve you solving math problems. There will be a total of 9 sessions, all of which should take approximately 13 minutes during recess. Your participation is voluntary which means that you can choose not to participate at any time. If you have any questions, feel free to ask them now.

Thank you for your participation. We are very grateful for your help and hope that you will find your time working with me fun and enjoyable. A copy of this page will be sent home for your parents to keep.

************************************************************************

I agree to participate in the study looking at ways to increase motivation. I understand my participation is voluntary and that my name will not be associated with any response.

Student’s signature _______________________________     Date____________________

**For research purposes each sessions is to be videotaped for session evaluation and scoring. If you are willing to be videotaped with the researcher, please indicate below. The videotapes are used for research purposes only and the tapes will not be shown or viewed outside of the School Psychology program.

I grant my permission to be videotaped during the research session.

________________________________________               Date__________________

Signature
Appendix - D

Behavior Observation System

Name of student: _________________________________________

Date: ____________  Observer: ____________

Target Behavior(s) t1 = ____________  t2 = ____________

Setting:______________

<table>
<thead>
<tr>
<th></th>
<th>Peer</th>
<th>Peer</th>
<th>Peer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>on off</td>
<td>2</td>
<td>on off</td>
</tr>
<tr>
<td>t1</td>
<td>t2</td>
<td>t1</td>
<td>t2</td>
</tr>
<tr>
<td>T</td>
<td>T+</td>
<td>T</td>
<td>T+</td>
</tr>
<tr>
<td>P</td>
<td>C+C</td>
<td>P</td>
<td>C+C</td>
</tr>
<tr>
<td>10</td>
<td>on off</td>
<td>11</td>
<td>on off</td>
</tr>
<tr>
<td>t1</td>
<td>t2</td>
<td>t1</td>
<td>t2</td>
</tr>
<tr>
<td>T</td>
<td>T+</td>
<td>T</td>
<td>T+</td>
</tr>
<tr>
<td>P</td>
<td>C+C</td>
<td>P</td>
<td>C+C</td>
</tr>
<tr>
<td>19</td>
<td>on off</td>
<td>20</td>
<td>on off</td>
</tr>
<tr>
<td>t1</td>
<td>t2</td>
<td>t1</td>
<td>t2</td>
</tr>
<tr>
<td>T</td>
<td>T+</td>
<td>T</td>
<td>T+</td>
</tr>
<tr>
<td>P</td>
<td>C+C</td>
<td>P</td>
<td>C+C</td>
</tr>
<tr>
<td>28</td>
<td>on off</td>
<td>29</td>
<td>on off</td>
</tr>
<tr>
<td>t1</td>
<td>t2</td>
<td>t1</td>
<td>t2</td>
</tr>
<tr>
<td>T</td>
<td>T+</td>
<td>T</td>
<td>T+</td>
</tr>
<tr>
<td>P</td>
<td>C+C</td>
<td>P</td>
<td>C+C</td>
</tr>
<tr>
<td>37</td>
<td>on off</td>
<td>38</td>
<td>on off</td>
</tr>
<tr>
<td>t1</td>
<td>t2</td>
<td>t1</td>
<td>t2</td>
</tr>
<tr>
<td>T</td>
<td>T+</td>
<td>T</td>
<td>T+</td>
</tr>
<tr>
<td>P</td>
<td>C+C</td>
<td>P</td>
<td>C+C</td>
</tr>
<tr>
<td>46</td>
<td>on off</td>
<td>47</td>
<td>on off</td>
</tr>
<tr>
<td>t1</td>
<td>t2</td>
<td>t1</td>
<td>t2</td>
</tr>
<tr>
<td>T</td>
<td>T+</td>
<td>T</td>
<td>T+</td>
</tr>
<tr>
<td>P</td>
<td>C+C</td>
<td>P</td>
<td>C+C</td>
</tr>
<tr>
<td>55</td>
<td>on off</td>
<td>56</td>
<td>on off</td>
</tr>
<tr>
<td>t1</td>
<td>t2</td>
<td>t1</td>
<td>t2</td>
</tr>
<tr>
<td>T</td>
<td>T+</td>
<td>T</td>
<td>T+</td>
</tr>
<tr>
<td>P</td>
<td>C+C</td>
<td>P</td>
<td>C+C</td>
</tr>
<tr>
<td>64</td>
<td>on off</td>
<td>65</td>
<td>on off</td>
</tr>
<tr>
<td>t1</td>
<td>t2</td>
<td>t1</td>
<td>t2</td>
</tr>
<tr>
<td>T</td>
<td>T+</td>
<td>T</td>
<td>T+</td>
</tr>
<tr>
<td>P</td>
<td>C+C</td>
<td>P</td>
<td>C+C</td>
</tr>
<tr>
<td>73</td>
<td>on off</td>
<td>74</td>
<td>on off</td>
</tr>
<tr>
<td>t1</td>
<td>t2</td>
<td>t1</td>
<td>t2</td>
</tr>
<tr>
<td>T</td>
<td>T+</td>
<td>T</td>
<td>T+</td>
</tr>
<tr>
<td>P</td>
<td>C+C</td>
<td>P</td>
<td>C+C</td>
</tr>
</tbody>
</table>

Comments

Child Mean  Probabilities
Total On=_________ %  t1,t2=_________%

Peer Mean

Teacher  Peer
On/TA = ______/______ = _______%  On/P = ______/______ = Total On

VALIDITY CHECK: TEACHER: Please review these estimates of child and general classroom persistence rates and answer the following questions:
Is this estimate of the target child’s behavior close to his/her average? YES NO
Is this estimate of the classroom (peer) behavior close to their average? YES NO
### Setting Codes

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent Seatwork (ISW)</td>
<td>Students are required to remain at station or seat working independently</td>
</tr>
<tr>
<td>Teacher Directed Whole Class (TDWC)</td>
<td>Students are required to remain at station or seat taking notes, listening, or completing exercises as teacher lectures</td>
</tr>
</tbody>
</table>

### Behavior Codes:

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>On Task (on)</td>
<td>Absence of any disruptive code</td>
</tr>
<tr>
<td>Passive off-task (off)</td>
<td>Eyes leaving material, the teacher, or any appropriate instructional stimuli for 3+ consecutive seconds during the 10-s interval.</td>
</tr>
</tbody>
</table>

| Target 1 (t1)               | Ex. Verbal: any instance of vocal noise that was not preceded by raising hand and receiving acknowledgment from teacher. |
| Target 2 (t2)               | Ex. Motor: out-of-seat, touching others                                      |

### Environment Codes:

#### Teacher Attention
- **Positive (T+)**
  - Physical contact: patting, holding arm or hand, sitting on lap.
  - Praise: verbal comments indicating approval
  - Facial expression: smiling, nodding
- **Negative (T-)**
  - Physical contact: grabbing, pushing, touching, shaking
  - Reprimand: critical comments indicating disapproval or redirection
  - Threats: “If-then” statements
  - Facial expression: frowning, “shhh”
- **Neutral (T)**
  - Academic Recognition: An instructional comment is made, “Are you done?”
  - Academic Inquiry: Calling on child for answer or input “What is the answer to...”
  - Nonacademic Comment: A general question or comment, “When did you come back from the office?”

#### Peer Attention (P)
- Positive, negative, or neutral attention, contact, or expression from peer

#### Classroom Consequence
- Delivery of a tangible/token positive (C+) or negative (C-) consequence as part of classroom mgmt. plan (e.g., checkmark, points)

### Functional Assessment

#### Level of Assistance
- **Total Teacher Attention (T+, T-, T, C+, C-)**: Percentage of intervals during which teacher attention or classroom consequences occurred.
- **Positive/Negative Ratio (T+, C+: T-, C-)**: No. of intervals during which positive attention occurred: No. of intervals during which negative attention occurred.

#### Descriptive Analysis

Compare persistence or disruptive behavior (t1, t2) across two different setting events (ISW versus TDWC; reading versus math class) or two settings that vary aversive demand characteristics, such as task difficulty, type of required motor response, number of required responses, task novelty, duration of instructional session, rate of task presentation, task preference or choice, etc.

**Conditional Probabilities**

Review BOS: Given the occurrence of a behavior during a particular observation, what was the likelihood of it being followed by peer or teacher attention? “Followed-by” is defined as occurring within the same or next interval.

- **Probability of teacher attention, given persistence (On/TA)**
  \[
  \frac{\text{#intervals marked On followed by any teacher attention}}{\text{#intervals marked On}}
  \]
- **Probability of peer attention, given persistence (On/P)**
  \[
  \frac{\text{#intervals marked On followed by peer attention}}{\text{#intervals marked On}}
  \]
- **Probability of teacher attention, given target behavior (t1,t2/TA)**
  \[
  \frac{\text{#intervals marked t1 or t2 followed by any teacher attention}}{\text{#intervals marked t1 or t2}}
  \]
- **Probability of peer attention, given target behavior (t1,t2/P)**
  \[
  \frac{\text{#intervals marked t1 or t2 followed by peer attention}}{\text{#intervals marked t1 or t2}}
  \]

Appendix- E

Verbal Praise Statement

Effort Statements

☐ Good work! I can tell you are trying your best
☐ Excellent Job! You must be working hard on this activity
☐ Nice work! You are really trying to figure out those problems
☐ Awesome job! You are almost there, you are a hard worker
☐ Great job! Your hard work is really paying off
☐ I like your effort. You are really working hard to figure out what the answers are
☐ Good work! You are really working hard to solve those problems
☐ Excellent job! I am proud of your hard work
☐ Awesome job! You are really working hard on the activity
☐ Good work! You are putting a lot of effort into finishing that problem
☐ Good work! I can tell you are trying your best
☐ Excellent Job! You must have worked hard on this activity
☐ Nice work! You are really trying to find those words
☐ Awesome job! You are almost finished, you must be a hard worker
☐ Great job! Your hard work is really paying off
☐ I like your effort. You are really trying to figure out the word
☐ Good work! You are putting a lot of effort into solving the problems
☐ Excellent job! I am proud of your hard work
☐ Awesome job! I can tell that you are trying hard on this activity
☐ Good work! You are putting a lot of effort into finishing that problem

Ability Statements

☐ Nice Job! You’re a good problem solver
☐ You are doing great! You have talent
☐ Excellent job! You’re a natural
Wow! You must be really talented

Good work! You’ve gotten really far. You must be a natural

Excellent! You are halfway there, you must be a natural at solving problems

Nice Job! You must be smart to have solved all of those problems

Nice job on that problem, you are really good at this

Great job! You are a talented problem solver

You are doing great! You are a natural at solving problems

Nice Job! You’re a good problem solver

You are doing great! You have talent

Excellent job! You’re a natural

Wow! You must be really talented

Good work! You’ve gotten really far. You must be a natural

Excellent! You are almost finished, you must be a natural problem solver

Nice Job! You must be smart to have solved all of those problems

Nice job on that problem, you are really good at this

Great job! You are a talented problem solver

You are doing great! You are a natural at figuring out problems