The Effects of Indiscriminable Contingencies on the Accuracy and Completion of Homework in Middle School Students with Learning Disabilities

Thesis

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By

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Abstract

The purpose of this study was to examine the effects of indiscriminable contingencies on homework accuracy and completion of middle school students with learning disabilities. A reversal design was utilized to examine the effects of the classwide indiscriminable contingency intervention on the homework accuracy and completion of three students, each of whom had related individualized education program (IEP) goals. Results indicated that the intervention was effective for one participant, somewhat effective for one participant, and ineffective for the third participant. Limitations, directions for future research, and implications for practice are discussed.
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Field of Study

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Table of Contents

Abstract .......................................................................................................................... ii

Acknowledgements...................................................................................................... iii

Vita ................................................................................................................................. iv

List of Tables ................................................................................................................ vii

List of Figures ............................................................................................................... viii

Chapter 1 - Introduction ............................................................................................. 1
   Purpose of the study ..................................................................................................... 22
   Research Questions .................................................................................................... 22

Chapter 2 - Method ....................................................................................................... 24
   Participants .................................................................................................................. 24
   Teacher ......................................................................................................................... 25
   Setting ........................................................................................................................... 27
   Experimenter ............................................................................................................... 27
   Materials ....................................................................................................................... 27
   Definition and Measures of Dependent Variables ..................................................... 29
   Experimental design .................................................................................................. 29
   Baseline ......................................................................................................................... 30
   Intervention ................................................................................................................ 30
   Interobserver Agreement ......................................................................................... 33
   Treatment Integrity ................................................................................................. 33
   Social Validity .......................................................................................................... 33

Chapter 3 – Results ...................................................................................................... 34
   Interobserver agreement ......................................................................................... 34
   Treatment integrity ................................................................................................. 34
   Completion ................................................................................................................. 38
   Bethany ....................................................................................................................... 38
Chapter 4 – Discussion ................................................................. 52
  Research Question 1 ................................................................. 52
  Research Question 2 ................................................................. 53
  Research Question 3 ................................................................. 54
  Limitations and Future research .............................................. 55
  Implications for Practice .......................................................... 57
  Conclusion .................................................................................. 58

References ................................................................................... 60

Appendix A – Data collection Forms ............................................. 64
Appendix B – Reinforcer Menu ..................................................... 66
Appendix C- Training Procedures .................................................. 67
Appendix D- Treatment Integrity Checklist .................................... 69
Appendix E – Social Validity Questionnaire ................................. 70
Appendix F- Homework Samples ................................................... 74
Appendix G-Parent Recruitment Letter ........................................ 80
Appendix H – Parent Consent Form ............................................. 81
Appendix I – IRB Approval Letter ................................................ 84
List of Tables

Table 2.1. Participants Characteristics.................................................................26
Table 2.2. Preference Questionnaire Results ............................................................32
Table 3.1. Interobserver Agreement Information ......................................................36
Table 3.2. Summary of Interobserver Agreement Results ..........................................37
List of Figures

Figure 2.1. Graphic of Spinner .............................................................28
Figure 3.1. Bethany’s Completion Data.......................................................44
Figure 3.2. JC’s Completion Data .................................................................45
Figure 3.3. Warren’s Completion Data .........................................................46
Figure 3.4. Bethany’s Accuracy Data ............................................................47
Figure 3.5. JC’s Accuracy Data .................................................................48
Figure 3.6 Warren’s Accuracy Data ............................................................49
Chapter 1: Introduction

Homework is perceived as valuable by many educational stakeholders including teachers, administrators, parents, and even students themselves (Callahan, Rademacher, & Hildreth, 1998). Government reports have promoted homework as an important component of effective teaching and quality school programs (U.S. Department of Education, 1987). In addition, there is research supporting a linkage between homework and positive student outcomes (Bryan, Burstein, & Bryan, 2001; Cooper & Valentine, 2001; O'Melia & Rosenberg, 1994).

Homework has been operationally defined as tasks assigned to students by teachers that are meant to be carried out during non-school hours (Cooper & Valentine, 2001, p. 145). Homework is believed to teach students to take responsibility, develop character and personal management skills, and to provide supplemental practice, allow for completion of unfinished classwork, and keep parents informed about their children’s progress (Polloway, Epstein, Bursuck, Jayanthi, & Cumblad, 1994). There are many purposes of homework; for students it may serve as practice of newly learned skills, preparation for the next lesson or grade level, personal development, opportunity for collaboration and peer interaction, and even punishment, and for parents it may improve relations with their children and their children’s teachers (Epstein & Van Voorhis, 2001). Additionally, homework may increase student learning, develop home-school-
community partnerships, and improve teaching and administrative practice (Epstein & Van Voorhis, 2001).

**Homework and Academic Achievement**

Students both young and older and with and without disabilities experience problems completing homework. Twenty-eight percent of students in general education settings are estimated to have trouble completing their homework, while 58% of students in special education settings experience difficulties completing their homework (Polloway et al., 1992). Bryan and Nelson (1994) found that students with learning disabilities were less likely to complete homework, expressed boredom and resistance towards homework, perceived themselves as less competent than their peers in completing assignments, and were likely to have negative feelings towards homework.

Although homework assignments should account for 20% of a student’s total time engaged academically (Bryan et al., 2001), the completion of assignments could take substantially longer for students with learning disabilities. These students may spend up to two hours on homework assignments that require their peers only fifteen minutes to complete (Baumgartner et al., 1993). Not doing homework or doing it poorly is likely to affect academic achievement (Bryan et al., 2001). The time spent actively engaged in a learning activity such as homework may be the single best indicator of achievement among students with disabilities (O’Melia & Rosenberg, 1994). Students with learning disabilities who spend less time, or misspend their time on homework are likely to show poorer academic achievement than their classmates (Bryan et al., 2001).
Homework and Learning Disabilities

Salend and Schiff (1989) surveyed teachers of students with learning disabilities and found that nearly half of them did not discuss or review homework, did not regularly grade the homework, and did not use the homework performance as a basis for determining grades on report cards. Only six percent of 88 teachers of students with learning disabilities reported no problems assigning homework (Salend & Schiff, 1989). Teachers’ most common complaints concerning homework are students’ noncompliance and inaccurate completion of assignments (Kahle & Kelley, 1994). Homework may be a source of stress for students and teachers alike.

Research on Homework Interventions

Given its influence on academic achievement, improving homework completion and accuracy presents a valuable topic for investigation. Many studies have examined the effects of interventions targeting homework and academic achievement. In a study conducted by Cooper and Valentine (2001), there was a strong relationship between grade levels and overall outcome the homework had on achievement. That is, the difference homework made on academic achievement for students in high school was more than two times larger for those in middle school and four times larger for those in elementary school. In sum, homework has a positive effect on achievement, but the effect varies dramatically with grade level. For high school students, homework has substantial positive effects. Junior high school students also benefit from home, but only about half as much. For elementary students, the effect of homework on achievement is negligible (Cooper, 1989). Cooper (1989) also discusses that grade level also affects the amount of
homework affects achievement. For elementary students, no amount of homework (large or small) affects achievement. For junior high school students, he recommends that achievement continue to improve with more homework until homework lasts between one to two hours per night. For high school students, Cooper (1989) recommends the more homework, the better (up to a couple hours a night).

There have been a number of research studies targeting homework compliance. Several intervention strategies have been demonstrated to be effective in improving homework compliance including, in isolation or conjunction, self-management and student mediation, parent mediation, and reinforcement and contingency management.

**Student-Mediated Strategies**

Self-management and student mediated strategies are prevalent in the literature on homework interventions. Self-management refers to the personal application of behavior change tactics that produce a desired change in behavior (Cooper, Heron, & Heward, 2007).

Five studies since 1985 utilizing self-management strategies and packages to improve student’s homework performance were identified. Piersel (1985) utilized self-observation and self-charting to improve an 8-year-old’s completion of class assignments. Data were collected across seven classroom settings, and the dependent measures were assignment completion and accuracy. The intervention began with the participant meeting weekly with the school psychologist and self-monitoring procedures. Subsequent meetings included discussion of the technical
aspects of completing the chart, progress, and the importance of completing homework assignments. The results of this study indicated that self-observation and weekly meetings improved homework performance in an elementary aged student.

Following procedures similar to Piersel (1985), Fish and Mendola (1986) examined the effectiveness of self-instruction training on the percentage of homework assignments completed by three children who received special education services for mild disabilities. Training was conducted with participants individually and first consisted of the experimenter modeling the desired behavior, the participant completing the task while the experimenter vocalized the steps to complete it aloud, next participant performed the task himself and vocalized the steps himself, then the participant did the task and whispered the steps to himself, and finally participant was told to repeat the words silently to himself as he completed the task. Using a multiple baseline design across participants, the authors demonstrated self-instruction to be a successful intervention for improving homework completion of elementary aged students in special education.

Glomb and West (1990) utilized a self-management strategy (i.e., an acronym) to improve the completeness, accuracy, and neatness of homework in two high school students with emotional behavioral disorders. Using the acronym WATCH as a prompt, students were instructed to Write down an assignment when it is given along with its due date, Ask for clarification or help on the assignment if needed, Task-analyze the assignment and schedule the tasks over the days available to complete the assignment, and Check all work for completeness, accuracy, and neatness. Data were collected on creative writing. The experimenters employed a
multiple baseline design across participants. During the first phase, the experimenter individually rated how well the participants followed the acronym and met the performance criteria, and the participants gave themselves points for the tasks in their planner. Next, the two ratings were compared. If the two numbers matched exactly, the participants received the number of points they awarded themselves plus one bonus point. If the number of points was within one (i.e., “next door” match), the participants received the rating the experimenter gave them. If the ratings were more than one point apart, the students received no points that day. Participants moved on to phase 1/matching condition 2 where they accomplished exact or next-door matches on three consecutive school days. During this condition, experimenter and participant matched points on two days a week. The results suggested the self-management acronym was effective in improving homework completion, accuracy, and neatness for one participant and moderately effective for the other participant.

Trammel, Schloss, and Alper (1994) used self-monitoring procedures to increase the number homework assignments completed by secondary students with learning disabilities. For each day and each subject, the participants recorded whether they completed and turned in their homework (X), did not complete or turn in their homework (I), or there was no assignment (O). The participant brought the self-monitoring card to their resource room teacher and received verbal praise and a piece of bubble gum for completing their homework. After the self-monitoring phase, the participants were introduced to a self-graphing and goal
setting phase. Results of this study suggest that the self-management package was effective in improving homework compliance.

Falkenberg and Barbetta (2013) used a self-monitoring package on the completion and accuracy rates on math and spelling homework of 4 fourth-grade students with disabilities. Prior to baseline, all participants received tips from the experimenter to complete homework. Within the tips packet, was the self-monitoring sheet. Researchers used a multiple baseline across participants design. Before beginning baseline, the participants received training on the tips. After baseline, the teacher trained each participant on self-monitoring procedures. Participants were taught to log onto the computer, fill out the practice self-monitoring sheet, give an explanation or demonstration of each item, and answer the questions on the monitoring sheet independently. The intervention consisted of three components: self-monitoring sheet at home with parent initialing, self-monitoring at school on the computer, and a brief conference with the special education teacher. Researchers began to fade the intervention after high rates of responding. Overall, the results suggest that the self-management package was an effective intervention in improving the completion and accuracy of spelling and math for students with disabilities in an inclusive general education setting.

**Parent-Mediated Strategies**

Researchers have found that parents can also be useful agents for changing their children’s problematic homework behavior. Goldberg, Merbaum, Evan, Getz, and Safir (1981) trained mothers in operant conditioning techniques to improve the number of assignments their children turned in. Sixty-five children participated in
this study. After baseline, the mothers were randomly assigned to operant, psychotherapy, feedback, or control. The results indicate that the operant group was the most effective, the feedback group attained better performance than the psychotherapy and control groups.

Anesko and O’Leary (1983) examined the effects of a brief parent training on the homework behavior on 13 children. Parents were assigned to either the treatment condition where they received the training or wait-list control group. The format of the workshop entailed discussion of the material and direct practice of techniques via modeling. Results indicated that group-training approach was successful in producing significant changes in child and parent behavior when compared to no treatment.

**Reinforcement Strategies**

Another useful intervention to improve homework compliance is reinforcement and contingency related strategies. Reinforcement strategies have been used to improve homework since 1969 when Cantrell, Cantrell, Huddleson, and Wooldridge used contingency contracting to improve school behaviors (e.g., homework, class assignments, listening and complying to directions, etc.). The contingency contract contained a written schedule of desired behaviors and a written schedule of high probability behaviors with assigned exchange values(points). Next, the authors identified the problem behaviors and identified reinforcers and the contingency contract was created. The participant had the opportunity to earn points for completing his homework, assignments, following directions, and starting his homework with no warnings. Additionally, the
participant earned an additional 5 bonus points for doing his homework and class assignments well. He had the opportunity to exchange the points for outdoor time, television time, cooking privileges, driving, going out, staying with a friend overnight, and money. Authors reported the intervention was very socially valid, effective, and was referred other cases for similar treatment.

Harris and Sherman (1974) provided reinforcing consequences for accurate homework in two sixth grade classrooms. Everyday, students were given a reading assignment as homework, and they were told read it and be prepared to answer questions about it the next day. Fifteen compete-the-sentence questions from the previous day’s reading were presented at random order. Participants were instructed to answer the questions as quickly as they could, turn their sheet over, and raise their hands. The team with the most correct answers got to start with the tic-tac-toe game. During the homework questions versus no homework questions phase, researchers compared the effects of homework questions on the accuracy of question answering of the tic-tac-toe game. There were several phases of the study examining contingencies for accuracy and completion of homework, such as leaving 10 minutes early when 80% of homework was complete and leaving 15 minutes early when 80% of homework was accurate. Additionally, researchers examined whether homework affected performance on the game. Data suggests that percentages of homework compete in both classrooms were higher when homework was assigned. Harris and Sherman (1974) authors conducted a second study in 1 sixth grade math classroom. Procedures utilized in this study were similar to that in the previous study apart from leaving early, the students got to go to lunch
early. Leaving school early or going to lunch early appear to be effective consequences in increasing the number of students completing their homework assignments as well as improving their accuracy on these assignments.

Hancock (2000) examined the effects of verbal praise on homework compliance in college students. Each student was randomly assigned to one of four treatment groups. Each participant received a “Time Spent on Homework” log and was asked to record how much time spent preparing for selected lessons. During no praise treatment conditions, the instructor simply said “thank you” to the participants when they turned in their log. During praise conditions, the instructor enthusiastically said “good job”, “very good”, or “great work”, when the participants turned in their log. At the end of the term, the average amount of time spent on homework lessons for each condition was calculated. In the no verbal praise condition, participants spent a total of 510 hours on homework, in the verbal praise condition, participants spent 527 hours on homework. Authors suggested that the difference was statistically significant.

Ryan and Hemmes (2005) examined the effects of the contingency for submission of homework and performance on quizzes in a college behavior analysis course. The instructor provided affirmative and corrective feedback on homework during the class session following the assignment submission. Experimenters utilized an alternating treatments design to demonstrate experimental control. Mean percentage of homework assignments was higher for all chapters in which points were awarded and declined to near-zero levels when no points were awarded. Quiz performance was higher in the points condition for 10 of 10 chapters
for which experimental manipulation was in effect. Authors completed a direct replication and attained similar results (Ryan & Hemmes, 2005).

Combined Strategies

Researchers have combined two or more effective strategies utilizing self-management, parent mediated, and reinforcement and created a robust treatment package to improve homework compliance. Kahle and Kelley (1994) compared the effects of goal setting and parent training with 40 elementary students (males=29, females=11) and their families. Each family received one of four treatments, either goal-setting treatment, parent training treatment, monitoring control, or no-contact control. The goal setting treatment consisted of scheduling a homework routine, dividing homework into small, specific goals with a time limit, and setting an accuracy criterion. A reward menu was negotiated for each participant. Experimenters gave feedback, addressed problems, and offered help with the goal setting group. The parent training treatment group involved teaching parents to schedule a place to complete homework and having families identify the two most problematic behaviors related to homework (e.g., sloppy work, production, off-task behavior, procrastination, excessive requests for help, and careless mistakes). Experimenters created operational definitions, requested the parents to collect data on these behaviors, and parents were asked to monitor their responses (positive and negative) to homework on a form. Next, experimenters taught parents how to provide specific praise, provide contingent reinforcement, and how to use extinction. The monitoring control group entailed the parents filling out the questionnaires, and the experimenter invited them to discuss treatment options.
The no-contact control group did not fill out questionnaires and did not have the opportunity to discuss treatment options with experimenters. The results of this study suggest that the parent training and goal setting produced the most sizable effects, but the monitoring control condition produced notable effects as well.

Miller and Kelley (1994) assessed the effects of goal setting and contingency contracting to improve homework performance in parent-child dyads. A combination of reversal (ABAB) and multiple baseline across participants research designs was used in this intervention. Following baseline, each parent-child dyad was instructed to discuss what materials were necessary to complete the homework assignments for that night. Parents and children were taught how to divide the homework into small and specific tasks and agreed upon a goal. Each week the dyad negotiated daily and weekly rewards contingent on completing homework and bringing home the necessary materials. On-task behavior and accuracy of assignments improved for all four participants involved in the study. Results showed mixed effects, reflecting notable improvement for two of the four participants.

Bryan and Sullivan-Burstein (1998) conducted three studies examining the effects of reinforcement, homework planners, and self-monitoring on the homework completion on 123 students with and without disabilities. The first study (Bryan & Sullivan-Burstein, 1998) included four groups of participants, including children with learning disabilities who demonstrated homework problems, children with learning disabilities who did not demonstrate problems with homework, typically developing children who have homework problems, and typically developing
children who did not have homework problems. After collecting baseline data, teachers continued to assign homework but gave their student a reward if they turned in their assignments for that week. For the next three weeks, teachers gave students “real-life” assignments that were related to the unit being taught. The last phase of the intervention was real-life homework plus rewards. The results indicate that the typically developing children outscored their peers; however, the intervention increased homework completion and test performance for all students. The second study (Bryan & Sullivan-Burstein, 1998) assessed the effects of homework planners in the same population of students. Teachers trained the participants on how to use the homework planner, and parents received notifications from the principal and teachers and were encouraged to sign their child’s homework and send messages via the planner. The data suggest the homework planner was successful in improving homework completion with students who had homework problems (both typically developing and those with learning disabilities). The authors implied that there was not a large effect with average achieving children because their baseline performance was high and thus was a potential ceiling effect. The third study (Bryan & Sullivan-Burstein, 1998) examined the effects of self-monitoring (graphing) on homework in the same group of participants used in the first two studies. After baseline data were collected, students were taught how to graph their math and spelling homework performance. Students colored their graph red (not turned in), green (completed and turned in) and yellow (completed but late). Their teacher did a spot check for accuracy at the end of the week. Graphing resulted in significant increases in spelling homework
performance and produced positive effects on math homework performance. Additionally, students were able to participate in parent-teacher conferences by showing their graphs and their progress to their parents.

Callahan, Rademacher, and Hildreth (1998) evaluated the effects of a parent facilitated self-management and reinforcement treatment package on the homework completion and quality of 26 middle school at-risk participants. The authors utilized a multiple baseline across groups design. The intervention consisted of training the parents and participants utilizing self-management procedures as well as positive reinforcement. Parent monitoring and checking of homework, the students received their homework, a student checklist, and matching sheet were implemented across intervention phases. The matching procedures involved self-monitoring, self-recording, self-reinforcement and self-instruction and goal setting. The reinforcement component of the intervention was set up so the participant would receive reinforcers in the school and home setting. The authors suggested that once the intervention was introduced, homework quality and completion improved significantly; however, post-intervention levels may not have produced socially significant results.

Toney, Kelley, and Lanclos (2003) compared the effects of two treatments on homework in 37 middle school students. One package involved parents monitoring homework completion, and the other consisted of the participant self-monitoring the homework activities. There was also a wait list control group to demonstrate experimental control. Post-scores on the homework problems checklist decreased significantly for both the parental and self-monitoring conditions, these
improvements maintained for two weeks after the intervention was terminated in both groups, and parents rated both treatment groups positively.

Canico, West, and Young (2004) examined the effects of self-management and parent participation on homework completion, homework accuracy, academic achievement and the parent/teacher perceptions of homework problems of participants with emotional behavior disorders and learning disabilities. Baseline levels for completion and accuracy of homework for all participants were very low. Once the intervention was introduced, the authors noted high averages of assignment accuracy and completion. Ratings on the Homework Problems Checklist dropped substantially for both parents and teachers, and on the academic achievement assessment, students attained an average increase of a whole grade level in approximately four months.

In addition to parent and self-mediated intervention and contingency based interventions, several other interventions have been successful in improving homework compliance including daily report system, mnemonic devices, and conjoint behavioral consulting. Dougherty and Dougherty (1977) examined the effects of the daily report card system on a fourth grade class who exhibited behavioral and homework problems. Researchers used a multiple baseline across behaviors (homework completion and talk-outs). A letter was sent home to the parents describing the report card and making suggestions of its use. These suggestions included reviewing the card with their child, reinforcing good reviews, and discussing ways to improve the poor ratings. Baseline levels of non-completed homework and talk outs were relatively high and levels decreased after the
intervention was introduced. The Daily Report Card system had an immediate effect on talk outs and homework completion.

Weiner, Sheridan, and Jenson (1998) assessed the effects of conjoint behavior consulting (CBC) with five participants. Researchers used a multiple baseline across participants design to demonstrate experimental control. CBC is comprised of four stages that included problem identification, problem analysis, treatment implementation, and treatment evaluation. The intervention used in the study was a structured homework compliance and reinforcement program that was implemented in the home and school settings involving self-monitoring, contingent feedback, rules, and contingent reinforcement. The authors suggested that the intervention made improvements in homework and completion among the majority of students. CBC may be an effective treatment in improving homework compliance in children with homework problems.

Hughes, Ruhl, Shumaker, and Deshler (2002) evaluated the effects of a mnemonic device on homework completion rates and the quality of homework on nine middle school students with learning disabilities in an inclusive classroom. The mnemonic device used in this study was PROJECT which stood for Prepare your forms, Record and ask, Organize: Best, Estimate the number of study sessions, Schedule the sessions, Take your materials home, Jump to it, Engage in the work, Check your work, Turn in your work. In addition, participants received a monthly planner, a week-at-a-glance calendar, and assignment-recording sheet. Generalization measures were assessed in the general education classroom. Baseline rates for six participants were very low, and once the intervention was
introduced their performance increased rapidly. Five of the six participants show maintenance effects when the intervention was withdrawn. The results of this study indicate that the intervention was successful in improving homework compliance in six students with learning disabilities.

**Indiscriminable Contingencies**

Indiscriminable contingencies are ones in which the learner cannot distinguish whether the next response will produce reinforcement (Cooper et al., 2007). An indiscriminable contingency is a useful tactic for promoting generalization and maintenance. It includes arranging a contingency in which reinforcement is delivered on some but not all occurrences of behavior, and the learner is unable to predict which response will produce reinforcement. There are two procedures related to indiscriminable contingencies: intermittent reinforcement and delayed rewards.

Many studies have validated the use of indiscriminable contingencies across a wide range of behaviors including decreasing undesirable behaviors such as socially inappropriate behaviors like face-touching, poor posture, and loud volume of talking (Shwarz & Hawkins, 1970), disruptive behaviors (Murphy et al., 2007), and off-task, out of seat, and inappropriate vocalizations (Shanding & Sterling-Turner, 2010) and increasing desirable behaviors such as prosocial behaviors like playing cooperatively, actively praising, making conversation, and sharing (Fowler & Baer, 1981) and improving bedtime compliance (Robinson & Sheridan, 2000).

Schwarz and Hawkins (1970) used delayed reinforcement to decrease socially inappropriate behaviors in a typically developing sixth grader.
Experimenters used a multiple baseline across settings to demonstrate experimental control. The participant’s target behaviors included: size of writing in mathematics (too small), face touching, posture, and volume of voice. To modify these target behaviors, the experimenters inconspicuously recorded the participant for approximately 20 minutes twice a day (during mathematics and spelling). Once baseline data were collected, the participant entered the intervention phases. During the first experimental phase, the participant met with the experimenter and was shown the video. Modification of face touching was selected first; tokens were given administered for the absence of the target behavior for the duration of a time interval, gradually increasing. This pattern was repeated until all target behaviors were covered. During the experimental phases, reinforcement was contingent on the behavior on the television monitor (i.e., delayed reinforcement). That is, the behavior had to not be emitted for a criterion (e.g., 10, 15, 30 seconds) to receive reinforcement. The results suggested that delayed reinforcement was successful at decreasing the three target behaviors rapidly, as well as generalizing in an untaught setting.

Fowler and Baer (1981) examined the comparative effects of early reinforcement and late reinforcement on the generalization of social behaviors across classrooms in seven preschool children. Early reinforcement meant that the reinforcer was delivered immediately the setting in which the critical behavior had occurred and Late reinforcement meant that reinforcement was delivered after several further settings had been encountered (i.e., at the end of the day). The
results of the study suggest that the delayed reinforcement was an effective way to promote generalization for all participants.

Murphy, Theodore, Alosio, Alric-Edwards, and Hughes (2007) used interdependent group contingencies and the mystery motivator to reduce disruptive behaviors in eight preschoolers. Researchers utilized an ABAB reversal design to demonstrate experimental control. Students were informed they needed to earn five or less checks (i.e., unwanted behaviors) to earn a reinforcer (e.g., games, free time, stickers, books, pencils, puppet show). Students were provided with reminders of the rules at the beginning of an activity and were notified whether they met the criterion to earn a reward at the end of the activity. If they met the criterion, one reward was randomly selected from the mystery motivator box. The results of the study suggest that interdependent group contingencies and random reinforcers significantly reduced disruptive behaviors in a Head Start preschool classroom.

Schanding and Sterling-Turning (2010) assessed the effects of the mystery motivator on decreasing challenging behaviors of three high school students. The authors utilized a reversal (ABAB) design to demonstrate experimental control. The dependent measures in this study were problematic behaviors, which included off-task, out of seat, and inappropriate. Students were introduced to the intervention. They were told if they followed the three classroom rules (i.e., pay attention and do work, stay in your sat, and be quiet) they would have the opportunity to earn the reinforcer in the envelope. The data suggest that the mystery motivator was successful in improving the three students problem behavior. In addition to
improving the target participant’s challenging behavior, the class wide average problem behavior (i.e., student’s who did not participate in the study) improved with the introduction of the intervention.

Robinson and Sheridan (2000) applied the mystery motivator to improve bedtime compliance in four children. The dependent measures used in this study were bedtime noncompliance; parent acquired knowledge, and acceptability. Researchers utilized a multiple baseline across participants design to demonstrate experimental control. If the child had less than 10 minutes out of bed recorded during the night before, then the participant chose one reinforcer from the grab bag the next morning. The schedule of reinforcement was relatively denser at the beginning of the study and leaned out after a few weeks. The results of the study indicate that the mystery motivator was an effective intervention for improving bedtime compliance in three of the four participants.

Indiscriminable contingencies have been successful in improving challenging behaviors from preschools to high schools and improving bedtime compliance; additionally, indiscriminable contingencies are also useful interventions to improve homework compliance. Two interventions have used indiscriminable contingencies to improve homework compliance with students who have difficulty completing their homework and turning it in on time.

Moore, Waguespack, Wickstrom, Witt, and Gaydos (1994) examined the effectiveness of the mystery motivator on the homework completion across nine participants in a third and fifth classroom. The indiscriminable contingency used in this study involved a mystery motivator chart and markers that made invisible ink
appear. The students were told that if they turned in all their homework for the day, they had the opportunity to color in one square of the chart. Some squares had invisible symbols on them. If the student got the symbol, they were allowed to choose from a reinforcer menu. If no symbol appeared, then they did not have the opportunity to earn a reinforcer that day. The schedule of reinforcement was relatively dense (i.e., four of the five squares had invisible symbols in them). The results of the study were moderately effective. As a whole, the data for many of the participants were quite variable in both or one of the conditions. When the researchers averaged homework completion and accuracy scores across conditions; however, the treatment effects were more apparent. The authors suggest that the mystery motivator was an effective and acceptable intervention in improving homework accuracy and completion.

Madaus, Kehle, Madaus, and Bray (2003) also used a mystery motivator to improve homework completion and accuracy in 5 fifth grade students. The authors employed a multiple baseline across participants with an embedded reversal (ABAB) design to demonstrate experimental control. The dependent measures used in this study were homework completion and homework accuracy. Students were given their own mystery motivator chart. The rules of the chart were: homework must be turned in upon arrival to class, students must score at least 20 problems correct (out of 25), if students get the first two above, lift the tab, if there is an 'M' beneath the tab, you earn what is in the envelope. Results of the study indicate that of the five participants, four showed an improvement completing their mathematics
homework when the intervention was in place. Three out of the five participants showed improvements in the accuracy of their homework.

Purpose of the Study

The purpose of the current study was to evaluate the effectiveness of a class-wide intervention using indiscriminable contingencies on the accuracy and completion of homework in middle school students with learning disabilities.

The goal of the current study was to examine the effects of indiscriminable contingencies on homework completion and accuracy in two ways: first to expand the intervention with a special education population (where Madaus et al. 2003 used a general education population), and second to administer a preference questionnaire in the beginning of the intervention to attain socially significant gains (because Moore et al. 1994 did not use a preference assessment and did not attain socially significant gains). Madaus et al. (2003) used the mystery motivator classwide but in a general education population. This study will expand the literature to a population that struggles to complete their homework (Polloway et al., 1992) (i.e., individuals with learning disabilities). This study was implemented class-wide, but targeted students who struggled to complete their homework (similar to Moore et al, 1994.).

A major limitation of Madaus et al. (2003) was that not all participants made meaningful gains from the intervention. This intervention addressed that limitation by ensuring that participants were contacting the powerful reinforcers by lowering the responses requirements then gradually increasing the requirements. Madaus
and colleagues introduced response requirements (accuracy of 80%) that may have been too difficult or interfered with other competing behaviors.

Finally, Moore and Waguespack (1994) mention that interventionist should administer a reinforcer assessment but do not refer to using one in their study. Madaus et al. (2003) do not mention any reinforcer assessment. Lack of positive results in the Madaus (2003) study could be explained because the reinforcers used did not motivate their participants. The current study administered a preference questionnaire to ensure that the reinforcers used were motivated for the participants.

Research Questions
This experiment was carried out and data were collected and analyzed to answer the following questions:

1. What are the effects of indiscriminable contingencies on the completion of homework in students who have learning disabilities in a secondary language arts class?

2. What are the effects of indiscriminable contingencies on the accuracy of homework in students who have learning disabilities in a secondary language arts class?

3. What are the opinions of the teacher and participants on the use of indiscriminable contingencies to improve math homework completion and accuracy?
Chapter 2: Method

The purpose of this chapter is to describe the methods used to complete the experiment. Detailed herein are the participants, setting, experimenter, materials, definition of the independent and dependent variables, experimental design, procedures, interobserver agreement, treatment integrity, and social validity.

Participants

Three eighth grade students diagnosed with specific learning disabilities participated in this study (see Table 2.1). Each of the participants was 14 years old, received special education services, and was referred by the special education teacher due to a history of not completing homework or completing it with poor accuracy.

Bethany. Bethany was diagnosed with specific learning disability in the areas of oral expression, reading comprehension, listening comprehension, written expression, math problem solving, and math calculation. She received modified science and social studies curriculum in a small group, small group instruction in language arts and math, and daily supplemental support targeting individualized educational program (IEP) goals from the special education teacher. In addition, Bethany received speech and language services from a speech and language pathologist.
Warren. Warren was diagnosed with specific learning disability in the areas of oral expression, listening comprehension, oral reading fluency, basic reading skills, reading comprehension, and written expression. His science and social studies classes were team taught by the special education teacher along with a general education teacher in the general education classroom. The special education teacher also provided Warren small group instruction in language arts and math, and daily supplemental support targeting IEP goals. Additionally, he received speech and language services from a speech and language pathologist.

JC. JC was a diagnosed with specific learning disability in the areas of reading comprehension, math reasoning, written expression, oral expression, and listening comprehension. JC received small group instruction in language arts from a special education teacher and received general instruction in math, science, and social studies from a general education teacher. Additionally, JC received speech and language services from a speech and language pathologist.

Teacher

The teacher was a special education teacher certified to teach individuals with mild to moderate disabilities. The teacher had two years of teaching experience prior to entering the research study. The teacher was also a first-year graduate student completing her Master’s of Arts degree in applied behavior analysis.
Table 2.1. Table of participant characteristics. This table shows demographic and diagnostic information about each participant.

<table>
<thead>
<tr>
<th>Name</th>
<th>Diagnosis</th>
<th>Age</th>
<th>Ethnicity</th>
<th>Hours spent in special education environment (in core classes)</th>
<th>Speech Language Services?</th>
<th>Eligible for free or reduced lunch?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bethany</strong></td>
<td>Specific Learning Disability</td>
<td>14</td>
<td>African American</td>
<td>4</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Warren</strong></td>
<td>Specific Learning Disability</td>
<td>14</td>
<td>Somali</td>
<td>4</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>JC</strong></td>
<td>Specific Learning Disability</td>
<td>14</td>
<td>African American</td>
<td>1</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Setting

All experimental sessions were conducted in a small group, special education eighth-grade language arts classroom in a Midwestern suburban school with a student population of approximately 900 students. The classroom was equipped with 15 desks, a white board, a chalkboard, a projector, and two computers. There were 11 students and one special education teacher in the class.

Experimenter

The experimenter was a graduate student pursuing a Masters of Arts degree in applied behavior analysis. She received her Bachelors of Science in Psychology, and worked with individuals with disabilities for five years.

Materials

In order to implement the indiscriminable contingency, the experimenter created a spinner by making a pie chart in Microsoft Word. The experimenter cut out the pie chart and attached it to a piece of cardboard with a round brass-head fastener. The spinner was approximately 10 inches long and ¼ inch thick. Each quadrant was labeled between 1-4. Experimenters did not label one of the quadrants 0 because they did not want to extinguish the participant’s behavior. All of the participants had the fine motor skills to operate the spinner independently. See Figure 2.1 for a graphic description of the spinner. Other materials used in this experiment included data sheets (see Appendix A), clipboards, writing utensils, poker chips and reinforcers (see Appendix B for reinforcer menu).
Figure 2.1. The indiscriminable contingency. This figure illustrates the spinner used in the experiment. Each section was labeled from 1-4.
Definition and Measurement of the Dependent Variables

The dependent variables measured in this experiment were homework accuracy and completion. Homework accuracy was defined as the percentage of items correct on an assignment. It was measured by comparing the student's responses to the teacher's answer key, summing the number of correct responses, dividing the correct responses by the total number of items, and multiplying by 100 to yield a percentage. Homework completion was defined as providing an answer to every question on an assignment, and if specified, showing their work. It was measured by noting whether or not the participant attempted to answer every question on the assignment. This measure was considered binary (complete or incomplete) to spin the spinner, but data were collected on amount of homework completed for the research purposes.

Experimental Design

A reversal design (ABCAC) was used for each participant to determine if the indiscriminable contingencies (i.e., the spinner) were effective in improving homework completion and homework accuracy. The experimental conditions consisted of a baseline (A), introduction of the intervention with the indiscriminable contingency with an accuracy criterion (B), the indiscriminable contingency without accuracy criterion (C), return to baseline (A), and return to intervention without accuracy criterion for a second time (C). A minimum of three data points was required for each phase.

Procedure
**Baseline.** During baseline, data were collected on each participant’s homework completion and accuracy. The students were not informed of the spinner or the associated contingencies. Neutral feedback was given from the experimenter and classroom teacher on homework completion and accuracy (e.g., “Thank you, Kyle, for showing me your homework.”). Prior to returning to baseline, the students were told that they would no longer use the spinner. Neutral feedback was given from the experimenter and classroom teacher on homework completion and accuracy of homework.

**Intervention. Training.** The experimenter provided the teacher verbal and written instructions (see Appendix C) on how to teach the students the procedures for using the spinner. The experimenter then collected data on the teacher’s training of the students (see Appendix D). After the teacher trained the students on the procedures, they began the indiscriminable contingency phase.

**Indiscriminable contingencies and the spinner: accuracy + completion criteria.** The teacher collected the homework that was assigned the night before prior to beginning the lesson each day. The experimenter made two copies of the homework assignments, graded them for accuracy and completion, and saved the other copy for reliability checks. The experimenter returned the following day, and each student who met the 100% completion criterion and the 60% accuracy criterion was permitted to spin the spinner.

If the students met the criteria to spin, they would spin the spinner and receive the number of tokens that the position of the spinner indicated. After each student had the opportunity to spin the spinner, the teacher gave the students the
option of exchanging the tokens for a backup reinforcer or saving the tokens to “purchase” larger reinforcers.

Each participant completed a questionnaire indicating items they would like to earn for completing their homework prior to beginning the intervention. The questionnaire identified a pool of possible reinforcers used in the reinforcer menu. See Table 2.2 for the results of the questionnaire. Reinforcers were made available to all the students in the classroom.

**Indiscriminable contingencies: completion only.** Due to the variability in responding and the low accuracy scores, the accuracy criterion was removed so the participants could contact the reinforcer. For Warren, the accuracy criterion was removed after session eight. For Bethany and JC, the accuracy criterion was removed after the 11th session. On the 11th session, all of the students were informed that there was no longer an accuracy criterion to spin the spinner.
<table>
<thead>
<tr>
<th>Student Number &amp; Name</th>
<th>Item(s) Listed</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1</strong></td>
<td>Sharpie Pen, Gum, Justin Timberlake CD</td>
</tr>
<tr>
<td><strong>2</strong></td>
<td>Store Gift card, candy</td>
</tr>
<tr>
<td><strong>3 <strong>Bethany</strong></strong></td>
<td>Gift cards, iPhone case, Hot Fries</td>
</tr>
<tr>
<td><strong>4</strong></td>
<td>Gift Card, Hot Cheetos</td>
</tr>
<tr>
<td><strong>5</strong></td>
<td>iTunes songs</td>
</tr>
<tr>
<td><strong>6</strong></td>
<td>A new CD, book</td>
</tr>
<tr>
<td>**7 **JC **</td>
<td>A Hat, fast food</td>
</tr>
<tr>
<td><strong>8</strong></td>
<td>Sharpie, Candy</td>
</tr>
<tr>
<td><strong>9</strong></td>
<td>Mechanical pencils</td>
</tr>
<tr>
<td>**10 **Warren ****</td>
<td>A gold chain, fast food</td>
</tr>
</tbody>
</table>

*Table 2.2. Preference questionnaire results. Depicted here are the results from the administered questionnaire. The number corresponds with each student in the class, Bethany was number 3, JC was number 7, and Warren was number 10.*
Interobserver Agreement (IOA)

A secondary observer scored homework for accuracy and completion for approximately 35% of homework samples across sessions, and IOA was calculated using point-by-point comparison (i.e., dividing the total number of agreements by the total number of agreements plus disagreements and multiplying by 100 to yield a percentage of agreement).

Treatment Integrity

Treatment integrity was assessed across all (100%) sessions using a checklist to determine the extent to which the intervention was implemented as described. The experimenter observed the teacher implementing the spinner procedures and completed the checklist, indicating whether the steps were implemented correctly. The number of correctly completed steps was divided by the total number of steps and multiplied by 100.

Social Validity

The experimenter administered a survey to the teacher and participants (see Appendix E). The following questions were asked to the teacher with a five-point likert scale (Strongly disagree, somewhat disagree, neutral, somewhat agree, strongly agree). Students and teacher both filled out surveys so experimenters could assess the extent to which they were satisfied with goals, procedures, and outcomes of the intervention.
Chapter 3: Results

Results for each participant are detailed in this chapter. These results include data for each of the students’ responses on their completion and accuracy of homework. This chapter also includes data for interobserver agreement (IOA), treatment integrity for the teacher implementing the intervention, and social validity procedures.

Interobserver Agreement

Interobserver agreement (IOA) data were collected in each phase for each participant. Total agreement method was used. IOA was calculated by dividing the smaller total (e.g., number of questions completed or number of questions answered correctly) divided by the larger total, this sum was multiplied by 100 and that total equaled the agreement for that session. A second observer scored a minimum of thirty percent of homework samples across all sessions. Across all phases, dependent measures, and participants, the average agreement was 96% ranging from 95%-97%. Percentages of IOA data collected per phase are presented in Table 3.1. Data for each participant are presented in Table 3.2.

Treatment Integrity

The experimenter collected data on the accuracy of the teacher’s implementation of the independent variable across 100% of the sessions. The percentage of reliability was determined by dividing the number of steps completed
correctly by the total number steps completed and multiplied by 100. If there was no opportunity to engage in a step, it was scored as “n/a” (e.g., during baseline conditions, the teacher would not use the spinner). Results for treatment integrity were averaged at 96% across all sessions ranging from 75%-100%.
<table>
<thead>
<tr>
<th>Phase</th>
<th>Number of Sessions</th>
<th>Percentage of Sessions Scored</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>1</td>
<td>33%</td>
</tr>
<tr>
<td>Intervention 1</td>
<td>5</td>
<td>38%</td>
</tr>
<tr>
<td>Baseline 2</td>
<td>4</td>
<td>40%</td>
</tr>
<tr>
<td>Intervention 2</td>
<td>3</td>
<td>30%</td>
</tr>
</tbody>
</table>

*Table 3.1.* Interobserver agreement data information. This table provides information about how much data were scored across each session by a second observer.
<table>
<thead>
<tr>
<th>Student</th>
<th>Total number of Agreements</th>
<th>Total number of Disagreements</th>
<th>IOA (in percentage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bethany</td>
<td>168</td>
<td>8</td>
<td>95%</td>
</tr>
<tr>
<td>Warren</td>
<td>151</td>
<td>4</td>
<td>97%</td>
</tr>
<tr>
<td>JC</td>
<td>187</td>
<td>7</td>
<td>96%</td>
</tr>
<tr>
<td>Total</td>
<td><strong>506</strong></td>
<td><strong>19</strong></td>
<td><strong>96%</strong></td>
</tr>
</tbody>
</table>

*Table 3.2. Summary of IOA results. This table summarizes the total number of agreements and disagreements between the two observers for each participants and the IOA for each participant.*
Completion

This section reports the completion data for Bethany, JC, and Warren. Overall, data were somewhat variable, more so in the baseline phases than in the intervention phases.

**Bethany.** Figure 3.1 shows the data for Bethany’s responses for her homework completion. Bethany’s baseline data for homework completion consisted of three data points, which showed a downward descending trend. The mean value for completion of homework was 73.2%, with a range from 53-100% complete.

During the accuracy and completion criteria phase, the data were very stable apart from the last day of the phase when Bethany did not complete her homework. There were a total of eight data points in this phase with a mean value of 85%. There was a range from 0 to 100%.

The completion only phase consisted of six data points and was at a high level. This phase had little variability as she turned her homework in all of the sessions. The mean value was 100% with no range.

The second return to baseline condition consisted of 15 data points. Bethany’s completion was variable throughout the phase. She completed her homework 10 times, did not complete her homework four times and partially completed her homework once. The mean value for completion in the second baseline condition was 72% ranging from 0-100%.

For the second return to intervention (completion without accuracy criterion) condition, the phase consisted of 10 data points. Bethany’s completion was relatively invariable, apart from one data point where she only partially
completed her homework. The mean value for completion in the second intervention phase was 97%, ranging from 75%-100%.

**JC.** Figure 3.2 shows the data for JC’s responses for his homework completion. JC’s completion baseline data consisted of three data points that showed a downward stable trend. The mean value for completion in the first baseline condition was 15.8% with a range of 0-47%.

JC's completion data in the completion and accuracy criteria consisted of eight data points and was variable throughout the phase. He did not complete his homework on two sessions and partially completed his homework on five sessions, and completed his homework once. The mean value for the completion in this phase was 58.8% with a range of 0-100%.

JC’s completion data in the completion only criterion phase consisted of six data points and was somewhat variable. He turned his homework in on three days and did not turn his homework on three days. The mean value for the completion in this phase was 40% with a range of 0-100%.

JC’s completion data in the second baseline consisted of fifteen data points. The phase was variable and with low levels. JC completed his homework on seven days and did not complete his homework on nine days. The mean value for completion in this phase was 44% ranged from 0-100%.

The second return to intervention (without accuracy criterion) condition consisted of ten data points. JC’s performance was initially variable, then stable, and finally low. He completed his homework on three sessions and did not complete his
homework on seven sessions. The mean value for completion in the second intervention phase was 44% ranging from 0-100%.

**Warren.** Figure 3.3 shows the data for Warren’s responses on his homework completion. Warren’s completion data in the baseline phase consisted of three data points where he did not complete his homework at all. The mean value for completion in this phase was 0% and ranged from 0-0%.

Warren’s completion data in the accuracy and completion criteria phase consisted of five data points. The data were relatively variable; he turned his homework in two of the sessions and did not turn in his homework on three of the sessions. The mean value for completion in this phase was 40% and ranged from 0-100%.

Warren’s completion data in the completion only criterion phase consisted of eight data points. Warren’s data started out variable but stabled out at the end with high levels. He completed his homework six times and did not complete his homework two times. The mean value for homework completion in this phase was 75% and ranged from 0-100%.

Warren’s completion data in the second baseline condition consisted of fifteen data points with much variability. There were seven days he turned in his homework and nine days he did not. The mean value for completion was 44% ranging from 0-100%.

Warren’s completion data in the second intervention phase (without accuracy criterion) consisted of ten data points. His trend is relatively variable, starting consistently high, dipping down, and going back up and then dropping.
down. There were four days he completed his homework, three days he did not, and two days he partially completed it. The mean value for completion was 52% ranging from 0-100%.

**Accuracy**

This section reports the accuracy data for Bethany, JC, and Warren. Overall, data were very variable, consistent across all participants. Levels were relatively low across all participants.

**Bethany.** Figure 3.4 shows the data for Bethany’s responses for her homework completion. Bethany’s baseline data for homework accuracy consisted of three data points, which showed a descending trend. The mean value for accuracy of homework (in percentage) was 62%, with a range of 100 to 28 percent.

During the accuracy and completion criteria phase, data were relatively variable. Data started 50% increased and then decreased. There were a total of eight data points with a mean value for accuracy was 50% with a range from 0 to 100% in this phase.

During the completion only criterion, data began to decrease and stabilize with low levels. There were a total of five data points with a mean value of 27.4%. There was a range from 12-46% in this phase.

The second baseline condition consisted of fifteen data points and had variable but upward trend. Levels in this phase were low. The mean value for this phase was 28% ranging from 0-92%.

The second return to intervention condition consisted of 10 data points. Bethany’s performance was relatively variable; performance was high, descended
and increased again. Levels are higher in this phase. The mean value for this phase was 72%, ranging from 13%-100%.

JC. Figure 3.5 shows the data for JC’s responses for his homework accuracy. JC’s accuracy baseline data consisted of three data points that showed a downward stable trend. The mean value for accuracy in the first baseline condition was 16% with a range of 0-46%.

JC’s accuracy data for the accuracy and completion criteria consisted eight data points and was variable throughout the entire session with higher levels. The mean value for accuracy in the phase was 48% with a range of 0-100%.

JC’s accuracy data for the completion only criterion consisted of four data points and were variable but slightly less than the accuracy and completion criteria. Levels in this phase were lower than in the previous phase. The mean value for accuracy this phase was 23% and with a range of 0-65%.

JC’s accuracy data for the second baseline consisted of 15 data points that were somewhat variable with a high peak in the middle of the phase. Levels in this phase were low. The mean value for accuracy in this phase was 25% ranging from 0-100%.

The second return to intervention phase consisted of 10 data points. JC’s performance was relatively variable in the first half in the phase and low and stable in the second half. The mean value for accuracy in this phase was 41%, ranging from 0-100%.
**Warren.** Figure 3.5 shows the data for Warren’s responses on his homework accuracy. On the first three sessions, Warren scored 0% on each of the sessions. The mean value for accuracy in the first baseline condition was 0% with a range of 0-0%.

Warren’s accuracy data in the completion and accuracy criteria consisted of five data points. The data had an incline with a steady decline and maintained at zero for two sessions. The mean value for accuracy in this phase was 17% with a range of 0-56%.

Warren’s accuracy data in the completion only phase consisted of eight data points. The phase had an upward trend with high levels. The mean value for accuracy in this phase was 61% and the data ranged from 0-97%.

Warren’s second baseline condition consisted of 15 data points with overall variability and low levels. The mean value for accuracy in this phase was 28%, ranging from 0-82%.

Warren’s second intervention consisted of 10 data points with an overall stabilizing downward trend and low levels. The mean value for accuracy in this phase was 31% ranging from 0-100%.
Figure 3.1. Bethany’s data for homework completion. This graph depicts Bethany’s homework completion. Blue lines indicate trend lines for mean values across phases.
Figure 3.2. Data for JC’s homework completion. This graph represents JC’s homework completion. Blue lines indicate trend lines for mean values across phases.
Figure 3.3. Data for Warren’s homework completion. This graph shows Warren’s homework completion. Blue lines indicate trend lines for mean values across phases.
Figure 3.4. Data for Bethany's homework accuracy. This graph displays Bethany's homework accuracy. Blue lines indicate trend lines for mean values across phases.
**Figure 3.5.** Data for JC’s homework accuracy. This graph shows JC’s homework accuracy. Blue lines indicate trend lines for mean values across phases.
Figure 3.6. Data for Warren's homework accuracy. This graph displays Warren's homework accuracy. Blue lines indicate trend lines for mean values across phases.
Social Validity

Social validity was evaluated using two methods: a questionnaire administered to the students who participated in the study and the teacher in the classroom, and additionally, anecdotal comments were measured to assess social validity. The student questionnaire consisted of seven questions, the first six questions required the student to rate the intervention on a five-point likert scale, and the last question was an open-ended question to add any additional information. The teacher’s questionnaire consisted of seven questions, the first six required her to rate the intervention on a five-point likert scale, and the last question as an open-ended question to add any additional information.

Students. Two of the three students felt the spinner improved their accuracy and completion, all three of the students looked forward to using the spinner, the students felt the reinforcers were appropriate and were motivated by them, all the students would like for their teacher to continue to use the intervention once the research study was over, and two of the three would like other teachers to introduce the intervention in the other classes. Warren believed that the spinner motivated him to complete his homework, which improved his grade. The teacher taught two sections of 8th grade language arts, and the intervention was only used in one. JC liked that his class section was chosen.

Some additional anecdotal comments that relate to social validity include during the second return to baseline, Bethany asked the teacher every day if they were going to get to use the spinner. Warren and JC would ask to spin the spinner when they did not fully complete their homework (e.g., 60% complete). When the
teacher told the students they were going back to intervention, the students produced an audible cheer. There was an overall high level of social validity between all participants in the study.

**Teacher.** The results of the social validity questionnaire administered to the classroom teacher are as follows: the teacher did not believe the intervention affected the student’s homework accuracy at all but she did believe it somewhat improved their homework completion. She believed there was high ease of use; she is likely to use the spinner in future classes to target homework compliance as well as other topographies. She felt that the intervention was motivating for the students and provided appropriate reinforcers, but did not always affect the student’s behavior.

At the end of the study, the teacher asked if she could keep the intervention materials (spinner and tokens) so she could implement the intervention in future classes. The intervention had very high social validity between both the teacher and the students.
Chapter 4: Discussion

This chapter will present the results in regards to the research questions and previous research. It will also discuss the limitations of the study, implications for practice, and recommendations for future research.

Research Question 1

What are the effects of indiscriminable contingencies on the completion of homework for students who have learning disabilities in a secondary language arts class?

Results of this study suggest that a functional relation was demonstrated for two of three participants (Bethany and Warren) with the completion measure. In regards to the first research question, there are several points that should be discussed. There were competing contingencies that effected students homework completion, especially JC’s performance. All of these variables greatly effected the student’s completion of homework in all condition of the intervention.

Previous research on homework suggests the most difficult variables to account for are controlling competing contingencies and home-life (Trammel et al., 1994). Our findings with JC are consistent with other literature, stating that social activities, extracurricular function, sporting events, and TV compete with homework completion. We tried to account for this by allowing students to complete their homework in their daily supplemental period (i.e., study hall); however, we did not
factor in other homework the students had. Additionally, instead of completing homework, Warren would often not complete homework in his supplemental period and tells his teacher it was complete, but when she collected it, it was not complete. When the researcher asked JC why he was not completing his homework, he informed her of his busy after-school schedule (i.e., athletics) and by the time he got home, he was too tired to complete his homework. The competing reinforcer (e.g., attending basketball practice) was much stronger than completing his homework, in this situation.

**Research Question 2**

*What are the effects of indiscriminable contingencies on the accuracy of homework in students who have learning disabilities in a secondary language arts class?*

Results suggest that a functional relation was not demonstrated for any of the participants with the accuracy measure. In regards to the second research question, there are a few points that should be examined. While we tried to control for the homework being assigned, the teacher did not always follow our recommendations. Often times, she used homework as a teaching tool rather than extended practice on an already mastered concept. There was no discernable difference of student’s accuracy performance across phases for this reason. The teachers current practices were not always aligned with best practices, as one article suggests that teachers are advised to keep in consideration that homework should be designed to give students an opportunity to practice skills taught in class, demonstrate mastery, review work, and study for tests (Epstein & Voorhis, 2001).
Due to the inconsistency of homework, it was not whether clear that the intervention had effects on the student’s accuracy scores.

**Research Question 3**

*What are the opinions of the teacher and participants on the use of indiscriminable contingencies to improve math homework completion and accuracy?*

In regards to the third research question, there are two points that should be examined. Overall, the intervention had high social validity across all participants and the teacher implementing the intervention. Even though the participants rated the intervention with high regards, it did not always translate to affecting their performance. The participants particularly liked having the opportunity to spin the spinner and receiving rewards for completing their homework. We hypothesize that the variability of assignments and competing contingencies are responsible for the irregularity in student’s homework completion and performance.

The teacher did not rate the intervention as high as the participating students, but her behaviors did not match her verbal report. She asked to keep the intervention materials to implement the intervention (or variations of it) in future classes. Additionally, during the return to baseline, she was disappointed when the students were not able to go back to intervention as quickly as we were hoping (due to the instability of their performance in that phase).

**Limitations and Future Directions**

There were four major limitations in this study including the inconsistency of homework assignments, utilization of reversal design and length of second baseline,
no generalization or maintenance measures, and the difficulty the researchers experienced identifying appropriate reinforcers.

The biggest limitation in this study was the inconsistency of homework assignments. Across all phases of the intervention, the assignments varied in length, difficulty, content, and amount mastered by students. That is, the teacher sometimes assigned homework for the sake of “doing so” but not as a practice tool. Some homework assignments were not based on the day’s lesson but things she thought the students needed to learn or should master by high school, and consequently, the students performed poorly on those assignments (see Appendix H for homework samples). The variability of homework assignments also greatly affected the probability of students completing their homework. That is, the less response effort or the easier the assignment, the more likely the students were to complete their assignment. We found that when assignments were directly related to the lesson plan, the students performed quite high. A major limitation of Moore et al. 1994 was the inconsistency of assignments. We tried to account for this by asking the teacher to assign assignments that were the same length and required the same response effort, but she hardly ever followed these guidelines. Bethany especially did not complete hard assignments or skipped over questions she did not know. Considering the teacher in this study had just graduated from a teacher preparation program and had not been taught explicitly how to assign homework, future researchers should focus on both preparing future teachers and providing continuing education for current teachers on effective and efficient homework evidence based practices. Other ways future researchers can account for our
limitations are by creating homework assignments based off the teachers lesson plan. Homework should be the same modality (type of questions), number of questions, and require the same response effort across all sessions and phases.

Another major limitation of this study was the length of the second baseline. The return to baseline phase consisted of fifteen data points, which accounted for over 36% of the entire intervention. This is problematic because the students are not contacting reinforcement and losing motivation to do their homework. Experimental decisions were based off of Warren’s performance. We decided to remove the accuracy criterion in the first intervention phase due to of the structure of homework, and because Warren was not contacting reinforcement for completing his homework. To return to intervention, we ultimately based our decision off of Warren’s data due to the end of the school year approaching. Future studies may want to consider utilizing another research design to demonstrate experimental control that does not require a return to baseline, for example, a changing criterion design based on accuracy of homework (utilizing the above guidelines), or a multiple baseline across classrooms or participants.

The third limitation of this study was the absence of maintenance or generalization measures. This was problematic because it took so long to establish experimental control in the experiment and the school year ended before maintenance measures could have been taken. Future research should begin the study earlier in the school year (i.e., fall instead of winter) to prevent this from happening.
The last limitation was identifying appropriate and inexpensive reinforcers for completing homework. A major limitation from Madaus et al. (2003) was that the reinforcers selected were truly not reinforcers. We tried to account for this by administering a preference questionnaire to the students, interview the teacher, and allow them to make choices, but it still proved to be very difficult. Most of the reinforcers the students selected during their preference questionnaire were unhealthy edibles reinforcers (e.g., chips, McDonalds, candy). The experimenters tried to find other more healthy alternatives (e.g., activity reinforcers, school supplies, tangible reinforcers, etc.), but the students always chose the edibles when they exchanged their tokens for reinforcers. This is a common struggle teachers face in applied settings—when we interviewed the teacher and asked, “what motivates your students?” She replied, “nothing besides candy”. Interestingly, all the students rated the reinforcers very high on the social validity questionnaire.

Future research should continue to explore age-appropriate reinforcers and healthy alternatives for the students the intervention is targeted towards.

**Recommendations for Practice**

The findings from this study suggest that indiscriminable contingencies are an effective strategy to improve homework completion and could affect homework accuracy if the right contingencies are in place. The materials needed are relatively low cost, and could be substituted for items found in the classroom, which make it appealing to educators, therapists, and parents.

If considering implementing indiscriminable contingencies in the future, it would be beneficial to consider several things prior to beginning the intervention.
First, consider the homework being assigned. Are the students being set up to succeed? If the content in the homework is not at mastery, the students will be less likely to attempt it. If the homework is too hard or irrelevant to what is being taught, consider revising the homework assignments. Next, choose a pool of inexpensive rewards. Involve the students in selecting the reinforcers by either giving them open-ended questions “what would you like to earn for doing your homework?” or have them rank pre-selected reinforcers. Then, make the materials (e.g., spinner, tokens, bags, reward menu, etc.). It is advised to write the students names on bags or bins to save the tokens so the tokens stay organized. After considering the homework, reinforcers, and preparing the materials, the intervention is ready to begin. Explain the contingencies to the students, make the rewards inexpensive so they can contact them frequently, track student’s progress and make modifications as necessary.

**Conclusion**

This study showed that indiscriminable contingencies might be an effective intervention for improving homework completion in middle school students with learning disabilities. The intervention was low-cost, easy to implement, and took little instructional time to employ. The intervention attained high social validity among the three students who participated in the study, as well as the teacher who utilized it. The intervention could be applied across a variety of target behaviors (designed to decrease or increase a behavior) and can be utilized by a varied of individuals including: peers, caregivers, paraprofessionals, therapists, and many
more. Overall, indiscriminable contingencies are an emerging intervention and more research is needed to establish its effectiveness.
References


Appendix A: Data Collection Forms

<table>
<thead>
<tr>
<th>Student Name</th>
<th>100% Complete? If not, percentage completed?</th>
<th>60% Accurate?</th>
<th>Accuracy?</th>
<th>Opportunity to spin spinner?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Yes/ No</td>
<td>Yes/ No</td>
<td>Yes/ No</td>
<td>Yes/ No</td>
</tr>
<tr>
<td>2</td>
<td>Yes/ No</td>
<td>Yes/ No</td>
<td>Yes/ No</td>
<td>Yes/ No</td>
</tr>
<tr>
<td>3</td>
<td>Yes/ No</td>
<td>Yes/ No</td>
<td>Yes/ No</td>
<td>Yes/ No</td>
</tr>
<tr>
<td>4</td>
<td>Yes/ No</td>
<td>Yes/ No</td>
<td>Yes/ No</td>
<td>Yes/ No</td>
</tr>
<tr>
<td>5</td>
<td>Yes/ No</td>
<td>Yes/ No</td>
<td>Yes/ No</td>
<td>Yes/ No</td>
</tr>
<tr>
<td>6</td>
<td>Yes/ No</td>
<td>Yes/ No</td>
<td>Yes/ No</td>
<td>Yes/ No</td>
</tr>
<tr>
<td>7</td>
<td>Yes/ No</td>
<td>Yes/ No</td>
<td>Yes/ No</td>
<td>Yes/ No</td>
</tr>
<tr>
<td>8</td>
<td>Yes/ No</td>
<td>Yes/ No</td>
<td>Yes/ No</td>
<td>Yes/ No</td>
</tr>
<tr>
<td>9</td>
<td>Yes/ No</td>
<td>Yes/ No</td>
<td>Yes/ No</td>
<td>Yes/ No</td>
</tr>
<tr>
<td>10</td>
<td>Yes/ No</td>
<td>Yes/ No</td>
<td>Yes/ No</td>
<td>Yes/ No</td>
</tr>
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</table>

Observer:
Date homework was assigned:
Date homework was scored:
<table>
<thead>
<tr>
<th>Student Name</th>
<th>Day</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
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<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>tokens earned / total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix B: Reinforcer Menu

<table>
<thead>
<tr>
<th>Reward Menu</th>
<th>Tokens</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small Candy (Starburst)</td>
<td>2 tokens</td>
</tr>
<tr>
<td>Large Candy (M&amp;Ms)</td>
<td>4 tokens</td>
</tr>
<tr>
<td>Listen to Music during work time</td>
<td>6 tokens</td>
</tr>
<tr>
<td>Mechanical Pencil</td>
<td>8 tokens</td>
</tr>
<tr>
<td>Sharpie</td>
<td>12 tokens</td>
</tr>
<tr>
<td>Soda</td>
<td>12 tokens</td>
</tr>
<tr>
<td>Hot Cheetos/Hot Fries</td>
<td>12 tokens</td>
</tr>
<tr>
<td>3 items from McDonald's Dollar Menu</td>
<td>20 tokens</td>
</tr>
</tbody>
</table>
## Appendix C: Training Procedures

### Indiscriminable Contingencies on Homework Completion and Accuracy—Training Procedures

<table>
<thead>
<tr>
<th>1. Provides a rationale behind homework and indiscriminable contingencies.</th>
<th>Yes?</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. The trainer provided materials to the teacher</td>
<td></td>
</tr>
<tr>
<td>b. The time spent actively engaged in a learning activity (including homework) may be the single best indicator of achievement among students with disabilities (O’Melia &amp; Rosenberg, 1994).</td>
<td></td>
</tr>
<tr>
<td>c. The National Commission on Excellence in Education (1983) recommended that students, especially those in junior and senior high schools, should be assigned substantially more homework than was been given at that time. Middle school students are recommended to spend anywhere from one to two hours per night on homework (Cooper &amp; Valentine, 2001)</td>
<td></td>
</tr>
<tr>
<td>d. 58% of students in special education settings experience difficulties completing their homework (Polloway et al., 1992). Bryan and Nelson (1994) found that students with learning disabilities were less likely to complete homework, expressed boredom and resistance towards homework, perceived themselves less competent as their peers in completing assignments, and tend to have stronger negative feelings towards homework. Polloway et al. (1992) and Epstein, Polloway, Folley and Patton (1993) discovered teachers and parents describe students with learning disabilities to be more likely to procrastinate, need more reminders, need someone in the room to complete the homework, and be more easily distracted when completing homework. Despite the homework problems students with learning disabilities may experience, undoubtedly, the current trend towards increased scholastic rigor requires that these students must able to respond to the homework, as it becomes a fundamental component of their education (Epstein, Polloway, Folley, &amp; Patton, 1993).</td>
<td></td>
</tr>
<tr>
<td>e. Indiscriminable contingencies are ones in which the learner cannot distinguish whether the next response will produce reinforcement (Cooper, Heron, &amp; Heward, 2007). It includes arranging a contingency in which reinforcement is delivered on some but not all occurrences of behavior, and the behaver is unable to predict which response will produce reinforcement. Delayed reinforcement and intermittent reinforcement are examples of indiscriminable contingencies.</td>
<td></td>
</tr>
<tr>
<td>i. The trainer explains that the indiscriminable contingency used in this intervention will be the introduction of the spinner.</td>
<td></td>
</tr>
</tbody>
</table>
Daily procedures are:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Teacher collects homework</td>
</tr>
<tr>
<td>2.</td>
<td>Teacher allows students who meet criterion spin the spinner</td>
</tr>
<tr>
<td>3.</td>
<td>Teacher gives out appropriate number of tokens and delivers verbal praise</td>
</tr>
<tr>
<td>4.</td>
<td>If students want to exchange tokens for back-up reinforcers, they do so now.</td>
</tr>
<tr>
<td>5.</td>
<td>Teacher encourages students who do not meet criterion to spin to try hard next time</td>
</tr>
</tbody>
</table>

a. Trainer discussed feasibility of reinforcer menu with teacher
b. Trainer discussed time of day intervention will be implemented with teacher
c. Trainer discussed obtaining generalization samples
d. Trainer asked teacher if she had any question and gave instructions to implement the indiscriminable contingencies intervention.
Appendix D: Treatment Integrity Checklist

<table>
<thead>
<tr>
<th>Indiscriminable Contingencies on Homework Completion and Accuracy—Treatment Integrity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Provides a rationale behind homework.</td>
</tr>
<tr>
<td>a. Teacher explain the spinner to the students (first day only)</td>
</tr>
<tr>
<td>i. Completion must be 100%</td>
</tr>
<tr>
<td>ii. Accuracy must be 60%</td>
</tr>
<tr>
<td>- If you meet criterion, you get to spin the spinner</td>
</tr>
<tr>
<td>- Explain the indiscriminable contingencies</td>
</tr>
<tr>
<td>b. Teacher shows the students the spinner (first day only)</td>
</tr>
<tr>
<td>c. Teacher pulled target participants aside and explained the larger ($10-15)</td>
</tr>
<tr>
<td>reinforcers</td>
</tr>
<tr>
<td>d. Teacher collects homework</td>
</tr>
<tr>
<td>e. Teacher allows students who meet criterion spin the spinner</td>
</tr>
<tr>
<td>f. Teacher gives out appropriate number of tokens and delivers verbal praise</td>
</tr>
<tr>
<td>i. If students want to exchange tokens for back-up reinforcers, they do</td>
</tr>
<tr>
<td>so now.</td>
</tr>
<tr>
<td>g. Teacher encourages students who do not meet criterion to spin to try hard</td>
</tr>
<tr>
<td>next time</td>
</tr>
</tbody>
</table>

Notes:
Appendix E: Social Validity Questionnaires

E.1 Teacher Questionnaire

1) Did you find that the spinner improved the student’s accuracy on their homework?

1 2 3 4 5
not at all not very neutral somewhat very

2) Did you find the spinner improved the student’s completion of their homework?

1 2 3 4 5
not at all not very neutral somewhat very

3) Was the spinner easy to use?

1 2 3 4 5
not at all not very neutral somewhat very

4) What is the likelihood to use the spinner in future classes to increase homework compliance?

1 2 3 4 5
not at all not very neutral somewhat very

5) What is the likelihood you would use the spinner to target other behaviors in other students?

1 2 3 4 5
70
6) On a scale from 1-10 (10 being the highest) how would you rate the overall effectiveness of the spinner on homework compliance?

1 2 3 4 5 6 7 8 9 10

not at all effective              neutral              very effective

7) Additional Comments:
E.2 Student Questionnaire

1) Did you find that the spinner improved your homework accuracy?
   1 not at all  2 not very  3 neutral  4 somewhat  5 very

2) Did you find the spinner improved your homework completion?
   1 not at all  2 not very  3 neutral  4 somewhat  5 very

3) I looked forward to using the spinner.
   1 not at all  2 not very  3 neutral  4 somewhat  5 very

4) I liked the rewards I got for doing my homework.
   1 not at all  2 not very  3 neutral  4 somewhat  5 very

5) I would like if Miss. Faulhaber used the spinner in the future.
   1 not at all  2 not very  3 neutral  4 somewhat  5 very

6) I would like if other teachers used the spinner.
7) Additional Comments:

_________________________________________________________________________________________________
_________________________________________________________________________________________________
_________________________________________________________________________________________________
_________________________________________________________________________________________________
_________________________________________________________________________________________________
_________________________________________________________________________________________________
_________________________________________________________________________________________________
_________________________________________________________________________________________________
_________________________________________________________________________________________________
_________________________________________________________________________________________________
_________________________________________________________________________________________________
_________________________________________________________________________________________________
Appendix F: Homework Samples

EDITING KEY: Social Studies Article

Day 7 - 10A 2128

After the water stopped boiling out, Colter did not run away. He carefully crept the three and one-half yards to the geyser. Gurgling noises still came from the hole, and steam wafted above it. Colter was startled because he had never seen anything so strange before. As he continued his journey, the day continued to see odd things. There were bubbling puddles of gray and yellow mud, and there was a crystal pool of scalding blue water. The air had a sulfurous odor, like rotten eggs.

WEDNESDAY

When Colter next met with his friend, he told them about the geysers and other wonders. His friend laughed at Colter because they did not believe him how could there be a land where the ground was hot and boiling water flung itself into the air? Colter's friends thought he was telling a tale. They laughed and gave his imaginary land the name Colter's Hell. Today, we know what Colter saw was real, and we can see all the wonders he saw, too, if we go to Yellowstone national park.

THURSDAY

Error Summary
- Capitalization: 4
- Language Usage: 3
- Punctuation:
  - Comma: 4
  - Period: 3
  - Other: 1
- Spelling: 2

Error Summary
- Capitalization: 9
- Punctuation:
  - Apostrophe: 2
  - Comma: 2
  - Period: 1
  - Other: 1
- Spelling: 3
Harris and Me Questions: Chapters 5

1. Knute was talking to Bill and Bob who were in the shade of the poplars.

2. Harris crawled all over the horses as he helped Knute with the straps.

3. Harris and the boy rode on the horses.

4. Harris wanted to leave before Buzzer heard them.

5. Harris got a penny for every two mice from Louie. (money)

6. Buzzer jumped on the back of the horse being ridden by the boy.

7. Explain how Buzzer got his name. (5 points).
   Buzzer killed their collie dog and Louie said it sounded like a buzz saw.

8. List four things they had for their field lunch.
   a. bread with butter
   b. cheese
   c. beef stew
   d. round cake cookies

9. What kind of animal was Buzzer and how did he become a member of the Larson household?
   Lynx; Louie found him in the woods.

10. Name the seven things that the boy had done in just one day.
    1. Worked at the separator 2. Ran from a rooster 3. Wrestled pigs 4. Ridden horses
Words that sound the same but are spelled differently are called **homonyms**.

**Examples:**
- to — too
- cent — sent
- hear — here

- For each word in Column A there is a homonym in Column B. Write the number of its homonym next to each word in Column A.

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>wait</td>
<td>3</td>
</tr>
<tr>
<td>ceiling</td>
<td>5</td>
</tr>
<tr>
<td>piece</td>
<td>7</td>
</tr>
<tr>
<td>side</td>
<td>1</td>
</tr>
<tr>
<td>threw</td>
<td>11</td>
</tr>
<tr>
<td>vain</td>
<td>13</td>
</tr>
<tr>
<td>weather</td>
<td>2</td>
</tr>
<tr>
<td>no</td>
<td>12</td>
</tr>
<tr>
<td>chews</td>
<td>4</td>
</tr>
<tr>
<td>brake</td>
<td>9</td>
</tr>
<tr>
<td>ate</td>
<td>16</td>
</tr>
<tr>
<td>herd</td>
<td>8</td>
</tr>
<tr>
<td>hire</td>
<td>14</td>
</tr>
<tr>
<td>pair</td>
<td>10</td>
</tr>
<tr>
<td>bare</td>
<td>15</td>
</tr>
</tbody>
</table>
Boy in the Striped Pajamas Vocabulary

dismissively  obliged  coincide  forlorn  contradict  clamber
foreseeable  escapade  resolution  crucial  inconsolable
plague  enunciate  incumbent  senile  unaccustomed

Fill in the blanks with the vocabulary words above.

1. Mother was waving her hand _dismissively_, as if the making of a boy's three best friends for life was an easy thing.

2. Bruno had to _clamber_ up the tree to see across the garden.

3. It was _crucial_ for Bruno not to leave his property.

4. Father is not _obliged_ to pay Maria.

5. Bruno had to _enunciate_ his words so that the boy could understand him.

6. This is our home for the _foreseeable_ future and we just have to make the best of things.

7. Bruno and Gretel were not allowed to _contradict_ their parents.

8. There was a _plaque_ attached to the top of the bench but Gretel couldn’t read the inscription from the distance.

9. Bruno went on an _escapade_ to explore his new home and property.

10. Father and Bruno’s opinions of where to live did not _coincide_.

11. Bruno had a _forlorn_ expression on his face when he was told he was moving.

12. Bruno was _inconsolable_ when he found out he had to leave Berlin.

13. It is _incumbent_ for all of Father’s soldiers to call him Commandant.

14. Father made a _resolution_ to move his family to Out-With.

15. The man peeling potatoes was old and _senile_.

16. Bruno and Gretel are _adapted_ to being in a strange city.
Inferences

Read the paragraph and answer the questions.

1. "Huh," Stefania said to herself as she stared at her garden. "How did that happen? I didn't know that flowers would bloom there."

Stefania was walking around in her perennial garden. She had learned to love gardening from her mother, who had a huge garden in the back yard. She and her mom were the only ladies in the house, and the men didn't seem interested in flowers. However, since Stefania showed great interest, Dad and Mom agreed that she could have a 10 x 12 section of the yard as her own garden. Stefania had ordered some perennial plants last fall from a catalog and planted them. She liked the idea that they would come back every year and that she would have flowers from spring through summer. However, now she was seeing some daffodils.

"What are you thinking?" Mom asked as she approached Stefania, wiping her hands of the dirt from her own garden.

"I'm trying to figure out where these daffodils came from," Stefania answered. "I don't remember planting bulbs last fall. I know they come from bulbs, but I only remember planting the baby plants that came from the nursery I ordered them from."

Stefania's mother smiled. "I think you'd better think again, Stefania."

"Mom, I really don't remember planting bulbs!" Stefania was getting a little frustrated.

"I didn't say YOU planted them, Stefania." Mom grinned.

Stefania's mouth began to form a grin of her own. "Oh, yes, now I remember. I was curious about what bulbs were. I wasn't impressed by having to wait to see the flowers, so I didn't want to plant them. SOMEONE told me, though, that they would be worth the wait."

"They sure are," Stefania's mother agreed.

Why wasn't Stefania interested in planting bulbs?

- She couldn't immediately see the flowers.
- They were too expensive.
- She was afraid they would not come back.
- Her mother was the only one who liked bulbs.

Who could you infer planted the bulbs?

- Her mother

Put the events in the order in which they occurred.

1. Stefania planted perennial plants.
2. An unknown person planted bulbs.
3. The bulbs grew into daffodils.
4. Stefania tried to figure out who planted the bulbs.
Inferences

Read the paragraph and answer the questions.

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2. An unknown person planted bulbs.
1. Stefania planted perennial plants.
4. Stefania tried to figure out who planted the bulbs.
Appendix G: Parent Recruitment Letter

Dear Parents:

My name is Dr. Sheila Morgan. I am a member of the special education faculty at The Ohio State University. My master’s student, Melissa Boggs, and your child’s teacher, Jillian Faulhaber, are helping me with a research study. This study is being done to see if introducing a reinforcement strategy will improve homework completion and accuracy. Specifically, Ms. Faulhaber will check your child’s homework at the beginning of class. If the homework is completed and meets an accuracy criterion, your child will have an opportunity to spin a spinner. The spinner will be divided into sections, and each section will indicate whether or not the student will get a prize. After the students master the 60% accuracy criteria, the criteria will be increased to 80% accuracy.

The purpose of the study is to see if using intermittent reinforcement is effective in improving students accuracy and completion of homework. We do not anticipate any risks or discomforts to your child as a participant in this research. You child’s teacher, Ms. Faulhaber, will be using the reinforcement strategy with all of her students regardless of their participation in this research. However, we are asking your permission to access your child’s homework scores for data collection purposes and to report those data anonymously. Your child’s identity will not be revealed in any report, and confidentiality will be maintained by using numbers (instead of names) on all reports and data collection forms. We expect this study to continue for about 24 weeks.

Your consent is voluntary. If you allow your child to participate in the study, you may discontinue his participation at any time without penalty or loss of benefits. Please contact me at 614-247-8714 if you have any questions. If you consent to have your child included in this research, please sign the attached consent form. For questions about your child’s rights as a participant in this study or to discuss other study-related concerns or complaints with someone who is not part of the research team, you may contact Ms. Sandra Meadows in the Office of Responsible Research Practices at 1-800-678-6251.

Sincerely,

Sheila Morgan
Appendix H: Parent Consent Form

The Ohio State University Parental Permission
For Child's Participation in Research

Study Title: The Effects of Intermittent Reinforcement on the Accuracy and Completion of Homework in Middle School Students with Learning Disabilities
Researcher: Dr. Sheila Morgan
Sponsor: n/a

This is a parental permission form for research participation. It contains important information about this study and what to expect if you permit your child to participate.

Your child's participation is voluntary. Please consider the information carefully. Feel free to discuss the study with your friends and family and to ask questions before making your decision whether or not to permit your child to participate. If you permit your child to participate, you will be asked to sign this form and will receive a copy of the form.

Purpose: The purpose of this study is to see if an intermittent reinforcement strategy will improve student's homework completion and accuracy scores.

Procedures/Tasks:
In this study, the experimenters will examine your child’s homework scores (percent complete and percent correct). Your child will turn in regularly assigned homework to his or her teacher. The teacher will check your child’s homework for accuracy and completion. If your child’s homework is at least 60% correct in the early phases and 80% correct in the later phases of the study, your child will earn the opportunity to spin a spinner for a chance to receive a prize. The spinner is divided into several sections that indicate various prizes or no prize.

Duration: The study will take place for approximately 20-24 weeks. Your child will participate 2 to 3 days per week and each session will last no more than 15 minutes.

Your child may leave the study at any time. If you or your child decides to stop participation in the study, there will be no penalty and neither you nor your child will lose any benefits to which you are otherwise entitled. Your decision will not affect your future relationship with The Ohio State University. Additionally, your decision on whether or not to provide permission for your child to participate will not in any way affect your child’s grades or standing in the class.
Risks and Benefits:
Benefits may include increased achievement in homework tasks. The risks associated with this project are no greater than those experienced during regular classroom activities. It is possible that a student may become frustrated if they do not meet the accuracy criteria. To minimize this risk, your child’s teacher will provide guided support, feedback, and encouragement if a student begins to struggle.

Confidentiality:
Confidentiality will be maintained by using numbers (instead of names) on all data collection forms and reports of data. The data collection forms used for each student will be locked in a filing cabinet in the primary investigator’s office and destroyed within one year of the completion of the study.

Efforts will be made to keep your child’s study-related information confidential. However, there may be circumstances where this information must be released. For example, personal information regarding your child’s participation in this study may be disclosed if required by state law. Also, your child’s records may be reviewed by the following groups (as applicable to the research):
- Office for Human Research Protections or other federal, state, or international regulatory agencies;
- The Ohio State University Institutional Review Board or Office of Responsible Research Practices;
- The sponsor, if any, or agency (including the Food and Drug Administration for FDA-regulated research) supporting the study.

Incentives:
No incentives will be provided for participating in this study.

Participant Rights:
You or your child may refuse to participate in this study without penalty or loss of benefits to which you are otherwise entitled. If you or your child is a student or employee at Ohio State, your decision will not affect your grades or employment status. Deciding whether to take part in the research project or not will have no effect on your relationship or your child’s relationship to the teacher in the classroom.

If you and your child choose to participate in the study, you may discontinue participation at any time without penalty or loss of benefits. By signing this form, you do not give up any personal legal rights your child may have as a participant in this study.

An Institutional Review Board responsible for human subjects research at The Ohio State University reviewed this research project and found it to be acceptable, according to applicable state and federal regulations and University policies designed to protect the rights and welfare of participants in research.
Contacts and Questions:

For questions, concerns, or complaints about the study you may contact Melissa Boggs 614-788-9573 or Sheila Morgan 614-247-8714.

For questions about your child’s rights as a participant in this study or to discuss other study-related concerns or complaints with someone who is not part of the research team, you may contact Ms. Sandra Meadows in the Office of Responsible Research Practices at 1-800-678-6251.

If your child is harmed as a result of participating in this study or for questions about a study-related harm, you may contact Dr. Sheila Morgan (614-247-8714; morgan.651@osu.edu).

Signing the parental permission form

I have read (or someone has read to me) this form and I am aware that I am being asked to provide permission for my child to participate in a research study. I have had the opportunity to ask questions and have had them answered to my satisfaction. I voluntarily agree to permit my child to participate in this study.

I am not giving up any legal rights by signing this form. I will be given a copy of this form.

Printed name of subject

Printed name of person authorized to provide permission for subject

Signature of person authorized to provide permission for subject

Relationship to the subject

Date and time

AM/PM

Investigator/Research Staff

I have explained the research to the participant or his/her representative before requesting the signature(s) above. There are no blanks in this document. A copy of this form has been given to the participant or his/her representative.

Printed name of person obtaining consent

Signature of person obtaining consent

Date and time

AM/PM
Appendix I: IRB Approval Letter

Behavioral and Social Sciences Institutional Review Board

Office of Responsible Research Practices
300 Research Administration Building
1960 Kenny Road
Columbus, OH 43210-1063

Phone: (614) 688-8457
Fax: (614) 688-0366
www.orrp.osu.edu

October 23, 2013

Protocol Number: 2013B0451
Protocol Title: THE EFFECTS OF INTERMITTENT REINFORCEMENT ON THE ACCURACY AND COMPLETION OF HOMEWORK FOR MIDDLE SCHOOL STUDENTS WITH LEARNING DISABILITIES, Sheila Morgan, Educational Studies

Type of Review: Initial Review—Expedited
IRB Staff Contact: Jacob R. Stoddard
Phone: 614-292-0526
Email: stoddard.13@osu.edu

Dear Dr. Morgan,

The Behavioral and Social Sciences IRB APPROVED BY EXPEDITED REVIEW the above referenced research. The Board was able to provide expedited approval under 45 CFR 46.110(b)(1) because the research meets the applicability criteria and one or more categories of research eligible for expedited review, as indicated below.

Date of IRB Approval: October 22, 2013
Date of IRB Approval Expiration: October 22, 2014
Expedited Review Category: 7

In addition, the research was approved for the inclusion of children (permission of one parent sufficient).

If applicable, informed consent (and HIPAA research authorization) must be obtained from subjects or their legally authorized representatives and documented prior to research involvement. The IRB-approved consent form and process must be used. Changes in the research (e.g., recruitment procedures, advertisements, enrollment numbers, etc.) or informed consent process must be approved by the IRB before they are implemented (except where necessary to eliminate apparent immediate hazards to subjects).

This approval is valid for one year from the date of IRB review when approval is granted or modifications are required. The approval will no longer be in effect on the date listed above as the IRB expiration date. A Continuing Review application must be approved within this interval to avoid expiration of IRB approval and cessation of all research activities. A final report must be provided to the IRB and all records relating to the research (including signed consent forms) must be retained and available for audit for at least 3 years after the research has ended.

It is the responsibility of all investigators and research staff to promptly report to the IRB any serious, unexpected and related adverse events and potential unanticipated problems involving risks to subjects or others.

This approval is issued under The Ohio State University’s OHRP Federalswide Assurance #00006378.

All forms and procedures can be found on the ORRP website – www.orrp.osu.edu. Please feel free to contact the IRB staff contact listed above with any questions or concerns.

Michael Edwards, PhD, Chair
Behavioral and Social Sciences Institutional Review Board