The Effects of Choice Versus No-Choice of Task Sequence on Task Engagement

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THE EFFECTS OF CHOICE VERSUS NO-CHOICE OF TASK SEQUENCE ON TASK ENGAGEMENT

by

Britney Nicole Burton

Abstract of a Dissertation
Submitted to the Graduate School
of The University of Southern Mississippi
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy

December 2012
ABSTRACT

THE EFFECTS OF CHOICE VERSUS NO-CHOICE OF TASK SEQUENCE ON TASK ENGAGEMENT

by Britney Nicole Burton

December 2012

The purpose of the current investigation was to explore the differential effects of three choice-related conditions on the task engagement exhibited by four elementary-aged students in their regular education classrooms. The conditions examined included a No-Choice (NC) condition, a Choice of Task Sequence (CTS) condition, and a Choice of Reward (CR condition). In the NC condition, participants completed two tasks in a specified order; in the CTS condition, participants selected the order in which they completed two tasks; and in the CR condition, participants selected a preferred item or activity after completing two tasks in a specified order and demonstrating improved task engagement. Participants presented with no significant cognitive or behavior impairments, with substantially lower levels of task engagement than a same-sex peer, and with performance-related deficits in task engagement. Task engagement as well as task completion and task accuracy were examined using a multiple-baseline across participant dyads design and conditions were counterbalanced across student-teacher dyads. The results of the investigation indicate that CTS produced higher levels of task engagement than NC for one participant; CR produced higher levels of task engagement than NC for one participant; and CTS and CR produced similarly high levels of task engagement for one participant. General conclusions of the study are limited by several factors, particularly by the fact that idiosyncratic data were obtained. In addition,
individual conclusions are limited because variability and overlap were substantial for three of four participants. Some other important limitations should be noted. CR involved a combination of treatment components, for example, and reward criteria may have been invalid. Also, tasks originated from a variety of sources and the procedures used in the skill-performance deficit analyses were not traditional. This investigation is fairly unique in that participants did not have significant cognitive or behavioral impairments; participants exhibited performance deficits; assessment and treatment components were teacher-led; and examined tasks were of an academic nature. Although the current investigation seems to generally support previous findings in that providing students with choice-making opportunities seems to result in improved task-related behavior, additional research regarding the comparative effects of choice-related strategies is imperative.
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2012
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A Dissertation
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December 2012
DEDICATION

The writer would like to dedicate this work to her husband, Patrick Lee Burton, and her daughter, Lynlee Rose Burton. Thank you, Patrick, for your patience with this project and for helping me with some part of it each and every time I asked. You are a true partner to me in all the best ways. Thank you, my Lynlee, for sharing me with others so that this project could be completed. You are a daily reminder of my most important purpose in life.
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The writer would like to thank Dr. Heather Sterling for the patience she exhibited and the advice she shared throughout the ups and downs of this project. Dr. Sterling’s enduring support was invaluable to me. I would also like to thank Dr. Joe Olmi for his assistance and encouragement, particularly during the projects’ final stages. Dr. Olmi’s contributions were critical to the projects’ completion. The writer would also like to thank Dr. Dan Tingstrom and Dr. Brad Dufrene for their support and assistance in the project.

Special thanks go to the students and teachers who participated in the project. I would also like to thank the principal and superintendent who welcomed me into their school and district. The patience and generosity exhibited by all of these individuals are unmatched.
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LIST OF ABBREVIATIONS

ADHD…………………………………………….Attention Deficit-Hyperactive Disorder
AO........................................................................................................Abolishing Operation
ATD……………………………………………………..Alternating Treatments Design
BST……………………………………………………..Behavior Skills Training
CR…………………………………………………………Choice of Reward
CRCIC……………………………………Choice-Related Conditions Integrity Checklist
CTS……………………………………………………Choice of Task Sequence
EO…………………………………………………………Establishing Operation
FAIR-TA……………Functional Assessment Interview Record for Teachers - Academic
HP…………………………………………………………….High Probability
IOA……………………………………………………Interobserver Agreement
IRP-15……………………………………………..Intervention Rating Profile 15
LP…………………………………………………………….Low Probability
MO……………………………………………………Motivating Operation
NC…………………………………………………………No-Choice
ODD………………………………………………Oppositional Defiant Disorder
PND…………………………………………….Percentage of Nonoverlapping Data
VI…………………………………………………………Variable Interval
CHAPTER I
INTRODUCTION

For the last decade, there has been a movement in the field of school psychology for the use of positive behavior supports in the schools (Bambara, Mitchell-Kvacky, & Iacobelli, 1994). The reason for this movement is that such supports have been demonstrated by applied researchers to result in positive outcomes for students (Bohanon et al., 2006; Leedy, Bates, & Safran, 2004; Lewis, Powers, Kelk, & Newcomer, 2002). According to Shogren, Faggella-Luby, Bae, and Wehmeyer (2004), positive behavior support programs typically have two goals: (a) to redesign environments so that problem behavior is less likely to occur and (b) to teach students about appropriate behaviors so that they are successful over time and in multiple settings. Shogren et al. (2004) also pointed out that positive behavior support models emphasize the importance of promoting and enhancing self-determination. Self-determination can be described as the ability to make independent choices and decisions (Shogren et al., 2004).

Interventions aimed at increasing self-determination have attempted to enhance choice-making skills and opportunities (Algozzine, Browder, Karvonen, Test, & Wood, 2001). Enhanced opportunities for choice-making, in turn, have been associated with increased appropriate behaviors including adaptive behavior, work performance, task engagement, assignment accuracy, social or communicative behavior, and eye contact (Shogren et al., 2004). In addition, some researchers have suggested that higher levels of task engagement are associated with higher levels of academic performance (Heward, Courson, & Narayan, 1989; Heward et al., 1996) and lower levels of disruptive behavior (Greenwood, Horton, & Utley, 2002).
As a result of the correlations noted above, increasing task engagement is of particular interest to educators and other service providers working in schools. Fortunately, a host of strategies aimed at increasing students’ task engagement have been investigated. Some of the strategies examined include curricular modifications (Kern, Delaney, Clarke, Dunlap, & Childs, 2001), supplemental computer instruction (Ota & DuPaul, 2002), proximity (Wilczynski, Fusilier, Dubard, & Elliot, 2005), physical education (Medcalf, Marshall, & Rhoden, 2006), yoga (Peck, Kehle, Bray, & Theodore, 2005), self-monitoring (Amato-Zech, Hoff, & Doepke, 2006; Brooks, Todd, Tofflemoyer, & Horner, 2003; Dunlap et al., 1995), response cards (Berrong, Schuster, Morse, & Collins, 2007; Christie & Schuster, 2003; Godfrey, Grisham-Brown, Schuster, & Hemmeter, 2003), and choice-making opportunities (Bambara, Ager, & Koger, 1994; Cole, Davenport, Bambara, & Ager, 1997; Dunlap et al, 1994).

Although several strategies with the goal of increasing task engagement have been investigated, self-monitoring, response cards, and participant choice appear more frequently in the intervention-focused literature. Techniques incorporating self-monitoring generally require students to first observe and then record their own behaviors. Research indicates that self-monitoring techniques are generally successful for improving student behavior (Amato-Zech et al., 2006; Brooks et al., 2003; Dunlap et al., 1995). Additionally, self-monitoring interventions may be perceived favorably by teachers, because on the surface they appear to require little teacher involvement. There are some logistical problems associated with the use of self-monitoring techniques, however. For example, a fair amount of time must be spent training students how to
self-monitor as well as checking and rewarding accurate self-monitoring. Teachers must also have access to some materials (e.g., timer, recording sheets) in order to implement self-monitoring procedures in their classrooms.

Techniques incorporating response cards generally require students to respond to an instructor’s questions by writing or posting their answers on a response card. Research has demonstrated that response cards are generally effective for improving student behavior (Berrong et al., 2007; Christle & Schuster, 2003; Godfrey et al., 2003). In addition, these techniques may be perceived favorably by teachers because they appear to increase active responding and on-task behavior and decrease inappropriate behavior (Godfrey et al., 2003). Response cards, however, also have some associated logistical problems. Using response cards requires, for example, access to material resources. It is also necessary to train students how to use response cards.

Techniques incorporating choice generally involve allowing students to make some kind of selection related to task completion. The use of choice-related strategies has generally produced favorable results with regard to student outcomes (Kern, Mantegna, et al., 2001; Seybert, Dunlap, & Ferro, 1996; Watanabe & Sturmey, 2003). Choice-related strategies may be perceived favorably by teachers because they appear to increase student interest and independence (Kern, Bambara, & Fogt, 2002). They also appear to decrease problem behavior in the classroom (Dunlap et al., 1994). As with the other two techniques, there are some logistical problems associated with the use of choice-related strategies. These techniques require a fair amount of a priori planning, for example. Additionally, techniques incorporating choice generally require that teachers have access to many resources (e.g., task options, task materials, stimuli for reward). Because they are
specifically examined in the current investigation, literature on techniques incorporating choice will be reviewed in the following sections.

Literature on Techniques Incorporating Choice

Intervention techniques incorporating choice can be divided into two broad categories: antecedent and consequent. Antecedent techniques incorporating choice have generally involved allowing participants to make some kind of choice prior to completing a task. Several researchers have examined the effects of antecedent choice techniques on task engagement. That is, research has been conducted regarding the impact of choice of task (Bambara, Ager, et al., 1994; Cole et al., 1997; Killu, Clare, & Im, 1999); choice of task sequence (Kern, Mantegna, et al., 2001); choice of task and task sequence (Seybert et al., 1996; Watanabe & Sturmey, 2003); and choice of task, task sequence, and task-related materials (Kern et al., 2002). Consequent techniques incorporating choice have generally involved choice of preferred stimuli and reinforcers (Golonka et al., 2000; Lerman et al., 1997).

Some debate exists regarding the identification of the precise mechanism responsible for behavior change in the use of choice techniques (Kern, Mantegna, Vorndran, Bailin, & Hilt, 2001). One hypothesis is that behavior change is a result of the reinforcing properties that are inherent in the selected stimulus (Lerman et al., 1997). Another hypothesis is that behavior change is a result of the act of choosing itself (Fisher, Thompson, Piazza, Crosland, & Gotjen, 1997). Some researchers have postulated that choosing may act as a high-probability behavior that can be paired with a low-probability behavior (e.g., task engagement) to increase the occurrence of the low-probability behavior (i.e., the Premack Principle; Premack, 1959). Other researchers have postulated
that choosing may act as an abolishing operation (AO; Cooper, Heron, & Heward, 2007) in that it decreases the reinforcing effectiveness of engaging in problem behaviors during task time (Romaniuk et al., 2002). Despite the disagreement that surrounds these ideas, it seems clear that interventions incorporating choice are effective for changing behavior in desired ways. In the following sections, literature on antecedent and consequent techniques incorporating choice will be reviewed.

*Strategies Incorporating Antecedent Choice*

**Choice of Task.** Some researchers have investigated the effect of task selection on task engagement. In two studies, Bambara, Ager, et al. (1994) examined the task engagement of adults with severe or profound mental retardation. In the first study, the researchers used an alternating treatments design (ATD) to compare the engagement exhibited by three adults during high-preference assigned tasks, low-preference assigned tasks, and choice of high-preference or low-preference tasks (tasks included stamping, packing envelopes, filling folders, labeling, and sealing envelopes). Bambara, Ager, et al. (1994) utilized Mithaug and Hanawalt's (1978) pair-wise assessment to determine relative task preferences. In the high-preference assigned task condition, the participant completed a task that was indicated in the pair-wise assessment to be highly preferred. In the low-preference assigned task condition, the participant completed a task that was indicated to be a low-preference task. In the choice of high-preference or low-preference task condition, the participant selected either a high- or a low-preference task. The researchers did not state whether they provided reinforcement contingent on participant performance. Task engagement was defined as it had been in a previous investigation (Parsons, Reid, Reynolds, & Bumgarner, 1990). Participants were engaged in tasks when
they manipulated materials in a manner required to complete a task, requested assistance, or received feedback from the observer. The researchers used a 15-s momentary time sampling procedure to examine the mean percentage of intervals of task engagement. Task productivity (e.g., the number of envelopes packed) was not examined. Bambara, Ager, et al. (1994) found that engagement was higher during high-preference assigned task conditions \(M = 84\%\) and self-selected task conditions \(M = 76\%\). The researchers also reported that participants most often chose to complete high-preference tasks when the selection pool included high- and low-preference tasks \(70\% - 90\%\).

Bambara, Ager, et al. (1994) then conducted a follow-up study for the purpose of distinguishing between behavior change as a result of choice-making and behavior change as a result of receiving a desired outcome. Bambara, Ager, et al. (1994) used two tasks of similar preference (e.g., a researcher-selected low-preference task and a researcher-selected moderate-preference task) to compare the engagement of five adults in choice and no-choice conditions. First, the researchers selected two tasks to present to the participant. Then in the choice condition, the participant selected which one of the two tasks he or she would complete. In the no-choice condition, the participant was given a researcher-selected task to complete. As in the first experiment, the researchers did not indicate whether they provided reinforcement to participants contingent on their task performance. They defined and assessed task engagement in the same way they did in the first experiment. The researchers found no relationship between task engagement and type of task when comparing researcher-selected low-preference and moderate-preference tasks. This finding may indicate that there was less similarity between an individual’s low- and moderate-preference tasks than the researchers
assumed. Additionally, the external validity of these results is limited. Only adults with severe or profound mental retardation participated in the study, for example, and the tasks utilized were all related to daily living skills. Also, the researchers did not assess whether participants’ deficits were skill- or performance-related.

Other researchers have also looked at the effect of task choice on engagement. Cole et al. (1997) used an ATD to investigate how task type affected the engagement, problem behavior, and work productivity of three young males. Abe, Ben, and Sam served as participants. Abe was a 12-year-old with a pervasive developmental disorder and a developmental language disorder. Ben was a 13-year-old with Attention Deficit Hyperactivity Disorder (ADHD). Sam was an 11-year-old with a pervasive developmental disorder and a seizure disorder. First, the researchers conducted a preference assessment with each participant in order to identify preferred and nonpreferred tasks (tasks included stapling paper, sealing envelopes, bagging eating utensils, assembling pads of paper, and stuffing folders). Next, the participants were randomly exposed to three types of tasks: assigned-preferred tasks, assigned-nonpreferred tasks, and their choice of preferred and nonpreferred tasks. In the assigned-preferred task condition, the participant completed researcher-selected preferred task. In the assigned-nonpreferred task condition, the participant completed a researcher-selected nonpreferred task. In the choice of preferred or nonpreferred task condition, the participant selected a preferred or a nonpreferred task to complete. The researchers did not specify whether they provided reinforcement contingent upon the participants' task performances. Task engagement was defined as manipulating materials in a manner required to complete a task, requesting assistance, or receiving feedback from the
observer (Parsons et al., 1990). Engagement also included self-corrections, reaching for materials, waiting for new materials, and retrieving dropped materials. A 10-s momentary time sampling procedure was utilized to examine task engagement in five-min sessions. Disruptive behavior included inappropriate vocalizations, repetitive physical movements (e.g., sniffing materials, people, or objects), and physical actions that interrupted work and/or disrupted others (e.g., destroying property). A 10-s partial interval recording procedure was utilized to examine disruptive behavior in five-min sessions. The researchers also measured work productivity in two ways. Rate of task completion was defined as the total number of tasks completed per min during 15-min sessions. Rate correct was defined as the total number of tasks completed correctly per minute during 15-min sessions.

Cole et al. (1997) found that task engagement was generally highest for Abe, Ben, and Sam during the choice ($M = 84\%, \ M = 80\%, \ M = 80\%$, respectively) and assigned-preferred conditions ($M = 86\%, \ M = 80\%, \ M = 87\%$, respectively). Therefore, it appeared that participants responded most favorably in conditions that exposed them to preferred tasks. Participants’ disruptive behavior remained low across assigned-preferred ($M = 10\%$), choice ($M = 11\%$), and assigned-nonpreferred ($M = 11\%$) conditions. These data suggest that the conditions did not produce differential effects related to disruptive behavior. Rate of task completion and rate correct were highest for Abe and Ben in assigned-preferred ($M = 3.1$ and $M = 1.7$, respectively) and choice conditions ($M = 3.1$ and $M = 1.9$, respectively). Thus, it seems that Abe and Ben were both more productive in conditions that exposed them to preferred tasks. Sam, however, performed similarly across assigned-preferred ($M = 3.2$), choice ($M = 3.0$), and assigned-nonpreferred
(\(M = 2.1\)) conditions. There were no differential effects across conditions, therefore, in Sam’s productivity.

There were some limitations to the study (Cole et al., 1997). First, a baseline phase was not included in the investigation. Thus, pre-treatment levels of disruptive behavior were unknown, and it was impossible to determine whether the observed low levels were a result of the preference and choice components of the study. Additionally, work productivity was variable across participants. Although all three participants completed more tasks correctly during choice and assigned-preferred conditions, there were differences among them regarding how quickly and accurately they worked. Abe appeared to sacrifice accuracy for speed; Ben worked slowly and inaccurately; and Sam worked both quickly and accurately across all phases. As a result of the variability present in the data, the researchers noted that conclusions about work productivity were limited. They encouraged future researchers to attempt to control for variability across tasks. The external validity of these results was limited because the participants were all young adolescent males with disabilities and all tasks used in the investigation were related to daily living skills. Additionally, the researchers did not assess whether participants’ deficits were related to skill- or performance-deficits.

Still other researchers have examined how task choice impacts engagement. Killu et al. (1999) used a time series design to compare the effects of several variations of task choice and task preference on the on-task behavior of three middle school-aged boys in self-contained special education classrooms during academic tasks. Eldon (12 years, 10 months) and Keith (12 years, 6 months) were labeled as learning disabled, and Jeremy (13 years, 4 months) was developmentally delayed and labeled as mentally impaired. All
of the students displayed frequent off-task behaviors during spelling tasks. The researchers first conducted pairwise preference assessments with each of the participants to identify the five most-preferred spelling tasks as well as the five least-preferred spelling tasks. That is, the researcher presented each student with pairs of spelling tasks and asked him which he would prefer to do. Every possible pair of tasks (involving 20 familiar spelling tasks) was presented to the student twice so that a total of 380 presentations were made with each participant. Killu et al. then evaluated the following six experimental conditions: (a) choice of preferred task, (b) choice of nonpreferred task, (c) no choice of preferred task, (d) no choice of nonpreferred task, (e) no choice of preferred task (yoked control), and (f) no choice of nonpreferred task (yoked control). In the choice of preferred task condition, the researcher presented the student with five notecards labeled with his most-preferred spelling tasks. The student was then instructed to select one of the tasks to complete. In the choice of nonpreferred task condition, the researcher presented the student with five notecards labeled with his least-preferred spelling tasks. The student was then instructed to select one of the tasks to complete. In the no choice of preferred tasks condition, the researcher randomly selected one of the student’s preferred tasks and instructed him to complete it. In the no choice of nonpreferred task condition, the researcher randomly selected one of the student’s nonpreferred tasks and instructed him to complete it. In the no choice of preferred task (yoked control) condition, the researcher presented the student with the same tasks (in the same order) that he had selected during the choice of preferred task condition. In the no choice of nonpreferred tasks (yoked control) condition, the researcher presented the student with the same task (in the same order) that he had selected during the choice of
non-preferred task condition. Task engagement was defined as working on task options in accordance with instructions, looking at materials during assignments, looking at the teacher during verbal instruction, manipulating materials related to assignment completion, and asking the teacher questions directly related to the assignment. A 10-s partial interval recording procedure was utilized to examine engagement in 30-min sessions. Task productivity (i.e., the amount of work completed) was not examined.

Killu et al. (1999) found that task engagement was highest for Eldon, Keith, and Jeremy in conditions involving preferred tasks, despite the presence or absence of a choice-making opportunity related to the tasks. The researchers also found that offering task choices to the participants did not result in any additional increases in task engagement above those obtained using preferred tasks. The external validity of the results was limited because only male adolescents with disabilities (i.e., learning disabilities, developmental delays, mental impairments) participated in the study. In addition, all students were enrolled in self-contained special education classrooms. The researchers did not assess whether participants’ deficits were skill- or performance-related.

Existing research regarding the effects of choice of task on task engagement is not conclusive. Although some of the research indicates that allowing students to select which tasks they complete has a positive influence on task engagement (Cole et al., 1997), other research suggests that opportunities for choice-making do not produce benefits that are above and beyond consideration of task preference (Killu et al., 1999). However, some consistent limitations across the body of research should be noted. Bambara, Ager, et al. (1994) and Killu et al. (1999) did not examine task productivity
(i.e., the amount of work completed). Cole et al. (1997) did not examine disruptive behavior prior to the implementation of treatment. The external validity of this research was limited by several factors. First, most of the participants in the studies reviewed were either adolescent or adult males with disabilities. In addition, two of the three studies examined task engagement during activities of daily living. It is also important to note that only one of the studies (Cole et al., 1997) examined the effect of task choice on task productivity. Therefore, no conclusions can be drawn regarding the influence of task choice on productivity. Additionally, the nature of participants’ deficits (skill vs. performance) was not evaluated in any of the studies examined.

Choice of Task Sequence. In the work discussed in the previous section, researchers examined the impact of choice of task on task engagement. Other researchers, however, have examined the impact of choice of task sequence on task engagement. Kern, Mantegna, et al. (2001) used simple phase change designs to investigate the effects of choice of task sequence on problem behavior and task engagement. Danny, Kelly, and Shannon participated in the study. Danny was a seven-year-old male diagnosed with ADHD. Kelly was a 15-year-old female diagnosed with moderate mental retardation and tuberous sclerosis. Shannon was an 11-year-old female diagnosed with mild mental retardation, ADHD, and obesity. In the no-choice condition, the participant completed tasks in a researcher-selected, random order. In the choice condition, the participant indicated the sequence in which he or she would complete tasks. Participants also had the option of changing the task completion sequence at any time during the choice condition. Several task options were available to the participants. Danny's task options included math worksheets, flashcards, and cut-and-paste activities. Kelly's task options included
throwing away lunchtime trash, wiping her desk, and cleaning her hands and face with a
towelette. Shannon’s task options included making her bed, folding her laundry, and
cleaning tables. Physical guidance was used in instances of noncompliance throughout
the study. When physical guidance became necessary, engagement was not recorded. The
researchers did not disclose whether reinforcement was provided contingent upon task
performance. The primary dependent variable for Danny was problem behavior. Problem
behavior included throwing objects, destroying property, banging on tables with objects
or fists, cursing, and screaming. A frequency count was utilized to examine changes in
Danny’s problem behavior. Engagement included making eye contact with the instructor
during verbal instruction or completing the assigned task as directed by the instructor. A
duration measure was utilized to examine Danny’s task engagement. The primary
dependent variable for Kelly was task engagement. Engagement was defined as making
physical movements in a manner necessary to complete the task. A 10-s whole interval
recording procedure was utilized to examine task engagement. No other variables were
examined with Kelly. The primary dependent variable for Shannon was problem
behavior. Problem behavior included aggression, throwing objects, destroying property,
screaming, and flopping. A frequency count was utilized to examine all of Shannon’s
problem behaviors other than flopping. A duration measure was utilized to examine
flopping. No other variables were assessed with Shannon. Participants’ (i.e., Danny and
Shannon) problem behaviors were later collapsed and reported using 10-s partial interval
recording procedures.

Kern, Mantegna, et al. (2001) found that allowing participants to select task
sequence resulted in decreased problem behavior for Danny and Shannon, as well as
increased task engagement for Danny and Kelly. Some limitations, however, must be noted. Treatment occurred in an inpatient hospital for two of the three participants, for example, and task engagement and problem behavior was examined during activities of daily living for two of the three participants. It is important to note that improvements in task engagement during academic tasks were observed for Danny. Additionally, physical guidance was used in conjunction with choice-related strategies; therefore, escape extinction may have accounted for some of the observed effects. Researchers did not assess whether participants’ deficits were skill- or performance-related.

Although existing research suggests that selection of task sequence may improve task engagement, only one study (Kern, Mantegna, et al., 2001) to date examined the influence of choice of task sequence alone on task engagement. Unfortunately, the research that has been conducted has some limitations. For most participants, Kern, Mantegna, et al. examined task engagement during tasks of daily living and in inpatient settings. The researchers also used physical guidance in combination with choice-related strategies. The nature of participants’ deficits (skill vs. performance) was not evaluated. There is a great need, therefore, for additional research to address these limitations. In the following section, the effects of selection of task, task sequence, and task-related materials on task engagement will be reviewed.

**Choice of Task and Task Sequence.** In the previous two sections, research examining the effects of choice of task alone and choice of task sequence alone was discussed. Some researchers, however, have investigated the combined influence of choice of task and choice of task sequence on task engagement. Dunlap et al. (1994) examined the effects of choice of task and task order on the task engagement and
disruptive behavior exhibited by children with emotional disabilities. The researchers used simple phase change designs to track the task engagement and disruptive behavior of two 11-year-old males (Wendall and Sven). In the no-choice condition, the participant completed teacher-selected academic assignments in a specified sequence. In the choice condition, the student selected assignments to complete from a menu. The students also selected the sequence in which they would complete tasks. The researchers did not disclose whether reinforcement was provided in no-choice or choice conditions contingent upon the participants' task performance. The students all had several academic task options available. Wendall's task options included completing English textbook unit work, English worksheets, and paragraph exercises. Sven's task options included writing, alphabetizing, and defining spelling words, and completing spelling workbook pages and spelling worksheets. Task engagement was defined as working on an assigned activity in accordance with instructions. Having eyes on materials during written or manipulative assignments or on the teacher during verbal instruction was also included in the definition of task engagement. For Wendall, disruptive behavior included vocal or nonvocal noise making, leaving his seat without permission, talking out in a manner unrelated to the assigned task, and exhibiting noncompliant behavior. A 15-s continuous interval procedure was utilized to examine Wendall’s task engagement and disruptive behavior during 15-min sessions. For Sven, disruptive behavior included talking out without staff permission, vocal or nonvocal noise making, leaving his seat without permission, destroying property, and noncompliance. A 10-s observe, five-s record partial interval recording procedure was utilized to examine Sven’s task engagement and disruptive behavior for 15 min sessions.
Dunlap et al. (1994) found that task engagement was highest and disruptive behavior was lowest in choice conditions for both Wendall and Sven. The results were limited, however, because the participants’ preferences for particular tasks or for particular task sequences may have influenced outcomes. Thus, choice-making may not have been the sole cause of behavior change. The external validity of the results was limited because both participants were 11-year-old males with emotional disabilities. Researchers did not assess whether participants’ deficits were skill- or performance-related.

In another experiment, Dunlap et al. (1994) used a simple phase change design to assess the effect of participant selection of task materials on task engagement and disruptive behavior. This investigation was a second experiment in the researchers’ study that was discussed above. The experiment served as an attempt to isolate the effects of preference from choice-making. Ahmad, a five-year-old male with an emotional disability, participated in the investigation. In the no-choice condition, Ahmad attended to a story read by his instructor. Afterward, he participated in a discussion about the story. The second no-choice condition was yoked to the results of the first no-choice condition in an attempt to isolate the effects of preference from the effects of choice-making. In the choice condition, Ahmad selected the story that he wanted to hear and then participated in a discussion about the story. The researchers indicated that Ahmad received praise throughout the study for engaging in appropriate listening and participation. Additionally, occasional verbal prompts were issued (e.g., "I really like it when children listen and pay attention.") to promote Ahmad's task engagement. Task engagement was defined as
sitting quietly and attending to the story being read. Being physically oriented toward the book and teacher, asking relevant questions, and responding verbally to questions or task-related statements were included in the definition of task engagement. Disruptive behavior included leaving his seat, destroying property, and engaging in aggression, negative verbalizations, or noncompliance. A 10-s observe, five-s record partial interval recording procedure was utilized to examine both task engagement and disruptive behavior. Dunlap et al. found that Ahmad’s task engagement was highest (approximately 95% - 100%) and disruptive behavior was lowest (approximately 0% - 5%) during choice conditions. Because the researchers used a yoking procedure to control for preference across conditions, some conclusions can be drawn about their results. The effects of choice were fairly clear in that the participant’s task engagement and disruptive behavior were both most desirable during choice conditions. In fact, there was little to no overlap in the data between choice and no-choice conditions. The results were limited, however, because the researchers’ use of praise and verbal prompts may have resulted in an interaction that confounded the independent effects of choice-making on task engagement and disruptive behavior. In addition, given that their experiment included only one young male with emotional disabilities, the generalizability of the researchers’ findings may be limited. Researchers did not assess whether Ahmad’s deficits were skill- or performance-related.

*Choice of Task, Choice of Task Sequence, and Choice of Task-Related Materials.* Other researchers have investigated the combined influences of choice of task, choice of task sequence, and choice of task-related materials on task engagement. Seybert et al. (1996) used a multiple baseline across participants design with an embedded withdrawal
to examine the effects of choice-making on the problem behavior and task engagement of three high school students with moderate to severe mental retardation. Scott was a 14-year-old male; Bob was a 15-year-old male; and Maria was a 21-year-old female. In the no-choice condition, the participant completed two teacher-selected tasks in a specified order. In the choice condition, the participant completed two tasks that he or she selected in the order that he or she desired. Tasks for all participants included cleaning tables, nuts and bolts assembly, coupon assembly, rolling silverware, and sweeping. Problem behavior included any response that interfered with task performance, was disruptive to the context, or was considered inappropriate for a typical school setting (e.g., self-stimulation, inappropriate use of task materials, inappropriate vocalizations). Task engagement was defined as working on the prescribed task and using the materials correctly for at least 5 consecutive s within an interval. A 10-s observe, five-s record partial interval recording procedure was utilized to examine both problem behavior and task engagement.

Seybert et al. (1996) found that in no choice-conditions, problem behavior averaged 60%, 37%, and 16% for Scott, Bob, and Maria, respectively. In choice conditions, problem behavior averaged 37%, 14%, 4%, for Scott, Bob, and Maria, respectively. These data suggested that problem behavior was lowest for all participants in choice conditions. Visual inspection indicated that although the choice conditions did not necessarily produce increases in the participants’ levels of task engagement; it was generally more stable during choice conditions. Some limitations of the investigation (Seybert et al., 1996) must be mentioned. Students showed clear preferences for some tasks in the choice condition, for example, whereas all tasks were considered neutral at
the outset of the study. Neutral tasks were those perceived by teachers to be neither favored nor shunned by the students. Therefore, teacher perception may not have been the most reliable method of assessing students’ task preferences. In addition, the external validity of the results was limited because participants were all adolescents or adults, and all had moderate to severe mental retardation. Furthermore, the tasks utilized in the investigation were primarily activities of daily living. Neither task productivity nor the nature of participants’ deficits (skill versus performance) was assessed.

Still other researchers have investigated the combined influences of choice of task, choice of task sequence, and choice of task-related materials on task engagement. Kern et al. (2002) used a withdrawal design to look at the role of choice-making on the task engagement and destructive behavior exhibited by six adolescents with severe behavior problems. All participants were 13 to 14 years of age and all attended a science class that lasted 40 min per day. In the no-choice condition, the teacher used his traditional style of instruction. That is, he selected and directed all academic activities. In the choice condition, the teacher provided two to three opportunities for group choice-making throughout the lesson, as well as at least one opportunity for individual choice-making. Group choice-making opportunities related to tasks, materials, and task sequence and all were made using a class-wide voting system. Individual choice-making opportunities were related to task or task materials. However, the researchers did not indicate how individual choice-making opportunities were presented or carried out. Additionally, the choice condition incorporated activities that were rated by both teachers and students as high-interest. The researchers did not disclose whether participants’ task performance was reinforced. Task engagement included having eyes directed toward the
teacher or task materials, completing work in accordance with the teacher’s directions or instructional requirements. A 10-s partial interval recording procedure was utilized to examine task engagement. In order for engagement to be recorded, a student had to exhibit the defined behavior for at least five of the 10 s in the interval. Destructive behavior included aggression, disruption, destroying property, cursing, screaming, spitting, and leaving the classroom without permission. A 10-s partial interval recording procedure was utilized to examine destructive behavior. Class-wide behavior was observed using a rotational procedure whereby individual students were randomly assessed for one minute periods. The procedure was repeated for a total of approximately 28 minutes each session.

Kern et al. (2002) found that task engagement was generally higher in choice conditions ($M = 87\%$ and $89\%$) when compared to no-choice conditions ($M = 57\%$ and $63\%$). Destructive behavior was generally lower in choice conditions ($M = 1\%$ and $0\%$) when compared to no-choice conditions ($M = 8\%$ and $12\%$). These data suggested that both task engagement and destructive behavior were improved in choice conditions. However, some limitations to the results must be considered. For example, the researchers looked at the combined effects of providing choice-making opportunities and presenting high-interest activities; thus, Kern et al. (2002) were unable to draw conclusions about the individual effects of the intervention components. Another limitation was that student preference ratings did not vary a great deal between the baseline and intervention phases. The researchers suggested that because student preference ratings were already high during baseline, a ceiling effect may have occurred. Additionally, other systems of behavior management may have influenced student
behavior when the study took place. Although it was held constant during the study, students were exposed to school- and class-wide behavior management systems in place since the beginning of the academic year. Thus, carryover effects from either of these behavior management systems may have influenced student behavior. In addition, the external validity of these results was compromised because the participants were all adolescents with severe behavior problems. The researchers did not assess whether participants’ deficits were skill- or performance-related.

Other researchers have also investigated the combined influences of choice of task, choice of task sequence, and choice of task-related materials on task engagement. Watanabe and Sturmey (2003) used a multiple baseline across participants design to examine the impact of choice-making related to task and task order on the on-task behavior exhibited by three adult males with Autism. Mark, Bob, and Nick (ages 22, 40, and 30, respectively) participated in the study. All attended an adult services program for individuals with developmental and behavioral disorders. During the baseline phase of the study, the experimenter wrote the work schedule that the participants were to follow on a blackboard. That is, the participants were to complete three tasks (tasks included, but were not limited to math drills, reading comprehension, handwriting practice, personal hygiene check, job search, and letter-writing) in a specified order during a 40-min work period (five- to 10-min breaks occurred between tasks). The experimenter verbally prompted the participants when to work and when to take breaks. He or she also provided verbal praise to the participants when they completed tasks during the scheduled time period. If a participant finished a task before the allotted time period expired, he was allowed to take a long break until the next task began. If a participant failed to complete a
task before the allotted time period expired, he was instructed to take the break and then begin the next task. Procedures in the intervention phase were similar to those in the baseline phase of the study. Instead of writing the task schedule on the blackboard, however, the experimenter provided each participant with a list of nine tasks and asked them to create their own work schedules. That is, the participants were instructed to select three tasks and write them in the order that they would be completed. The researchers also included a maintenance phase that was very similar to the intervention phase. In the maintenance phase, however, the experimenter did not provide any prompts to the participants. On-task behavior included reading the task paper or activity schedule sheet, writing on paper or the activity schedule sheet appropriately, correcting writing with an eraser, walking toward a drawer to get a pencil and walking back to the seat, going to the next room to use a pencil sharpener, and asking questions about the task. A one-min momentary time sampling procedure was utilized to examine on-task behavior during a 30-min session.

Watanabe and Sturmey (2003) found that Mark’s time on task averaged 19.4% in baseline, 50.8% in the choice condition, and 59.0% in the maintenance condition. Bob’s time on task averaged 23.9% during in baseline, 67.5% in the choice condition, and 63.6% in the maintenance condition. Nick’s time on task averaged 40.8% in baseline, 58.6% in the choice condition, and 76.7% in the maintenance condition. These data suggested that allowing Mark, Bob, and Nick to select the tasks that they would complete as well as the order in which they would complete them increased the participants’ task engagement. Anecdotally, the researchers also noted decreases in inappropriate behavior and increases in productivity across participants. There were, however, some limitations
to the study. First, the activity schedules took different forms in the baseline and intervention phases. Participants may simply have preferred looking at their schedules on their desks rather than on a blackboard. Another limitation was the fact that there was a two-month time gap in the middle of the intervention phase. Although it appears that the data were unaffected by the time gap, the possibility of the influence of extraneous variables cannot be ruled out. The results of the study were also limited because choice-related strategies were used in conjunction with contingent praise and schedule breaks. Therefore, the role of choice-related strategies alone was unknown. The external validity of the results was limited because the participants were all adult males with Autism attending an adult services program. The nature of participants’ deficits (skill vs. performance) was not assessed.

Existing research indicates that selection of task, selection of task sequence, and selection of task-related materials may have a positive impact on desirable and undesirable behavior. However, this body of research is somewhat limited. First, there were several procedural problems in the reviewed studies. Seybert et al. (1996) used potentially erroneous preference assessment strategies and did not examine task productivity. In the study conducted by Kern et al. (2002), other treatment techniques were in place in addition to the choice-related techniques (e.g., use of high-interest activities, class- and school-wide behavior management systems). Watanabe and Sturmey (2003) had inconsistencies between conditions, a large time gap within an experimental condition, did not examine task productivity, and looked at a combination of treatment strategies. These procedural problems may have impacted results. External validity was also compromised because the participants in these studies were primarily adolescent or
adult males with mild to severe disabilities. Additionally, task engagement during academic tasks was only examined in two studies (Kern et al., 2002; Watanabe & Sturmey, 2003). It is important to note, however, when task engagement was examined during academic tasks, improvements were observed. The nature of participants’ deficits (skill vs. performance) was not evaluated in any of the studies examined. Clearly, additional research in the area of participant selection of task, task sequence, and task-related materials seems warranted.

*Summary of Literature on Antecedent Techniques Incorporating Choice*

Existing research indicates that antecedent techniques incorporating choice may positively influence participants’ task engagement. However, the extant body of research has several important limitations. One limitation was that only a few researchers have looked at the effects of antecedent choice-related strategies in general. Thus, the research needs to be expanded. Additionally, although a few different types of antecedent choice-related strategies have been examined (i.e., choice of task; choice of task sequence; choice of task and task sequence combined; choice of task-related materials; choice of task, choice of task sequence, and choice of task-related materials combined), most of the unique strategies have been examined in only a single study. Another limitation was that researchers often investigated techniques with multiple antecedent choice-related components. Therefore, little was known regarding the effects of the individual techniques. A related limitation was that several researchers examined the effects of choice-related strategies in combination with other behavior management techniques (e.g., praise, physical guidance, class-wide behavior management system). Again, this is problematic because the effects of choice-making alone were unclear. The
external validity of this area of research was also severely limited. That is, adolescent or adult males with disabilities were the most common participants. Treatment settings were often not representative of typical classrooms and tasks examined were often not academic in nature. Additionally, the nature of participants’ deficits (skill vs. performance) was not assessed in any of the studies examined. As a result of these limitations, little is known about the effects of antecedent strategies incorporating choice for younger children, for female children, for children without disabilities, for children with performance deficits, for children who attend typical school settings, and for children who work on more traditional academic tasks. This information is important because school districts are mandated to provide educational services to all children. Therefore, it is vital that service-providers be aware of how antecedent choice-related techniques are best utilized. Service-providers might also benefit from learning more about consequent strategies incorporating choice.

*Literature on Consequent Techniques Incorporating Choice*

Some researchers have investigated the effects of consequent techniques incorporating choice. Lerman et al. (1997) used ATDs and multiple baseline across participants designs with embedded ATDs to examine the frequency of task-related responding in choice and no-choice conditions related to the receipt of preferred stimuli. Participants (ages four to 39) included four children (Adam, Frank, Jim, and Brad) and two adults (Carl and Sue). All participants had diagnoses of severe to profound mental retardation. The researchers first conducted preference assessments with all of the participants to identify their five most highly preferred stimuli. Next, they introduced the choice and no-choice conditions. In choice conditions, participants selected one of two
preferred stimuli contingent on the emission of a target response (Target responses included pressing a microswitch, stamping the date on a piece of paper, and placing chips in a Connect Four® game.). In no-choice conditions, the researchers selected and presented a preferred stimulus to the participant contingent on the emission of a target response.

Lerman et al. (1997) found that the opportunity for contingent choice-making did not improve participants’ frequency of task response when stimuli were all highly preferred. There were, however, some limitations to the study. One limitation was that participants had prior exposure to high-preference stimuli in their instructional programs. Therefore, participants may have responded more favorably to the receipt of the stimuli if it had been a novel event. Another limitation was that participants selected from only two stimuli. Thus, participants may have responded more favorably in choice conditions if the selection pool had been bigger. The results were also limited because high-preference stimuli were available during both choice and no-choice conditions. This may have produced a ceiling effect in the frequency of task response. The researchers suggested that opportunities for choice-making may be less salient when all stimuli in the selection pool are highly preferred. In addition, the external validity of the study was limited because all of the participants were individuals with severe to profound mental retardation. The target responses in this study were also different from what might be expected in a typical school setting. The nature of participants’ deficits (skill vs. performance) was not evaluated.

Other researchers have also investigated the effects of consequent techniques incorporating choice. Golonka et al. (2000) used an ATD to examine the influence of
selection of break type on the appropriate and inappropriate behavior of two participants. Both participants, Liz and Lucy (ages 12 and 30, respectively), exhibited aberrant behavior that was demonstrated in prior assessments to be maintained by negative reinforcement. Although the researchers did not specify the type of negative reinforcement that maintained aberrant behavior for participants in prior assessments, it is assumed that the authors are referring to some sort of escape or avoidance of task demands. In the first phase of the experiment, participants were presented with a demanding task and then had the opportunity to continue working or to mand for a break. In break alone conditions, participants took breaks at a small table and did not have access to social and leisure activities. In enriched environment break conditions, participants took breaks with access to social and leisure activities. During the second phase of the experiment, participants were presented with a demanding task and then had the opportunity to continue working, to mand for a break alone, or to mand for an enriched break. Appropriate behavior was defined as completing task demands without physical guidance. Inappropriate behavior included kicking and hitting others, head hitting, hand biting, and screaming. A 6-s partial interval recording procedure was utilized to examine both appropriate and inappropriate behavior.

Golonka et al. (2000) found that both participants manded more often and spent more time in enriched breaks. The researchers also found that the type of break affected choice-making behavior and resulted in increased appropriate behavior for both participants. The results were limited, however, because the participants both exhibited aberrant behavior that was maintained by negative reinforcement. No conclusions can be drawn regarding how participants with aberrant behavior maintained by other variables
might have responded. Additionally, the investigation occurred in outpatient and inpatient clinic settings. The nature of participants’ deficits (skill versus performance) was not evaluated.

Existing research suggests that selection of stimuli or consequences contingent on target behavior may positively impact behavior (Golonka, 2000; Lerman et al., 1997). However, this area of research is limited because the influence of choice-making related to stimuli or consequences alone was unclear. That is, the overall impact was confounded because participants also expected to receive preferred stimuli or consequences.

Some researchers have tried to isolate the effects of choice-making with respect to stimuli selection in order to address limitations reported in similar research. Fisher et al. (1997) conducted two reinforcer assessment experiments with three children who exhibited destructive behavior or presented with feeding disorders. Lindsay, Sammy, and Jessica served as participants in the study. Lindsay was an eight-year-old girl with mild mental retardation, ADHD, and oppositional defiant disorder (ODD). Sammy was a 13-year-old boy with moderate mental retardation. Jessica was a 10-year-old girl with a chromosomal abnormality (10q deletion syndrome), mild mental retardation, and ADHD.

Prior to conducting the reinforcer assessment experiments, the researchers conducted interviews with each participant’s caregivers. The interviews were used in the identification of potential reinforcers for the participants. Next, stimulus choice assessments were conducted with each participant. The assessment was used to create a hierarchy of preferred stimuli. Specifically, the researchers were interested in identifying the two highest- and two lowest-preferred stimuli. In the first experiment, Fisher et al. (1997) used a simple phase change design to assess participants’ key presses on a
microswitch (i.e., a novel task) across high-preference (HP), low-preference (LP), and high- and low-preference (HP & LP) phases. In each phase, participants selected one of three randomly-ordered keys. Pressing Key 1 (choice key) after a variable interval (VI) elapsed, resulted in the opportunity for the participant to select one of two high-preference stimuli (HP phase), two low-preference stimuli (LP phase), or one high- and one low-preference stimulus (HP & LP phase). Pressing Key 2 (no-choice key) after a VI elapsed resulted in the receipt of one researcher-selected high-preference stimulus (HP phase), one researcher-selected low-preference stimulus (LP phase), or one researcher-selected high- or low-preference stimulus (HP & LP phase). Pressing Key 3 (control key) after VI elapsed resulted in no consequence. Fisher et al. (1997) found that all three participants pressed the choice key almost exclusively. They also found that participant responding was similar across HP, LP, and HP & LP phases. The findings suggested that the act of choosing was preferred by Lindsay, Sammy, and Jessica, even if participants had to select between two low-preference stimuli. The results of the first reinforcement experiment were confounded, however, because high-preference stimuli were presented on a VI schedule, which may have increased participants’ frequency of task responses. In addition, the external validity of the findings is limited because tasks were not socially valid. That is, key-pressing does not appear to be an important task for daily social, occupational, or academic functioning. Additionally, the tasks did not take place in an applied setting.

In their second experiment, Fisher et al. (1997) attempted to isolate and examine participants’ responses to choice-making. The HP and LP phases were conducted in the same way they were in the first experiment. The HP & LP phase was divided, however.
Lindsay and Jessica experienced the Choice = LP/No Choice = HP & LP phase. In this phase, pressing the choice key after a VI elapsed resulted in participant selection of one of two low-preference stimuli. Pressing the no-choice key resulted in the delivery of a researcher-selected high- or low-preference stimulus. Sammy experienced the Choice = LP/No Choice = HP & LP phase. In this phase, pressing the choice key after a VI elapsed resulted in participant selection of one of two low-preference stimuli. Pressing the no-choice key resulted in the delivery of a researcher-selected high-preference stimulus. Fisher et al. (1997) found that participants consistently selected the choice key, so as long as the resulting stimuli matched those made available by pressing the no-choice key. In addition, if the stimuli made available by pressing the no-choice key were more highly preferred than those made available by pressing the choice key, the participants selected the no-choice key. There were some limitations to the study, however. One limitation was that tasks were novel and not socially valid. Therefore, no conclusions can be drawn regarding how participants might have responded if tasks had been familiar and/or functional. Another limitation was that the study took place in an analog rather than applied format. Thus, no conclusions can be drawn regarding how participants might perform in a more natural setting (e.g., classroom). The external validity of the study was limited because participants were all individuals with disabilities (i.e., mild or moderate mental retardation, ADHD, ODD, chromosomal abnormality).

As previously discussed, the goal of the work conducted by Lerman et al. (1997) was to make the effects of stimuli selection more salient by providing choice-making opportunities contingent on responding. Tiger, Hanley, & Hernandez (2006), however, aimed to assess the preference for choice-making when choice as an independent variable
was highly controlled. In four studies, the researchers examined choice-making behavior among preschool children (ages 2.5 to 5.5). Preferred stimuli in the study were held constant within and across choice and no-choice conditions so that participants’ preferences for choice-making could be evaluated. The researchers first conducted preference assessments with the participants so that they could identify three to four stimuli that were most preferred. Stimuli were rotated from session to session throughout the study, but they were held constant within sessions. In the first experiment, participants experienced three conditions in an ATD format: choice, no-choice, and control. Each condition was represented by a specific color of paper, and the participants selected one to determine the condition that would ensue. In the choice condition, the participant emitted a correct response on an academic task and then selected one of five identical edible stimuli (e.g., M&Ms®). In the no-choice condition, the participant emitted a correct response and was then provided with an edible stimulus that was identical to the one used in the choice condition. In the control condition, however, the participant did not receive an edible stimulus, regardless of correct responding. Praise was provided to the participant as a result of correct responding in all three conditions. Tiger et al. (2006) found that five of the six participants selected the choice condition most often. However, two of the five participants’ selection of the choice condition decreased over time. These findings suggest that if the outcome of choice-making remains constant over time, choice-making opportunities related to stimuli may lose their value for some individuals. The researchers also found that one participant selected the no-choice condition most often. The results of this experiment were limited, however, because the individual influence of praise is not known.
In their second experiment, Tiger et al. (2006) examined the effect of stimulus quantity on choice-making. As before, the participant first had to emit a correct response in an academic task. Next, he/she selected a colored piece of paper that represented one of three conditions (2 choice, 1 no-choice). If a participant selected the orange paper, he/she selected one of four edible stimuli. If a participant selected the blue paper, he or she selected one of two edible stimuli. If a participant selected the yellow paper, he or she received no edible stimuli. Praise was provided to the participant as a result of correct responding in all three conditions. In addition, the number of selection pool was systematically increased from 4, to 8, to 12, and then to 16 stimuli. Tiger et al. found that participants most often selected conditions that involved greater quantities of stimuli. They also found that preference for choice-making increased as the selection pool increased. As before, however, these results are potentially confounded by the inclusion of contingent praise.

Two participants in the first experiment did not show a consistent preference for choice conditions. In a third experiment, therefore, Tiger et al. (2006) attempted to establish choice as a preference for the participants. The researchers used a simple phase change design embedded in an ATD and with multiple baseline across participants design components in the experiment. In the no-choice condition, the participant emitted a correct response in an academic task and was then provided with one edible stimulus. In the choice condition, the participant emitted a correct response and then selected one stimulus from a pool. The pool was increased from five edibles in the first phase, to 10 edibles in the second phase, and then to 15 edibles in the third phase. Tiger et al. found that participants most often selected the no-choice condition when the selection pool
contained only five stimuli. As the number of edibles in the pool increased, however, the participant selected the choice condition most often. The researchers did not report whether praise was provided contingent upon correct responding.

In their fourth experiment, Tiger et al. (2006) used procedures that were very similar to those in the third experiment. In order to access the choice condition, however, the participant had to complete an increasing number (1 to 32) of academic tasks. In order to access the no-choice and control conditions, participants had to complete only one task. Tiger et al. found that the participants preferred the choice condition, even in the presence of greater response effort. These results were, however, limited. One limitation was that the amount of the stimulus was greater in the choice condition than in the no-choice condition. Thus, effects related to the magnitude of the stimulus cannot be ruled out completely.

Summary of Literature on Consequent Techniques Incorporating Choice

Research indicates that consequent intervention techniques incorporating choice have been successful for improving behavior (Golonka, 2000). Researchers have also found that children generally prefer opportunities for choice-making (Fisher et al., 1997; Tiger, 2006). Unfortunately, much of the existing research has limitations. For example, Lerman et al. (1997) used tasks that were not academic in nature, they examined participants with severe to profound mental retardation, and they did not assess whether participants deficits were skill- or performance-related. Thus, little can be said in regard to how their findings would hold up in an academic setting, with participants without disabilities, or with participants with performance deficits. Golonka et al. (2000) examined participants in inpatient and outpatient settings whose aberrant behavior was
maintained by negative reinforcement. As a result, it is unclear whether their findings would relate to children in a classroom, to children whose problem behavior is maintained by positive reinforcement, or to children with performance deficits. Fisher et al. (1997) used tasks that were novel and not socially valid. The researchers also examined participants with disabilities in an analog format. Therefore, it remains to be seen whether their results would generalize to a situation involving familiar, socially valid tasks, to participants without disabilities in a regular education classroom, or to participants with performance deficits. Tiger et al. (2006) combined choice-related strategies with praise and had some inconsistencies across conditions (e.g., the quantity of stimuli differed across conditions). Thus, no conclusions can be drawn about the effects of choice-related strategies alone. It is clear that additional research needs to be conducted in order to address some of these limitations. School personnel are required to provide services for all students. Therefore, they would benefit from knowing how all students respond to consequent-based choice-related strategies. They would also benefit from knowing how consequent-based choice-related strategies are most effectively used in typical school situations.

Purpose

As a result of the demonstrated effectiveness of positive behavior supports, there is a movement among school psychologists for the use of such supports in schools. Proponents of positive behavior support strategies have emphasized the importance of increasing students’ self-determination (Shogren et al., 2004). Self-determination is the ability to make choices and/or decisions independently. Self-determination may be strengthened, therefore, when choice-making skills and opportunities are enhanced.
Choice-making opportunities have been shown to result in many positive outcomes for students, including increased task engagement. High levels of task engagement, in turn, have been shown to result in high levels of academic performance (Heward et al., 1989; Heward et al., 1996) and low levels of disruptive behavior (Greenwood et al., 2002). As a result of the potential benefits associated with increasing task engagement, school personnel are particularly interested in methods that might help them to do so.

Fortunately, a variety of intervention strategies have been used to increase task engagement, including those incorporating choice-based interventions.

There is evidence to suggest that both antecedent- and consequent-based interventions incorporating choice are effective for improving behavior. Although both types of choice-related techniques have been supported by the research literature, the literature itself is limited. Few researchers have investigated the effects of choice-related strategies on task engagement exhibited by female children, young children, children without disabilities, children without severe or overt behavior problems, children in general education settings, or children working on academic tasks. In addition, no researchers have considered the differential effects of task-related choice-making for kids with performance versus skills deficits. Clearly, there is a need for these limitations to be addressed.

Research comparing the effectiveness of choice-making strategies could impact how off-task behavior is addressed in schools. If the research indicates that students attend to tasks longer in response to a particular treatment incorporating choice, for instance, school psychologists or behavior specialists may be more likely to recommend the intervention in the future. On the other hand, if the research indicates that students
attend to tasks for equal amounts of time despite the particular strategy in place, issues such as teacher preference and logistics may become more valuable when practitioners are recommending interventions. If the research indicates that students respond differently to particular choice-making strategies, the development of brief individual assessment of interventions incorporating choice may be warranted.

In a previous investigation, the primary researcher used an ATD to compare the differential effects of an antecedent-based choice strategy, a consequent-based choice strategy, and an escape extinction strategy on the disruptive behavior and task engagement exhibited by three preschool children with developmental delays (Burton, 2008). The antecedent-based strategy utilized allowed participants to select the order in which they would complete tasks. The consequent-based strategy utilized allowed participants to select a reward for displaying decreased levels of disruptive behavior. An escape extinction procedure served as a control, and it utilized a three-step prompting procedure to ensure that participants completed tasks. Differential effects were not observed across conditions; in fact, variable responding occurred for all participants across all conditions. Decreased levels of disruptive behavior and increased levels of task engagement were observed for all three participants.

Burton’s (2008) study was limited for several reasons. First, there were flaws associated with the preference assessment procedure. The participants may have had difficulty understanding picture symbols that were used to represent the escape and attention options during the assessment, for example. This flaw means that the most preferred reward options may not have been identified as a result of the preference assessment. Also, no interobserver agreement (IOA) or integrity data were collected
during the preference assessment. Another limitation was that the functional analysis attention condition was not reflective of the typical classroom environment. That is, disruptive behavior is not generally met with 30 s of contingent attention in the classroom. The students may have satiated quickly in the attention condition as a result of the extended amount of attention they received. If satiation did occur, the role of attention in disruptive behavior may have been underrepresented in the investigation. Another problem was that the number of experimental conditions conducted varied across days. In other words, procedures were not identical on a daily basis, and some days involved more sessions than others. The variation in the number of sessions may have produced data in which participants performed less favorably on days when more sessions were conducted as a result of fatigue. In addition, the possibility of carryover effects was great on days during which several conditions were conducted. The results were limited because the classroom teacher rated the acceptability of the treatment strategies differently across participants. This limitation means that no conclusions can be drawn related to the general acceptability of the treatment strategies. Finally, the external validity was also limited because all participants were males between three and five years of age, all displayed developmental delays, all attended the same public preschool program, and all exhibited behaviors that were hypothesized to be maintained by escape/avoidance.

The current investigation attempted to address many of the limitations of Burton (2008). Attempts were made to examine the effects of antecedent and consequent choice-related strategies for a more diverse group of students, for example. In addition, an alternative experimental design strategy was utilized, and escape extinction was excluded as a component of treatment. Older and/or higher functioning students may be
more likely to exhibit passive off-task behavior or have difficulties with motivation. Therefore, task engagement was examined as a primary dependent variable, and only students who demonstrated performance deficits in task engagement were included in the study. The primary purpose of the current investigation was to examine the effects of an antecedent intervention incorporating choice (task sequence selection) and a consequent intervention incorporating choice (preferred stimuli selection) on the task engagement exhibited by students with performance deficits.

Research Questions

The following research questions were evaluated in this investigation:

1. Do children with performance deficits have higher levels of task engagement when they are instructed to complete tasks in a specified order or when they are presented with the opportunity to select the order in which they complete tasks?

2. Do children with performance deficits have higher levels of task engagement when they are presented with the opportunity to select the order in which they complete tasks or when they are instructed to complete tasks in a specified order and are presented with the opportunity to select a reward for improved performance?

3. Do children with performance deficits have higher levels of task engagement when they are instructed to complete tasks in a specified order or when they are instructed to complete tasks in a specified order and presented with the opportunity to select a reward for improved performance?
CHAPTER II

METHOD

Participants and Setting

Two pairs of student-teacher dyads participated in the current investigation. The first pair included Camelia and her teacher and David and his teacher. Camelia was a Caucasian female who was six years, three months of age at the outset of the study. She was in the first grade. Camelia’s teacher was a Caucasian female with bachelor’s and master’s degrees in Early Childhood Education. She had 19 years of total teaching experience, with nine years in the first grade. David was a Caucasian male who was seven years, 11 months of age at the outset of the study. He was in the second grade. David’s teacher was a Caucasian female with bachelor’s and master’s degrees in Early Childhood Education. She had 25 years of total teaching experience, with four years in the second grade.

The second pair of student-teacher dyads included Joseph and his teacher and Cate and her teacher. Joseph was a Caucasian male who was six years, six months of age at the outset of the study. He was in the first grade. Joseph’s teacher was a Caucasian female with a bachelor’s degree in Elementary Education. She had five years of total teaching experience, with one year in the first grade. Cate was a Caucasian female who was six years, eight months of age at the outset of the study. She was in the first grade. Cate began taking Intuniv® near the end of the current study (data point 23). Intuniv®, or guanfacine extended release is classified as an antihypertensive and it is prescribed in the treatment of ADHD (“Guanfacine Extended Release,” 2012). In two studies, Intuniv® resulted in significant mean reductions in the signs and symptoms of ADHD when
compared to a placebo for individuals six to 17 years of age (‘New Formulation: Intuniv,’ 2009). It was presumed that Cate was diagnosed with the disorder during the course of the study; however, Cate’s parents made no reports to the teacher regarding a diagnosis of ADHD. Furthermore, the teacher did not inform the researcher that this medication was introduced until after the completion of the study. Cate’s teacher was a Caucasian female with bachelor’s and master’s degrees in Elementary Education. She had 19 years of total teaching experience, with 17 years in the first grade.

All participants attended the same public school in the rural southeastern United States, and all were referred by their classroom teachers for exhibiting low levels of task engagement. To be included in the study, each participant had to exhibit lower levels of task engagement than a teacher-nominated peer, and participants’ low task engagement had to be related to a performance deficit. It is important to note that the procedures utilized in the current investigation for the identification of performance deficits were not traditional. Traditional procedures as well as those that were used in the investigation are further detailed in the Procedure section of this document. Students had to have no known cognitive impairments (e.g., they did not receive special education services) and no major behavior problems (e.g., frequent aggression) in order to participate in the study. As a first step in the current project, the project was reviewed and approved by a University Human Subjects Protection Review Committee, which ensures that research projects involving human subjects follow federal regulations (see Appendix A; original approval was granted on February 16, 2009 and subsequent renewals were approved on February 1, 2010 and June 14, 2011). Next, school board approval was obtained (see Appendix B). Parent and teacher consent were also obtained prior to participants’
inclusion in the study (see Appendixes C and D). All phases of the current investigation took place in the students’ classrooms. The primary researcher, who acted as the consultant for all cases, and another trained observer collected data.

Materials

The primary researcher conducted the *Functional Assessment Informant Record for Teachers - Academic* (FAIR-TA; Henry, 2000) as a semi-structured interview with each referring teacher. The FAIR-TA was used to gain information from teachers about antecedent and consequent variables related to participants’ task engagement (see Appendix E). The data also assisted in forming objective definitions of participants’ task engagement. The FAIR-TA is made up of 30 questions, 20 of which include multiple choice options. The majority of interview questions are related to factors that may influence a student’s academic performance. The FAIR-TA has been demonstrated to be effective in discriminating between performance and skill deficits (Henry, 2000). A performance deficit was hypothesized if task engagement was affected by the presence of other people, being seated in a particular location in the classroom, receiving teacher and/or peer attention, having access to a preferred activity, receiving positive consequences such as free time, and/or receiving negative consequences such as staying in for recess. If low task engagement was not hypothesized to be a result of a performance deficit, the participant was excluded and served outside the study.

Task materials were used to assess participants’ task completion. Task materials included pencils and various math worksheet packets for all participants. Worksheet packets were compiled from a variety of sources, and each contained approximately 50 math problems. Some packets included graphics, whereas others did not. Camelia had
worksheet packets that contained vertically-aligned addition problems (1 digit by 1 digit), packets that contained horizontally-aligned addition problems (1 digit by 1 digit), and packets that contained vertically- and horizontally-aligned addition problems (1 digit by 1 digit). David had worksheet packets that contained vertically-aligned addition problems (2 digits by 2 digits, with regrouping) and packets that contained vertically-aligned subtraction problems (2 digits by 2 digits, without regrouping). Joseph had worksheet packets that contained vertically-aligned addition or subtraction problems (1 digit by 1 digit), packets that contained horizontally-aligned addition or subtraction problems (1 digit by 1 digit), and packets that contained both vertically- and horizontally-aligned addition or subtraction problems (1 digit by 1 digit). Cate had worksheet packets that contained vertically-aligned addition problems (1 digit by 1 digit) and packets that contained vertically-aligned subtraction problems (1 digit by 1 digit). Like the other students in her classroom, Camelia also had a number line affixed to her desk.

A modified edition of The Intervention Rating Profile 15 (IRP-15; Martens, Witt, Elliott, & Darveaux, 1985; see Appendix F) was used to assess the acceptability of each choice-related strategy. Research indicates that the modified edition of the IRP-15 utilized in the current investigation has no effect on the instruments’ psychometric properties (Freer & Watson, 1999). The IRP-15 is composed of 15 questions that the respondent rates on a Likert-type scale ranging from 6 (strongly agree) to 1 (strongly disagree). Ratings range from a total score of 15 - 90, where a total score above 52.5 represents a rating of acceptable (Von Brock & Elliott, 1987). The IRP-15 is a reliable instrument (Cronbach alpha = .98) and all factors load on a General Acceptability Factor (ranging from .82 - .95; Martens et al., 1985).
Procedure

Interview

The primary researcher first conducted the FAIR-TA (Henry, 2000) with each participant’s teacher. During the interview, the teacher was asked to identify at least two independent tasks that were associated with low levels of task engagement or work incompletion. The teacher was also asked to assist in defining task engagement as it pertained to the identified tasks. All interviews took place in the teachers’ classrooms at a time that was convenient for them. If data gathered in the interview suggested that the student’s low level of task engagement was the result of a skill deficit, the student was not included in the study. In addition, if data suggested the participant exhibited low task engagement or task incompletion on one task only, he or she was excluded as a participant. Four participants were screened out as a result of the interview, and all of these students received intervention services outside the context of the study.

The primary researcher and another rater independently reviewed data obtained in the FAIR-TA. The two reviews served in the development of hypotheses related to whether low task engagement was a result of performance deficits. In the case that the two raters agreed, the participant continued to the next phase of the study. If the two raters did not agree, a third rater reviewed the FAIR-TA in order to resolve the discrepancy. A third rater was not required during the hypothesis generation phase. Additionally, no participants were screened out of the study at this point in the investigation.
Classroom Observation

The primary researcher conducted two 10-min classroom observations of the participant and a same-gender peer (the peer was teacher-nominated) during tasks that were reported by the teacher to be problematic for the target student. The percentage of intervals with task engagement was assessed in each observation. If the target student displayed lower levels of task engagement than a teacher-nominated, same-gender peer, he or she was included in the study. If this criterion was not met, the student received services outside the study. As a result of the information gathered during the classroom observations, five participants were screened out and received other intervention services. Four students were ultimately included in the investigation: (a) Camelia ($M = 19\%$; range = 10\% - 23\%) had substantially lower levels of task engagement than her peer ($M = 86\%$; range = 69\% - 97\%); (b) David ($M = 48\%$; range 43\% - 53\%) had substantially lower levels of task engagement than his peer ($M = 98\%$; range = 96\% - 100\%); (c) Joseph ($M = 29\%$; range = 12\% - 47\%) had substantially lower levels of task engagement than his peer ($M = 96\%$; range = 92\% - 100\%); and (d) Cate ($M = 40\%$; range 33\% - 47\%) had substantially lower levels of task engagement than her peer ($M = 93\%$, range = 87\% - 100\%).

Preference Assessment

The primary researcher assisted each teacher in conducting a class-wide preference assessment to identify the target student’s potential reinforcers. First, the classroom teacher nominated up to 10 items and/or activities that the target student might work to obtain. Next, each student in the class indicated on a worksheet which three items that he or she would most like to receive for working hard on independent tasks.
Camelia, Joseph, and Cate circled pictures of preferred items, and David circled names of preferred items (see Appendix G). Recent research has indicated that student nomination may be an effective means of identifying potential reinforcers for students in general education settings (Schanding, 2004). Camelia and Cate indicated that they would like to work for candy, stickers, and erasers; David indicated that he would like to work for candy, stickers, and bookmarks; and Joseph indicated that he would like to work for candy, stickers, and reward certificates.

**Skill Versus Performance Deficit Analysis**

The primary researcher assisted the teacher in conducting a class-wide skill versus performance deficit analysis to determine if the target student’s low task engagement was a result of a skill deficit or a performance deficit. The target student’s percentage of intervals with task engagement was first assessed in a class-wide skill deficit condition and then assessed in a class-wide performance deficit condition. It is important to note that the use of percentage of intervals with task engagement as the dependent variable in a skill versus performance deficit analyses is non-traditional; that is, previous researchers (e.g., Duhon et al., 2004) have used dependent measures that are directly tied to task productivity (e.g., the number of items completed correctly per min). Therefore, this is the first study to date to attempt to rely on task engagement in the identification of skill and performance deficits. This matter is further addressed in the discussion section of this document. The skill versus performance deficit analysis was conventional in all other ways.

Prior to the skill deficit condition, the teacher instructed the entire class to complete a task that was previously identified as problematic for the target student. After
the students worked for five min, the teacher instructed the students to stop working and to turn in their tasks. During this time, the researcher calculated the target student’s percentage of intervals with task engagement. Prior to the performance deficit condition, the teacher instructed the entire class to complete the same type of task again. The teacher also informed the students that working harder would result in the opportunity to select a reward (one of the three rewards that the target student identified as preferred in the preference assessment). After the students worked for five min, the teacher instructed the students to stop working and to turn in their tasks. During this time, the researcher calculated the target student’s level of task engagement. If the target student’s task engagement improved substantially from the skill deficit condition to the performance deficit condition, the teacher allowed him or her to select a reward from the three that he or she indicated was preferred during the preference assessment. A percent increase of 25% in task engagement was considered to be a substantial improvement. Because the dependent variable in the current investigation was non-traditional, this particular percent increase was selected for two reasons: (a) first, it was used in previous research that relied on a traditional dependent variable (Daly, Witt, Martens, & Dool, 1997); and (b) because it appeared to represent an average criterion among researchers using traditional dependent variables. The classroom teacher was responsible for determining which other students were eligible for reward.

Camelia displayed task engagement during 70% of intervals in the skill deficit condition and during 97% of intervals in the performance deficit condition. Therefore, the analysis indicated a percent increase of 39% from the skill to the performance deficit condition. David displayed task engagement during 60% of intervals in the skill deficit condition.
condition and during 90% of intervals in the performance deficit condition. Therefore, the analysis indicated a percent increase of 50% from the skill to the performance deficit condition. Joseph displayed task engagement during 7% of intervals in the skill deficit condition and 93% of intervals in the performance deficit condition. Therefore, the analysis indicated a percent increase of 1,229% from the skill to the performance deficit condition. Cate displayed task engagement during 57% of intervals in the skill deficit condition and 90% of intervals in the performance deficit condition. Therefore, the analysis indicated a percent increase of 58% from the skill to the performance deficit condition.

Task Preference Assessment

The primary researcher assisted the teacher in conducting a class-wide task preference assessment to identify the target student’s relative preference (i.e., preferred, neutral, or non-preferred) for the independent tasks that the teacher identified as problematic. Specifically, the students were asked to indicate on a record sheet (see Appendix H) how he or she felt about the tasks. All tasks were explained to and demonstrated for the students by the classroom teachers. Student responses were recorded as *I like it*, *It’s okay*, or *I don’t like it*. All task preference assessments were conducted in the students’ general education classrooms. Camelia indicated that worksheets containing vertically-aligned addition, horizontally-aligned addition, and both vertically- and horizontally-aligned addition were all preferred. David indicated that worksheets containing addition were preferred, whereas worksheets containing subtraction were neutral. Joseph indicated that worksheets containing vertically-aligned addition or subtraction, horizontally-aligned addition or subtraction, and both
vertically- and horizontally-aligned addition or subtraction were preferred. Cate indicated that worksheets containing both addition and subtraction were preferred.

*Teacher Training*

The classroom teacher was trained to implement each condition prior to the implementation of that condition. That is, the primary investigator used traditional behavior skills training (BST; Miltenberger, 2004) procedures to ensure that the teacher could implement all conditions with integrity. First, the primary investigator verbally described the procedures of the condition to the teacher. The teacher was also provided with a handout summarizing the procedures (see Appendix I). Next, the primary investigator modeled correct implementation of the condition’s procedures for the teacher as the teacher played the role of the student. Finally, the teacher practiced the condition’s procedures with the primary investigator as the primary investigator played the role of the student. During this part of the training, the primary investigator also provided performance feedback to the teacher. The teacher was required to demonstrate 100% integrity before conducting the condition independently (see Appendixes J, K, and L). With the aid of a script, all teachers demonstrated 100% treatment integrity during training.

*Treatment Analysis*

The four participants were randomly assigned to one of two pairs of student/teacher dyads. The first pair of student/teacher dyads (Camelia and teacher, David and teacher) experienced conditions in a B/C/B + D/C format. That is, the participants were exposed to conditions in the following order: no choice of task sequence (Condition B; NC), choice of task sequence (Condition C; CTS), choice of
reward (Condition B + D; CR), and choice of task sequence (Condition C; CTS). Camelia began NC on September 13th and completed the second CTS condition on October 13th. David began NC on November 3rd and completed the second CTS condition on December 6th. Therefore, there were approximately 1.5 months between when Camelia began the study and when David began the study. The second pair of student/teacher dyads (Joseph and teacher, Cate and teacher) experienced conditions in a B/B + D/C/B + D format. Therefore, they were exposed to conditions in the following order: no choice of task sequence (Condition B; NC), choice of reward (Condition B + D; CR), choice of task sequence (Condition C; CTS), and choice of reward (Condition B + D; CR). Joseph began NC on September 15th and completed the second CR condition on November 1st. Cate began NC on November 4th and completed the second CR condition on December 8th. Therefore, there were approximately 1.5 months between when Joseph began the study and when Cate began the study.

In all conditions, students were required to complete two brief work packets per session. The sequence of task completion was random (determined via a drawing with replacement) during NC and CR conditions for all participants. During sessions, the percentage of intervals with task engagement was recorded. The primary researcher or another advanced-level graduate student collected task engagement data. At the end of each phase, student’s performance data were shared with the teacher, and she was asked to evaluate the acceptability of the treatment strategy using a modified version of the IRP-15 (Martens et al., 1985).

**No Choice of Task Sequence (NC).** In the NC condition, the teacher passed out a work packet and then issued the following task instructions to students:
You are going to do 2 work packets today. First, you are going to do this packet, (show packet1) and then you are going to do this one (show packet 2). On this packet, you will have about 5 min to do your best work. Remember that this is not a race to see who finishes first. I am interested to see who works very hard. Put your name at the top of your first packet. Do not begin working until I tell you to do so. Are you ready? Begin.

When five min passed, the teacher approached the students and removed the materials associated with the first task. She also passed out the second task and issued the following instructions to students:

   Now, you will have about 5 min to work on this packet (show packet 2).
   Remember that this is not a race to see who finishes first. You should try to work very hard. Put your name at the top of your second packet. Do not begin working until I tell you to do so. Are you ready? Begin.

When five min passed, the teacher approached the students and removed the materials associated with the second task. Then, the students resumed their routine activities. The researcher calculated the target student’s percentage of intervals with task engagement and recorded relevant permanent product data (i.e., percentage of items completed, percentage of items completed correctly). No consequence was provided to any student, regardless of the level of task engagement.

**Choice of Task Sequence (CTS).** In the CTS condition, the teacher passed out two work packets and then issued the following task instructions to students:

   You are going to do 2 work packets today. You are going to do this packet (show packet1) and this packet (show packet 2). I am going to pass out both packets
right now, but I want you select the one that you are going to do first. When you have selected the one that you want to do first, write the #1 at the top of that packet. Also, put the other packet inside your desk. You will have about 5 min to do your best work on the first packet. Remember that this is not a race to see who finishes first. I am interested to see who works very hard. Put your name at the top of your packet. Do not begin working until I tell you to do so. Are you ready? Begin.

When five min passed, the teacher approached the students and removed the materials associated with the first task. She also issued the following instructions to students:

Now, you are going to work on your second task. Please pull the packet out of your desk and write the #2 at the top of the packet. You will have about 5 min to work on your second task. Remember that this is not a race to see who finishes first. I am interested to see who works very hard. Put your name at the top of your packet. Do not begin working until I tell you to do so. Are you ready? Begin.

When five min passed, the teacher approached the students and removed the materials associated with the second task. Then, the students resumed their routine activities. The researcher calculated the target student’s level of task engagement and recorded relevant permanent product data (i.e., percentage of items completed, percentage of items completed correctly). No consequence was provided to any student, regardless of the level of task engagement. At the end of this phase, the teacher was asked to complete a modified version of the IRP-15 (Martens et al., 1985) so that the acceptability of the CTS condition could be assessed.
No Choice of Task Sequence + Choice of Reward (CR). In the CR condition, the teacher passed out the first work packet and then issued the following task instructions to students:

You are going to do 2 work packets today. First, you are going to do this packet, (show packet 1) and then you are going to do this one (show packet 2). On this task, you will have about 5 min to do your best work. Remember that this is not a race to see who finishes first. I am interested to see who works very hard. If you work very hard today, you will have the opportunity to select a reward. Put your name at the top of your packet. Do not begin working until I tell you to do so. Are you ready? Begin.

When five min passed, the teacher approached the students and removed the materials associated with the first task. She also passed out the second packet and issued the following instructions to students:

Now, you will have about 5 min to work on this packet (show packet 2). Remember that this is not a race to see who finishes first. You should try to work very hard. If you work very hard today, you will have the opportunity to select a reward. Put your name at the top of your packet. Do not begin working until I tell you to do so. Are you ready? Begin.

When five min passed, the teacher approached the students and removed the materials associated with the second task. Then, the students resumed their routine activities. The researcher calculated the target student’s level of task engagement and recorded relevant permanent product data (e.g., percentage of items completed, percentage of items completed correctly). The target student’s median level of task engagement during the
NC condition served as his or her reward criterion in the CR condition. If the target student met or exceeded his or her reward criterion, he or she was allowed to select one of the three rewards he or she identified as preferred in the preference assessment. If the student did not meet his or her reward criterion, no consequence was provided. The teacher was responsible for determining which other students were eligible for reward. At the end of this phase, the teacher was asked to complete the a modified version of the IRP-15 (Martens et al., 1985) so that the acceptability of the CR condition could be assessed.

Design, Data Analysis, and Dependent Variable

A nonconcurrent multiple baseline across two pairs of student-teacher dyads (Hayes, Barlow, & Nelson-Gray, 1999), with counterbalancing of conditions across dyads, was used to examine participants’ task engagement in NC, CTS, and CR conditions. This design strategy was selected because it allowed for the direct comparison of conditions. The first pair of student-teacher dyads (Camelia and teacher, David and teacher) experienced conditions in the following sequence: NC/CTS/CR/CTS. The second pair of student/teacher dyads (Joseph and teacher, Cate and teacher) experienced conditions in another sequence: NC/CR/CTS/CR. The design used in the current investigation provided some protection against extraneous variables and measurement error. Additionally, counterbalancing conditions across participant dyads allowed for greater control of order effects among conditions (Hayes, et al., 1999).

Phase changes occurred as a result of trend and stability of the students’ task engagement data. The data were analyzed using visual inspection and percentage of
non-overlapping data (PND; Scruggs, Mastropieri, & Casto, 1987). According to the guidelines put forth by Scruggs and Mastropieri (1998), interventions are classified as being very effective, effective, questionable, or ineffective. Very effective interventions are those with more than 90% of data points falling higher than the highest baseline data point. Effective interventions are those with 70% to 90% of data points falling higher than the highest baseline data point. Questionable interventions are those with 50% to 70% of data points falling higher than the highest baseline data point. Ineffective interventions are those with less than 50% of data points falling higher than the highest baseline data point.

The primary dependent variable was percentage of intervals with task engagement. In order for a student to be considered engaged with a task, he or she had to have eyes directed toward the task or had to be manipulating task materials in an intended manner. Percentage of task engagement was assessed in 10-min sessions using 10 s whole interval recording procedures. Changes in permanent product data were analyzed as secondary dependent variables. Specifically, the percentage of items completed (the number of items attempted divided by the number of total items and multiplied by 100) and the percentage of items completed correctly (the number of items completed correctly divided by the number of items attempted and multiplied by 100) were determined for each task.

Observer Training, Interobserver Agreement, and Integrity

All observers were required to achieve at least 90% IOA with the primary investigator across two sessions before conducting observations independently. IOA was calculated using the following formula: the number of agreements of behavioral
occurrence divided by the number of agreements plus disagreements of behavioral occurrence, and multiplied by 100. IOA was assessed across 31.39% of all sessions. Specifically, it was assessed across 29.11% of NC sessions, 29.68% of CTS sessions, and 35.38% of CR sessions. Table 1 lists the IOA percentages for each participant.

Table 1

*IOA and Integrity Data for Each Participant*

<table>
<thead>
<tr>
<th>Participant</th>
<th>Phase</th>
<th>Mean IOA</th>
<th>IOA Range</th>
<th>Mean Integrity</th>
</tr>
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<tbody>
<tr>
<td>1. Camelia</td>
<td>NC</td>
<td>95%</td>
<td>90% - 100%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>CTS</td>
<td>95%</td>
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<td>93%</td>
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<tr>
<td></td>
<td>CTS</td>
<td>100%</td>
<td></td>
<td>100%</td>
</tr>
<tr>
<td>2. David</td>
<td>NC</td>
<td>93%</td>
<td>90% - 97%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>CTS</td>
<td>90%</td>
<td>89% - 92%</td>
<td>100%</td>
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</tr>
<tr>
<td></td>
<td>CTS</td>
<td>92%</td>
<td>89% - 96%</td>
<td>100%</td>
</tr>
<tr>
<td>3. Joseph</td>
<td>NC</td>
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<td></td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>CR</td>
<td>94%</td>
<td>87% - 100%</td>
<td>100%</td>
</tr>
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</table>
Table 1 (continued).

<table>
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<tr>
<th>Participant</th>
<th>Phase</th>
<th>Mean IOA</th>
<th>IOA Range</th>
<th>Mean Integrity</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Joseph</td>
<td>CTS</td>
<td>97%</td>
<td>93% - 100%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>CR</td>
<td>90%</td>
<td>87% - 92%</td>
<td>100%</td>
</tr>
<tr>
<td>4. Cate</td>
<td>NC</td>
<td>95%</td>
<td>92% - 98%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>CR</td>
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<tr>
<td></td>
<td>CR</td>
<td>93%</td>
<td>88% - 98%</td>
<td>100%</td>
</tr>
</tbody>
</table>

* = One datum.

Interscorer agreement was also assessed across 30% of all participants’ permanent product data. That is, 30% of each participant’s worksheets were scored by an independent scorer. Interscorer agreement was calculated using the following formula: the number of agreements divided by the number of agreements plus disagreements, and multiplied by 100. Interscorer agreement averaged 96.77% (range = 68.42% - 100%) for Camelia’s completion and 95.94% (range = 83.33% - 100%) for her accuracy; 100% for David’s completion and 100% for his accuracy; 99.26% (range = 87.5% - 100%) for Joseph’s completion and 100% for his accuracy; 100% for Cate’s completion and 99.77% (range = 95.83% - 100%) for her accuracy.
The percentage of procedural integrity was assessed across 100% of sessions using the *Choice-Related Conditions Integrity Checklist* (CRCIC; Appendices J, K, and L). The CRCIC contains 16 steps for the NC condition, 18 steps for the CTS condition, and 14 steps for the CR condition. If the step was completed by the teacher, the *Yes* column beside that step was checked; if the teacher did not complete the step, the *No* column beside that step was checked. The total number of checks in the *Yes* column was then divided by the total possible number of checks in the *Yes* column, and the value was multiplied by 100. If at any point during the investigation the percentage of treatment integrity fell below 80%, the teacher was re-trained on the procedures of the relevant condition. Re-training was never necessary during the investigation. With the aid of a script, teachers’ integrity averaged 100% during sessions.

**Acceptability**

Over the course of the study, each classroom teacher became familiar with the two choice strategies utilized. Additionally, data were shared with the classroom teacher on a regular basis. At the end of each choice condition, the teacher was asked to evaluate the acceptability of the particular choice treatment strategy using a modified version of the IRP-15. All of the teachers rated both choice strategies as acceptable. However, Camelia’s teacher rated CTS (72) as slightly more acceptable than CR (70), whereas David’s teacher, Joseph’s teacher, and Cate’s teacher all rated CR (89, 84, and 75, respectively) as more acceptable than CTS (64, 82, and 68, respectively). When asked why she found CTS more acceptable than CR, Camelia’s teacher indicated that the strategy did not require having rewards on hand and it did not require as much class time as allowing each student to select a reward. She also indicated that using rewards
sometimes involves additional time spent managing student behavior (e.g., they may play with erasers during task time or fail to throw away candy wrappers). When David’s teacher, Joseph’s teacher, and Cate’s teacher were asked why they found CR more acceptable than CTS, they indicated that they did not feel that selecting task order was as strong a motivator for their students as was selecting a reward.
CHAPTER III
RESULTS

Treatment Analysis

Task Engagement

Camelia. Camelia’s task engagement data during the treatment conditions analysis are presented in the top panel of Figure 1. In NC, Camelia’s task engagement was variable, and a decreasing trend was established at the end of the phase ($M = 68.88\%$, range $= 60\% - 81.67\%$). When CTS was introduced, it produced an immediate increase in the level of task engagement ($M = 84.19\%$, range $= 71.67\% - 88.33\%$), and stability was established by the end of the phase. When CR was introduced, it produced another immediate, albeit smaller, increase in the level of task engagement ($M = 94.44\%$, range $= 93.33\% - 95\%$). Task engagement was high and stable throughout the phase. When CTS was re-introduced, an initial decrease in the level of task engagement was followed by the establishment of an increasing trend. Task engagement reached near 100% levels at the end of the phase ($M = 98.33\%$, range $= 88.33\% - 98.33\%$). When PND was evaluated, the first CTS condition (80% non-overlapping data with NC) was considered effective, the CR condition (100% non-overlapping data with NC) was considered very effective, and the second CTS condition (100% non-overlapping data with NC) was considered very effective for improving Camelia’s task engagement relative to NC.

David. David’s task engagement data during the treatment conditions analysis are presented in the bottom panel of Figure 1. In NC, David’s task engagement was highly variable across the phase ($M = 66.31\%$, range $= 25\% - 92.72\%$). An increasing trend
Figure 1. Percentage of intervals with task engagement for Camelia and David across No-Choice (NC), Choice of Task Sequence (CTS), and Choice of Reward (CR) conditions.
in task engagement was evidenced early in the phase and a high level of engagement was achieved. These phenomena did not endure, however, and a decreasing trend emerged at the end of the phase. When CTS was introduced, it produced an immediate slight decrease in the level of task engagement and data were variable throughout the phase ($M = 73.84\%$, range = $61.67\%$ - $87.27\%$). This variability resulted in a marked amount of overlap with NC data. When CR was introduced, it produced no immediate change in the level of task engagement ($M = 83.46\%$, range = $64.29\%$ - $98.28\%$) and variability persisted. A decreasing trend emerged near the middle of the phase and the level of task engagement fell below the reward criterion for 1 session. After failing to meet the reward criterion, David demonstrated an immediate and substantial increase in task engagement. Despite the fact that task engagement was high at the end of the CR phase, overlap with the previous phase was still remarkable. When CTS was re-introduced, it produced an immediate and striking decrease in the level of task engagement. The data were variable throughout the phase ($M = 72.83\%$, range = $59.18\%$ - $92.16\%$) and overlap with the previous phase was again prominent. When PND was evaluated, the first CTS condition (0% non-overlapping data with NC), the CR condition (22% non-overlapping data with NC), and the second CTS condition (0% non-overlapping data with NC) were all considered ineffective for improving David’s task engagement relative to NC.

*Joseph.* Joseph’s data for task engagement during the treatment conditions analysis are presented in the top panel of Figure 2. In NC, Joseph’s task engagement improved from the first data point to the next, but a decreasing trend quickly emerged thereafter ($M = 41.67\%$, range = $20\%$ - $61.67\%$). When CR was introduced, it produced
Figure 2. Percentage of intervals with task engagement for Joseph and Cate across No-Choice (NC), Choice of Reward (CR), and Choice of Task Sequence (CTS) conditions.
an immediate increase in the level of task engagement, and Joseph met the criterion to select a reward in all but two sessions. An increasing trend was evidenced across the phase, and Joseph’s level of task engagement was high and stable at the end of the phase ($M = 68.84\%$, range = 26.67\% - 100\%). When CTS was introduced, it produced an immediate decrease in Joseph’s level of task engagement ($M = 63.33\%$; range = 43.33\% - 100\%). Data were initially variable but an increasing trend emerged across the phase and high levels of task engagement were observed at the end of the phase. Because Joseph’s task engagement was extremely variable in the first CR and CTS phases, a fair amount of overlap in data occurred. When CR was re-introduced, it produced no immediate change in the level of task engagement ($M = 67.18\%$, range = 23.33\% - 100\%). A decreasing trend emerged and the level of task engagement fell below the reward criterion for one datum. After failing to meet the reward criterion, Joseph demonstrated a salient improvement in task engagement and it was very high by the end of the phase. As before, extreme variability resulted in a remarkable amount of overlap between data obtained during CTS and the second CR phase. When PND was evaluated, the CR condition (57\% non-overlapping data with NC) and the CTS conditions (50\% non-overlapping data with NC) were considered questionable, and the second CR condition (33\% non-overlapping data with NC) was considered ineffective for improving Joseph’s task engagement relative to NC.

*Cate.* Cate’s task engagement data during the treatment conditions analysis are presented in the bottom panel of Figure 2. In NC, Cate’s task engagement was variable and a decreasing trend emerged at the end of the phase ($M = 76.22\%$,
range = 60.00% - 86.67%). When CR was introduced, it produced an immediate increase in the level of task engagement ($M = 74.5\%$, range = 58.33% - 86.21%), but variability was present throughout the phase. This variability resulted in remarkable amount of overlap in task engagement in the NC and first CR phases. When CTS was introduced, it produced an immediate increase in the level of task engagement ($M = 59.47\%$, range = 36.21% - 90.38%) and an increasing trend emerged at the end of the phase; however, variability increased and produced substantial overlap between the first CTS phase and the CR phase. It is important to note that Cate’s teacher moved her from the front of the classroom to the back of the classroom during the CTS phase. The seat change may have contributed to the decline in Cate’s task engagement. Cate also began taking Intuniv® during the phase. The effects of the introduction and continuation of this medication are unclear. When CR was re-introduced, it produced an immediate increase in the level of task engagement ($M = 58.56\%$, range = 13.33% - 85%). This effect was short-lived, however, and variability increased yet again. As before, extreme variability resulted in considerable overlap in task engagement between the CTS and the second CR phases. Additionally, Cate did not meet the criterion for a reward for the remainder of the phase. When PND was evaluated, the first CR condition (0% non-overlapping data with NC), the CTS condition (11% non-overlapping data with NC), and the second CR condition were all considered ineffective for improving Cate’s task engagement relative to NC.

Task Completion and Accuracy

Camelia. Camelia’s data for task completion and accuracy during the treatment conditions analysis are presented in the top panel of Figure 3. In NC, Camelia’s task
Figure 3. Percentage of task completion and accuracy for Camelia and David across No-Choice (NC), Choice of Task Sequence (CTS), and Choice of Reward (CR) conditions.
completion was variable ($M = 66.99\%$, range = $43.75\% - 94.44\%$) and her accuracy followed a similar path of variability ($M = 86.92\%$, range = $69.05\% - 100\%$). When CTS was introduced, it produced no immediate change in the level of task completion ($M = 67.48\%$, range = $47.50\% - 78.16\%$) or accuracy ($M = 82.77\%$, range = $54.39\% - 100\%$). Both completion and accuracy were variable during the phase; however, an increasing trend in Camelia’s accuracy emerged, and it was very high by the end of CTS. When CR was implemented, it produced a slight decrease in the level of task completion ($M = 50.22\%$, range = $40.56\% - 62.69\%$) and the downward trend continued for the remainder of the phase. Task accuracy, however, was high and fairly stable ($M = 95\%$, range = $90.48\% - 98.63\%$) during the phase. When CTS was re-introduced, it produced immediate increases in the levels of task completion ($M = 59.15\%$, range = $55.97\% - 65.83\%$) and accuracy ($M = 93.65\%$, range = $80.88\% - 98.92\%$). Both variables remained fairly stable through the end of the phase. Camelia’s task completion data were variable across all phases of the investigation; therefore, a considerable amount of overlap in these data occurred.

David. David’s data for task completion and accuracy during the conditions analysis are presented in the bottom panel of Figure 3. In NC, David’s task completion was variable ($M = 52.7\%$, range = $19\% - 89\%$), but his level of accuracy remained high and stable ($M = 95.61\%$, range = $92\% - 100\%$). When CTS was introduced, it produced no immediate change in the level of task completion. These data were variable and an increasing trend emerged at the end of the phase ($M = 68.20\%$, range = $56\% - 78\%$). The level of accuracy remained high and stable ($M = 97.57\%$, range = $90\% - 100\%$).
range = 95.24% - 98.72%). When CR was introduced, it produced an immediate increase in the level of task completion ($M = 73.78\%$, range = 60% - 88%). These data were variable throughout the phase, while the level of accuracy remained high and stable ($M = 99.1\%$, range = 97.53% - 100%). When CTS was re-introduced, it produced an immediate decrease in the level of task completion ($M = 64.38\%$, range = 45% - 77%). These data were variable and a decreasing trend emerged at the end of the phase, whereas the level of accuracy remained high and stable ($M = 97.91\%$; range = 95.56% - 100%).

David’s task completion data were variable across all phases of the investigation; therefore, a considerable amount of overlap in these data occurred.

**Joseph.** Joseph’s data for task completion and accuracy during the conditions analysis are presented in the top panel of Figure 4. In NC, Joseph’s task completion was variable ($M = 52.27\%$, range = 28.71% - 70.69%), but his accuracy was high and fairly stable ($M = 97.38\%$, range = 91.49% - 100%). When CR was introduced, it produced an immediate decrease in the level of task completion ($M = 68.71\%$, range = 32.35% - 100%); however, these data reached a high level near the middle of the phase. The level of accuracy remained high and fairly stable throughout CR ($M = 97.88\%$, range = 94.95% - 100%). When CTS was introduced, it produced an immediate and substantial decrease in the level of task completion, but this variable later increased and was high at the end of the phase ($M = 57.30\%$, range = 26.11% - 100%). The level of accuracy was high and fairly stable throughout CTS ($M = 99.05\%$, range = 97.22% - 100%). When CR was re-introduced, it produced no immediate change in the level of task completion ($M = 68.14\%$, range = 33.01% - 100%). A decreasing
Figure 4. Percentage task completion and accuracy for Joseph and Cate across No-Choice (NC), Choice of Reward (CR), and Choice of Task Sequence (CTS) conditions.
trend in task completion emerged, was followed by variability, and was again high at the end of CR. The level of task accuracy remained high and fairly stable throughout CR ($M = 98.28\%$, range = 88.24% - 100%). Joseph’s task completion data were extremely variable across all phases of the investigation; therefore, a considerable amount of overlap in these data occurred.

**Cate.** Cate’s data for task completion and accuracy during the conditions analysis are presented in the bottom panel of Figure 4. In NC, Cate’s task completion was variable ($M = 84.29\%$, range = 54% - 100%), whereas the level of accuracy was fairly high ($M = 95.82\%$, range = 85.12% - 100%). Increasing trends emerged in both completion and accuracy at the end of the phase. When CR was introduced, it produced an immediate increase in the level of task completion but these data were variable throughout the phase ($M = 77.18\%$, range = 56% - 100%). The level of accuracy remained high and fairly stable throughout the phase ($M = 96.58\%$, range = 85.33% - 100%). When CTS was introduced, it produced an immediate increase in the level of task completion ($M = 53.15\%$, range = 22.92% - 100%). Again, however, these data were extremely variable throughout the phase, while the level of accuracy was high and fairly stable ($M = 87.51\%$, range = 42.86% - 100%). Cate’s teacher moved her from the front of the classroom to the back of the classroom during this phase. The data indicated that this move may have contributed to the decline in Cate’s level of task completion. Her level of task accuracy, however, appears to have been largely unaffected. Cate also began taking Intuniv® during this phase. This change did not appear to have a major or lasting impact on Cate’s levels of task completion or accuracy. When CR was re-introduced, it produced an immediate increase in the level of task completion ($M = 49.49\%$,}
range = 17% - 80.61%) and variability was present throughout the phase. The level of accuracy was high, although it did appear to become slightly more variable as the phase progressed ($M = 97.21\%, \text{ range } = 91.67\% - 100\%$). Cate’s task completion data were variable across all phases of the investigation; therefore, a considerable amount of overlap in these data occurred.
CHAPTER IV
DISCUSSION

Conclusions

General Conclusions

The primary purpose of the current investigation was to explore the effects of two different types of task-related choice strategies on task engagement exhibited by students with performance deficits in the general education classroom. In a no-choice condition (NC), participants were required to complete two tasks; they were not able to make any choices related to order of task completion and they were not able to select (or receive) a reward for improved performance. In one choice condition (CTS), participants selected the order in which they completed two tasks. In another choice condition (CR), students selected a reward for improved levels of task engagement after they completed the two tasks. Task completion and accuracy were also recorded as secondary dependent variables.

The first research question sought to determine whether children with performance deficits exhibited higher levels of task engagement when they completed tasks in a specified order (NC) or when they selected the order in which they completed tasks (CTS). CTS was superior to NC for Camelia. Therefore, CTS may also produce increased levels of task engagement for other students who exhibit performance deficits. Additional research regarding the effects of CTS on the task engagement of students who exhibit performance deficits is warranted.

The second research question sought to determine whether children with performance deficits exhibited higher levels of task engagement when they selected the
order in which they completed tasks (CTS) or when they completed tasks in a specified order but were allowed to select a reward for improved performance (CR). CR and CTS resulted in improved and fairly equivocal levels of task engagement for Camelia. Therefore, both CTS and CR may also produce improved and similar levels of task engagement for other students who exhibit performance deficits. If the two strategies are equivocal in producing increased task engagement, then teacher preference and fit with classroom ecology may be relevant factors for consideration by school psychologists when providing recommendations during consultation. Teachers who implement strategies that they select have been shown to demonstrate higher levels of treatment integrity (Anderson, 2011).

The third research question sought to determine whether children with performance deficits exhibited higher levels of task engagement when they completed tasks in a specified order (NC) or when they completed tasks in a specified order and selected a reward for improved performance (CR). CR was superior to NC for Joseph. Therefore, CR may also produce increased levels of task engagement for other students who exhibit performance deficits. Additional research regarding the effects of CR on the task engagement of students who exhibit performance deficits is warranted.

Some general conclusions related to the effects of the choice strategies on participants’ levels of task completion and task accuracy may also be drawn. For three of four participants (David, Joseph, and Cate), task completion trended along with task engagement. Therefore, students who were more engaged with their tasks appeared more likely to complete a greater number of tasks overall. Improvements in task engagement may also result in increased task completion for other students who exhibit performance
deficits. Task accuracy tended to be high across participants (even in NC conditions), and was largely unaffected by the implementation of the choice strategies. Therefore, ceiling effects may have been present. It is important to note that this is an expected finding because all participants exhibited performance deficits.

*Individual Conclusions*

Although some general, overall findings can be taken from the reported data, it is important to note that the obtained results were somewhat idiosyncratic across participants. Thus, some discussion of individual results is warranted. For Camelia, CTS and CR produced similarly high levels of task engagement as well as similarly high levels of task accuracy by the end of the study. Because Camelia’s levels of task engagement and task accuracy improved as the study progressed, the data may simply have trended upward in response to treatment until ceilings were reached. That is, either intervention may have improved Camelia’s task engagement and accuracy more than no intervention at all. However, Camelia’s task completion decreased across the course of the study, although the data did become more stable across time. The increase in Camelia’s task engagement combined with the decline in her task completion may indicate that Camelia spent more time actively working each problem as the study progressed. She may also have spent more time utilizing the number line that was affixed to her desk. Regardless, the decreasing trend in Camelia’s task completion should theoretically reverse itself as Camelia’s math skills become more fluent (Haring, Lovitt, Eaton, & Hansen, 1978).

For David, variability and overlap in task engagement and task completion data were present across all phases of the investigation. Therefore, it is impossible to draw conclusions related to the differential effects of the three conditions. One or more
extraneous variable(s) may have affected David’s performance. Anecdotally, for example, he appeared to daydream more frequently and for longer periods of time than his peers. Additionally, David’s task engagement and task completion improved soon after his level of task engagement fell below the reward criterion in CR. Therefore, the consequence associated with not meeting the reward criterion in CR (i.e., losing the opportunity to select a reward) may have become more salient to David after he experienced it. Task accuracy was consistently high and stable; thus, a ceiling effect likely occurred.

For Joseph, CR was superior to NC. And although CR produced slightly higher mean levels of task engagement than CTS, variability and overlap in Joseph’s task engagement and task completion occurred in both of these conditions. Therefore, it is impossible to draw conclusions related to the differential effects of the two choice conditions. One or more extraneous variable(s) may have affected his performance. Anecdotally, for example, Joseph appeared to present to school with a variety of appearances and moods. On some occasions he seemed sleepy, irritable, and his clothing was disheveled; on other days, however, Joseph was cheerful, neatly groomed, he had gel in his hair, and he wore cologne. Additionally, Joseph’s task engagement and task completion generally improved near the end of each treatment phase. Thus, Joseph may have become more accustomed to (and perhaps less distracted by) the procedures of each phase as it progressed. Also, Joseph’s task engagement and task completion improved soon after his level of task engagement fell below the reward criterion in CR. Therefore, the consequence associated with not meeting the reward criterion in CR (i.e., losing the opportunity to select a reward) may have become more salient to Joseph after he
Joseph’s task accuracy was consistently high and fairly stable. However, he regularly skipped around when completing his math packets and may have completed only the problems that were easiest for him. Therefore, Joseph’s accuracy scores may have been inflated. If not, it is possible that a ceiling effect occurred with Joseph’s task accuracy.

For Cate, task engagement was erratic and overlap was present in all conditions. Therefore, conclusions regarding the differential effects of the three conditions are impossible to make. It does seem clear that none of the conditions produced clinically significant results and none were socially valid for Cate. One or more extraneous variable(s) may have influenced Cate’s task-related behavior during the study. Her task engagement and task completion were negatively impacted, for example, when her assigned classroom seat was moved from the front of the room to the back of the room. That is, Cate seemed more distracted by the objects and individuals around her when she was seated at the back of the room. The effects of the introduction and continuation of the medication, Intuniv®, on Cate’s task engagement and task completion were also unclear. A commonly reported side effect of Intuniv®, when introduced, is sleepiness (Shire US Inc., 2011). Although sleepiness was not directly assessed or monitored in the current study, Intuniv® may have negatively impacted Cate’s task engagement. Cate’s task engagement may also have been affected if choice opportunities were not preferred or even disliked. That is, choice opportunities may have sometimes operated as establishing operations (EO) and strengthened the reinforcing value of engaging in off-task behavior. Similarly, the opportunity to select a reward in CR may have sometimes operated as a positive punisher and decreased the likelihood that Cate would exhibit high levels of task
engagement in the future. It is important to note that Cate’s task accuracy was generally high and stable. Therefore, a ceiling effect likely occurred regarding these data.

Limitations

*Limitations Related to Idiosyncratic Results*

The primary limitation in the current investigation was that the data obtained were idiosyncratic across participants. Although, it is impossible to identify the various causes of participant-specific results, some hypotheses should be considered. First, perhaps conditions in the investigation were simply too short. Had conditions been carried out for longer periods of time, that is, data may have eventually become more stable for at least some participants. If David’s conditions had been carried out a bit longer, for example, responding in those conditions may have stabilized and additional conclusions may have been made possible.

Next, the operational definition of the primary target behavior (task engagement) may have inadequately captured the desired behavior. It was possible for participants to be scored as engaged by simply having their eyes oriented to task materials. It is possible, therefore, that students were not always focused on math tasks (e.g., daydreaming). Future investigators should attempt to define task engagement in a manner that allows them to better discriminate between true task engagement and the outward appearance of task engagement.

Participants demonstrated a variety of reactions to completing work packets in the presence of peers. Because the presence of peers seemed to operate as an EO for some participants and as an AO for others, idiosyncratic data may have resulted. The presence of peers may sometimes have functioned as an EO for Joseph’s task engagement and task
completion, for example. He generally raced his peers in completing work packets, announced aloud when he finished work packets, and smiled as he reported the names of the students he had “beaten” on the work packets. The presence of peers may sometimes have functioned as an AO for Camelia’s task engagement, on the other hand. She frequently checked her pace against that of her surrounding peers and even cried on one occasion, stating that she was one of the few students in her seating area who failed to complete a work packet. Future investigators should consider examining students’ task engagement both in the presence and absence of peers. Assessing and controlling for motivating operations (MO) may also prove beneficial in future research.

Next, the amount of time between the establishment and implementation of reward criteria differed between the two pairs of student-teacher dyads. The first pair of student-teacher dyads experienced NC immediately followed by CTS, for example, whereas the second pair of dyads experienced NC immediately followed by CR. The temporal differences between the establishment and implementation of reward criteria may have contributed to variations in students’ levels of task engagement. Future investigators should consider holding constant the amount of time between the establishment and implementation of reward criteria.

There were several issues associated with the tasks utilized in the current investigation. Task-related limitations that may have produced idiosyncratic results are discussed here. First, the tasks examined were reported by classroom teachers to be mastered by all target students, for example; however, some participants may have performed these tasks more skillfully than others. Skill level differences across
participants may have contributed to variations in individuals’ task engagement. Future researchers should consider assessing and controlling for students’ initial skill levels (i.e., acquisition, fluency, generalization, adaptation; Haring et al., 1978). Next, participants completed different task types as well as different numbers of task types. The variation in task types and the number of task types may have been a factor in the occurrence of idiosyncratic outcomes. Camelia, for instance, completed packets with horizontally-aligned addition, packets with vertically-aligned addition, and packets with horizontally- and vertically-aligned addition; therefore, she completed three task types. Cate, on the other hand, completed packets with vertically-aligned addition and packets with vertically-aligned subtraction; therefore, she completed two task types. Future investigators should consider keeping constant task types as well as the number of task types. More general task-related limitations are discussed in the following section.

General Limitations

Although the current investigations’ idiosyncratic results were its primary limitation, several other limitations may have impacted findings and must be considered as well. One very important limitation was that two treatment components, rather than the ideal one, were simultaneously introduced in CR. Not only did students earn the opportunity to select a reward in CR, but they also received a reward in the phase. Choosing a reward and receiving a reward are two distinct intervention components that could theoretically impact behavior in different ways. Because these two strategies were combined in CR, it was impossible to discriminate whether levels of task engagement in the phase were a product of participants choosing or receiving rewards in the current investigation. Another fairly important limitation was that the antecedent and consequent
choices available to students appear to be qualitatively dissimilar. It seems intuitive, for instance, that students would rate a choice strategy involving the receipt of a tangible reward as more highly preferred than one involving the opportunity to select task sequence. Future investigators should consider some modifications to address the limitations described above. First, rewards should be provided to students for task engagement occurring at or above a set criterion in all phases of the investigation. This strategy requires that the preference of rewards be held constant across phases. Teachers should specify rewards in NC and CTS and students should select rewards in CR. Future researchers should also attempt to make antecedent and consequent choices more qualitatively analogous. Comparisons could be made between the selection of task order (antecedent) and the selection of where completed tasks are deposited (consequent), for example. Regardless, the use of this strategy requires that the general preference of choice strategies be assessed and held constant across choice phases.

Three limitations were related to reward criteria and rewards. First, the reward criteria utilized in CR may not have been valid. As discussed earlier, pairs of student/teacher dyads experienced temporal differences between the establishment and implementation of reward criteria. Reward criteria for the second pair of student-teacher dyads (Joseph and teacher, Cate and teacher) may have been more appropriate, simply because the establishment of reward criteria in NC was immediately followed by their implementation in CR. Next, participants may not have clearly understood reward criteria. In an attempt to protect the identity of the target student, all students were provided with a vague description of the behavior that would earn them the opportunity to select a reward (i.e., “If you work very hard today, you will have the opportunity to
select a reward.”). Anecdotally, most students appeared to have a good idea of what was expected of them during sessions (i.e., they rarely asked follow-up questions and most worked until they completed the work packets). The data also suggest that if reward criteria were not initially clear to participants, two of four (David and Joseph) comprehended behavioral expectations after the first time they failed to meet reward criteria. That is, their failures to meet reward criteria were immediately followed by substantial increases in task engagement. Another limitation to the current study was that the reward options utilized may not have been reinforcers for participants. Reward options were selected using a preference assessment, a tool that assists only in identifying potential reinforcers. Future investigators should consider: (a) minimizing the length of time between the establishment and implementation of reward criteria to increase the likelihood of validity; (b) introducing reminders regarding reward criteria or formally assessing for the understanding of reward criteria; and (c) conducting reinforcer assessments so that reward options are indeed reinforcers.

The tasks utilized in the current investigation were associated with four general limitations. First, the participants were not necessarily exposed to each of their task types an equivalent number of times during the study. Variation occurred because task order was determined by a random drawing in NC and CR phases, and by student selection in CTS phases. One participant (Camelia), for example, completed 10 packets with horizontally-aligned addition, 17 packets with vertically-aligned addition, and 11 packets with both horizontally- and vertically-aligned addition during the study. Next, work packets were collected from a variety of sources and as a result, some inherent differences were likely present. Works packets may have varied slightly in their
difficulty, for example, and some contained graphics. Another limitation was that the number of problems contained in work packets was determined via teacher recommendation. However, anecdotal observation suggested that this number (i.e., approximately 50 problems) was reasonable for first- and second-graders to complete within the allotted time period (five min). That is, most students completed all problems well within the allotted time frame. Future investigators should consider: (a) using a semi-random method to determine task order; (b) standardizing worksheet difficulty and appearance; and (c) conducting pre-tests to determine more accurate average completion percentages for given groups of students. Finally, all of the tasks examined in the current investigation involved addition and/or subtraction. The results of this study, therefore, may only be generalized to situations in which addition and/or subtraction is used. Future investigators should examine a variety of tasks when exploring the effects of choice intervention strategies on participants’ task engagement.

Two limitations were related to data collection. First, a whole-interval recording procedure was used to document task engagement data. Whole-interval recording procedures likely underestimated participants’ percentage of intervals with task engagement (Cooper et al., 2007). That is, participants were required to be engaged in a task for a full 10 s in order to be scored as on-task for a particular interval. Additionally, no follow-up or maintenance data were collected as a part of the current investigation. Follow-up or maintenance data would certainly have provided valuable information in the current investigation. Future investigators should consider using momentary time sampling with 30s or one-min intervals in their examinations of choice strategies on
participants’ task engagement. The researchers should also collect some form of follow-up or maintenance data, when feasible.

Three limitations were related to the use of PND as a method for determining the general effectiveness of the intervention strategies examined in the current investigation (Parker, Hagan-Burke, & Vannest, 2007). PND, for example, relies on only the highest baseline data point as a representation of an individual’s pre-treatment performance; therefore, an unreliable depiction of performance may occur. Although Joseph’s mean level of task engagement in NC was less than 42%, for example, PND would not consider an intervention strategy to be effective unless 70% - 90% of the data points obtained in response to that strategy were higher than 62% (Joseph’s highest level of task engagement in NC). Another problem with the use of PND is that it underestimates the effectiveness of an intervention strategy if a student performs well in both pre-treatment and treatment phases of an investigation (i.e., if ceiling effects are present). For example, Camelia’s high level of task engagement during NC left a relatively small window for non-overlapping data in later phases. Additionally, PND is unable to take into account trends that may be present in the data; therefore, reliance on this metric alone can result in an incomplete picture of pre-treatment performance and/or of an intervention’s effects. Cate’s highest level of task engagement during NC was almost 87%, for example, but a decreasing trend—which would have theoretically continued had a choice strategy not been implemented—occurred at the end of the phase. According to the interpretive guidelines of PND, both CTS and CR were considered ineffective interventions for David. However, increasing trends were present at the end of the first CTS phase as well as at the end of the CR phase. Clearly, there is some caution that must be utilized when
using PND. Future researchers should utilize multiple methods of analysis to ensure that they develop a comprehensive understanding of an intervention’s effects.

Three limitations were related to some of the assessment procedures utilized in the current investigation. First, the preference and task preference assessments were conducted only once during the study. Repeated measurements may have increased the validity of assessment results because a score derived from multiple probes is more likely to be accurate than one derived from only one probe. It may also have been beneficial to know whether participants’ preferences regarding rewards and tasks changed during the course of the study. Another limitation was that the percentage of intervals with task engagement was used as the dependent measure in the skill-performance deficit analysis, rather than a conventional direct measure of task productivity (Duhon et al., 2004). As a result, conclusions must be limited to students’ appearance of task performance rather than task performance itself. Finally, neither IOA nor procedural integrity data were recorded in preference assessments, task preference assessments, or skill-performance deficit analyses. IOA and integrity information would certainly have been valuable in the current study. In addition, IOA of integrity would have been helpful. Future researchers should consider: (a) conducting preference and task preference assessments multiple times during an investigation; (b) conducting additional research related to the non-traditional use of the skills/performance deficit analysis; (c) collecting IOA and procedural integrity whenever it is feasible to do so; and (d) collecting IOA of integrity.

Finally, some limitations were related to participant homogeneity. All of the students were in the first or second grade and all of the teachers were Caucasian females. Therefore, generalizations must be restricted to populations of these same groups. Future
investigators should attempt to obtain participants of varying ages and abilities in order to
determine how they might respond to task-related choice-making opportunities. It is also
important to consider that the participants’ ages may have meant that particular
disabilities (e.g., ADHD) were present but not yet diagnosed.

Summary and Future Directions

There is evidence to suggest that both antecedent (Bambara, Ager, et al., 1994; Bambara, Koger, Katzer, & Davenport, 1995; Cole et al., 1997; Dunlap et al., 1994; Kern et al., 2002; Kern, Mantegna, et al., 2001; Powell & Nelson, 1997; Romaniuk et al., 2002; Seybert et al., 1996) and consequent (Fisher et al., 1997; Golonka et al., 2000; Lerman et al., 1997; Tiger et al., 2006) interventions incorporating choice are effective for
increasing desirable behavior and decreasing undesirable behavior. The current study was
one of the first to compare the efficacy of an antecedent strategy incorporating choice and
a consequent strategy incorporating choice. Knowing which of these strategies, if either,
produces improvements in students’ task-related behavior may assist teachers,
psychologists, and other education service-providers in the selection and implementation
of interventions for with students who exhibit performance deficits. As a result of the
current investigation, neither CTS nor CR appear superior at improving participants’ task
engagement. However, several limitations were present in the study and, therefore,
additional comparative research is warranted.

This investigation was one of very few to examine several specific phenomena.
The effects of choice-making on the behavior of school-age children with performance
deficits who do not have significant cognitive or behavior impairments have rarely been
studied, for example. Research related to populations of typical cognitive and behavioral
development is extremely important because it applies to the majority of students who attend public schools. Additionally, student performance on academic tasks has not often been examined in studies related to the effects of choice opportunities. Because the majority of a student’s time at school is most likely dedicated to academic tasks (and because it is the area where researchers and educators hope to help students make the greatest gains), it makes sense to examine the effects of choice-making during such tasks. Third, the effects of a teacher-led assessment and intervention process have not been examined often in the literature. Research in this area is essential, given the ever-expanding assessment and intervention responsibilities of classroom teachers.

Because this study was one of the first of its kind, additional work should be conducted to determine whether similar results will be obtained. Future studies, for instance, could utilize more diverse tasks, investigate the effects of combinations of antecedent and consequent strategies, and/or examine the impact on various populations. One or any of these changes could produce results that differ from those found in this investigation. If similar results are found in future studies, it may indicate that additional effort should be expended in regard to determining the types of students who respond to various choice-making strategies. If specific kinds of students are found to respond more favorably to particular treatments, this information can be incorporated into the stockpile of behavioral problem-solving strategies that practitioners and teachers frequently utilize.
APPENDIX A

INSTITUTIONAL REVIEW BOARD APPROVAL LETTER

THE UNIVERSITY OF SOUTHERN MISSISSIPPI

Institutional Review Board
118 College Drive #5147
Hattiesburg, MS 39406-0001
Tel: 601.266.6820
Fax: 601.266.5509
www.usm.edu/irb

HUMAN SUBJECTS PROTECTION REVIEW COMMITTEE
NOTICE OF COMMITTEE ACTION

The project has been reviewed by The University of Southern Mississippi Human Subjects Protection Review Committee in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services (45 CFR Part 46), and university guidelines to ensure adherence to the following criteria:

- The risks to subjects are minimized.
- The risks to subjects are reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered regarding risks to subjects must be reported immediately, but not later than 10 days following the event. This should be reported to the IRB Office via the “Adverse Effect Report Form”.
- If approved, the maximum period of approval is limited to twelve months.
Projects that exceed this period must submit an application for renewal or continuation.

PROTOCOL NUMBER: 28112001
PROJECT TITLE: The Effects of Choice of Task Sequence and Reward on Task Engagement
PROPOSED PROJECT DATES: 11/15/08 to 11/15/09
PROJECT TYPE: Dissertation or Thesis
PRINCIPAL INVESTIGATORS: Britney N. Burton
COLLEGE/DIVISION: College of Education & Psychology
DEPARTMENT: Psychology
FUNDING AGENCY: N/A
HSPRC COMMITTEE ACTION: Expedited Review Approval
PERIOD OF APPROVAL: 01/13/2009 to 01/12/2010

Lawrence A. Hosman, Ph.D.
HSPRC Chair

Date
2-16-09
APPENDIX B

SCHOOL BOARD APPROVAL LETTER

April 20, 2011

Ms. Britney Burton

RE: Research Project: The Effects of Choice versus No-Choice of Task Sequence on Task Engagement

Dear Ms. Burton:

This is to notify you that at its meeting of April 14, 2011, the Board of Education approved your request to conduct the research project as described above in the School System. We look forward to working with you and please do not hesitate to call if you need assistance.

Superintendent
APPENDIX C

PARENT CONSENT FORM

Dear Parent,

I am a doctoral student in the School Psychology Program at The University of Southern Mississippi working under the guidance of Dr. Heather Sterling. As part of my doctoral dissertation project, I am examining the effectiveness of some interventions intended to increase the task engagement of children. Because your child’s teacher recently referred him/her for exhibiting difficulties completing tasks at school, he/she may be a good fit for the research project. Therefore, we hope you will consent for your child’s participation in the study.

We are interested in determining if providing children with some opportunities to make choices during tasks will improve their behavior. Specifically, we are looking to examine (a) an intervention that allows children to select the order in which they complete tasks and (b) an intervention that allows children to earn a reward for completing their tasks.

If you agree for your child to participate in this study, several steps will be completed during the course of the intervention:

1. First, your child’s teacher will be interviewed to get more information about the tasks that your child has difficulties with.
2. Next, your child’s teacher will be assisted in identifying some rewards that your child and the other students in the class might like to earn. Your child’s teacher will also be assisted in determining whether your child’s task engagement/incompletion difficulties are related to a skill or a performance deficit. Finally, the teacher will also be assisted in identifying how your child feels about the tasks he/she must complete.
3. Finally, trained observers will discreetly assess your child across three conditions as he/she works in class. In all of the conditions, your child’s teacher will instruct the students in your child’s class to complete two brief tasks. In one condition, all students will complete tasks in the order that the teacher selects. In another condition, each student will complete tasks in the order that he/she selects. In a third condition, the students will complete tasks in the order that the teacher selects and they will have the opportunity to earn rewards for improved performance. While all children in the classroom will be taking part in the tasks, only those children chosen for the study will be observed discreetly for purposes of the research.

This study may result in two benefits for your child and his or her teacher: (a) your child may increase his or her appropriate behavior during task time at school and (b) your child’s teacher may learn new skills that can be used with your child as well as subsequent students.
All interviews, observations, and other information obtained during this study will be kept strictly confidential. **We also request that you not reveal to your child that he/she has been referred for this study.** The teachers’ names, students' names, and other identifying information will not be disclosed to any person not connected with the study. This information will also be excluded from the dissertation project and any subsequent papers submitted to conferences or professional journals for publication. Your child’s participation in this study is entirely voluntary. In addition, you may withdraw from this study at any time without penalty, prejudice, or loss of benefits. Further services, if needed, may be provided outside this study.

Whereas no assurance can be made concerning results that may be obtained (as results from investigational studies cannot be predicted) the researcher will take every precaution consistent with the best scientific practice.

If you agree to participate, please read, sign, and return the following page. Please keep this letter for your records. If you have any questions about this study, please contact Britney Burton at (205) 388-0226 or Dr. Heather Sterling at (601) 266-5255. This project and this consent form have been reviewed by the Human Subjects Protection Review Committee, which ensures that research projects involving human subjects follow federal regulations. Any questions or concerns about rights as a research participant should be directed to the Institutional Review Board Office, The University of Southern Mississippi, Box 5147, Hattiesburg, MS 39406-5147, (601) 266-6820.

Sincerely,

_________________________
Britney Burton, M.A., B.C.B.A.
Psychologist-in-Training

_________________________
Heather E. Sterling, Ph.D.
Licensed Psychologist
MS License #: 41-004
THIS SECTION TO BE COMPLETED BY PARENT

Please Read and Sign the Following:

I have read the above documentation and consent to participate in this project. I have had the purpose and procedures of this study explained to me and have had the opportunity to ask questions. I am voluntarily signing this form to participate under the conditions stated. I have also received a copy of this consent. I understand that my child will participate in tasks daily and observations will be conducted on his/her behavior. I further understand that all data collected in this study will be confidential and that my child’s name and the teacher’s name will not be associated with any data collected. I understand that I may withdraw my consent for participation at any time without penalty, prejudice, or loss of privilege.

___________________________                        ________________________
Signature of Parent                        Date

___________________________
Signature of Witness
Dear Teacher,

I am a doctoral student in the School Psychology Program at The University of Southern Mississippi working under the guidance of Dr. Heather Sterling. As part of my doctoral dissertation project, I am examining the effectiveness of some interventions intended to increase the task engagement of students. Because you recently referred your student for exhibiting difficulties completing tasks at school, he/she may be a good fit for the research project. Therefore, we hope you will consent for your student’s participation in the study.

We are interested in determining if providing students with some opportunities to make choices during tasks will improve their behavior. Specifically, we are looking to examine (a) an intervention that allows students to select the order in which they complete tasks and (b) an intervention that allows students to earn a reward for completing their tasks.

If you agree for your student to participate in this study, several steps will be completed during the course of the intervention:

1. First, you will be interviewed to get more information about the tasks that your student has difficulties with.
2. Next, you will be assisted in identifying some rewards that your student and the other students in the class might like to earn. You will also be assisted in determining whether your student’s task engagement/incompletion difficulties are related to a skill or a performance deficit. Finally, you will be assisted in identifying how your student feels about the tasks he/she must complete.
3. Finally, trained observers will discreetly assess your student across three conditions as he/she works in class. In all of the conditions, you will instruct the students in your class to complete two brief tasks. In one condition, all students will complete tasks in the order that you select. In another condition, each student will complete tasks in the order that he/she selects. In a third condition, the students will complete tasks in the order that you select and they will have the opportunity to earn rewards for improved performance. While all students in the classroom will be taking part in the tasks, only those students chosen for the study will be observed discreetly for purposes of the research.

This study may result in two benefits for your student and you: (a) your student may increase his or her appropriate behavior during task time at school and (b) you may learn new skills that can be used with your student as well as subsequent students.

All interviews, observations, and other information obtained during this study will be kept strictly confidential. We also request that you not reveal to your student that he/she has been referred for this study. The teachers’ names, students’ names, and other
identifying information will not be disclosed to any person not connected with the study. This information will also be excluded from the dissertation project and any subsequent papers submitted to conferences or professional journals for publication. Your student’s participation in this study is entirely voluntary. In addition, you may withdraw from this study at any time without penalty, prejudice, or loss of benefits. Further services, if needed, may be provided outside this study.

Whereas no assurance can be made concerning results that may be obtained (as results from investigational studies cannot be predicted) the researcher will take every precaution consistent with the best scientific practice.

If you agree to participate, please read, sign, and return the following page. Please keep this letter for your records. If you have any questions about this study, please contact Britney Burton at (205) 388-0226 or Dr. Heather Sterling at (601) 266-5255. This project and this consent form have been reviewed by the Human Subjects Protection Review Committee, which ensures that research projects involving human subjects follow federal regulations. Any questions or concerns about rights as a research participant should be directed to the Institutional Review Board Office, The University of Southern Mississippi, Box 5147, Hattiesburg, MS 39406-5147, (601) 266-6820.

Sincerely,

_________________________
Britney Burton, M.A., B.C.B.A.
Psychologist-in-Training

_________________________
Heather E. Sterling, Ph.D.
Licensed Psychologist
MS License #: 41-004
THIS SECTION TO BE COMPLETED BY TEACHER

Please Read and Sign the Following:

I have read the above documentation and consent to participate in this project. I have had the purpose and procedures of this study explained to me and have had the opportunity to ask questions. I am voluntarily signing this form to participate under the conditions stated. I have also received a copy of this consent. I understand that my student will participate in tasks daily and observations will be conducted on his/her behavior. I further understand that all data collected in this study will be confidential and that my student’s name and the teacher’s name will not be associated with any data collected. I understand that I may withdraw my consent for participation at any time without penalty, prejudice, or loss of privilege.

__________________________________________  _______________________
Signature of Teacher                        Date

__________________________________________
Signature of Witness
APPENDIX E

FUNCTIONAL ASSESSMENT INFORMANT RECORD FOR TEACHERS - ACADEMIC (FAIR-TA)

Student: _______________________ Respondent: ________________________________

School: ___________________________ Age: ____ Sex: M F Date: ______

Briefly list below the student’s typical daily schedule of activities.

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Time</th>
<th>Activity</th>
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</table>

1. When during the day (activities and times) is the student:
   a. *Most likely* to complete assigned work successfully? ______________________
   b. *Least likely* to complete assigned work successfully? ______________________

2. Describe the referred student. What is he/she like in the classroom?
   _______________________________________________________________________
   _______________________________________________________________________
   _______________________________________________________________________

3. Pick a second student of the same sex who is also difficult to teach. What makes the referred student more difficult than the second student?
   _______________________________________________________________________

4. a. On what grade level is the student reading? _____________
   b. On what grade level is the average student in the class reading? _____________

5. a. On what grade level is the student performing in math? _____________
   b. On what grade level is the average student in class performing in math? _____________

6. Has there been a noticeable change in the student’s performance since the beginning of the school year? ___ yes ___ no
7. Do you have concerns that any of the following factors may be affecting the student's academic performance?

   a. Medications __ yes __ no
   b. Health problems __ yes __ no
   c. Past or present irregular attendance __ yes __ no
   d. Other environmental concerns __ yes __ no

If yes, to any of above, please describe:
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

8. What strategies have you tried in the past to teach this student? How effective were each of these strategies?
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

9. Please describe the student’s specific academic difficulty. Do not use a general description such as “reading comprehension” but give the actual behavior such as “responds inaccurately to comprehension questions presented orally after student silently reads a passage” or “is unable to retell a story previously listened to or read aloud.” If the student has difficulty in more than one academic area, (e. g., reading and math) another form will be given to you.
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

10. Is the student less likely to complete work successfully during:
   a. A certain type of task __ yes __ no
   b. Tasks that are easy for him/her __ yes __ no
   c. Tasks that are difficult for him/her __ yes __ no
   d. Certain subject areas __ yes __ no
   e. New subject material __ yes __ no

11. Is the student less likely to complete work successfully after:
   a. A request is made to stop a preferred activity __ yes __ no
   b. A request is made to begin a new activity __ yes __ no
   c. A request by the student has been denied __ yes __ no

12. Is the student less likely to complete work successfully when:
   a. A specific person is present in the room __ yes __ no
   b. A specific person is absent from the room __ yes __ no
   c. Seated in a certain location in the room __ yes __ no
   d. Not given a choice of activities __ yes __ no
13. Is the student less likely to complete work successfully when involved in:
   a. Large group work ___ yes ___ no
   b. Small group work ___ yes ___ no
   c. Independent work ___ yes ___ no
   d. One-to-one interaction ___ yes ___ no

14. Are there any events occurring in the child’s home that seem to precede the student’s academic performance difficulties at school? ___ yes ___ no

15. When the student leaves a task uncompleted or completes a task but with unacceptable accuracy, which of the following consequences most often occurs?
   a. Child engages in a preferred activity __
   b. Task is terminated (e.g., workbook is removed from child) __
   c. Child seeks and/or receives attention from peers __
   d. Child receives praise for efforts __
   e. Child is ignored __
   f. Child is re-directed to task __
   g. Child is reprimanded or interrupted from off-task behaviors __
   h. Child is required to stay in from recess __
   i. Other: ________________________________ __

16. As a result of the student’s academic difficulties are there any tasks that you have:
   a. Stopped presenting ___ yes ___ no
   b. Modified for this student only ___ yes ___ no

17. Is there anything you could do that would ensure that the student could successfully complete a task? ___ yes ___ no If yes, please explain:
   ____________________________________________________________________

18. Are there other problem behaviors that often occur after the student has been unsuccessful at a task? ___ yes ___ no If yes, describe:
   ____________________________________________________________________
   ____________________________________________________________________
   ____________________________________________________________________

19. How often does the student typically receive praise or any other positive consequence for improvement in academic performance?
   every time ___ ¾ of the time ___ ½ of the time ___ ¼ of the time ___ never ___

20. How much improvement in academic performance is necessary before the student receives praise?
   100 – 80% ___ 70 - 50% ___ 40-20% ___ 0-20% ___
21. How much time does the student typically spend actively engaged in the area of difficulty per school day? 

22. Are there opportunities for the student to receive assistance with tasks from:
   a. Teacher 
   b. Aide 
   c. Peers 
   d. Parents 
   e. Tutors 
   f. Other: __________________________

23. Does the student make use of the above opportunities? __ yes __ no

24. Would you say there is a good or sufficient match between the assignments/tests and:
   a. Textbook __ yes __ no
   b. Workbook __ yes __ no
   c. Lectures __ yes __ no
   d. Other teaching/learning activities __ yes __ no

25. Does the student:
   a. Make a large number of errors on assigned tasks? __ yes __ no
   b. Complete the assigned tasks? __ yes __ no

26. Do the errors appear to reflect:
   a. Carelessness? __ yes __ no
   b. Misunderstanding of the directions? __ yes __ no
   c. Failure to master necessary skills? __ yes __ no

27. Is the student less likely to complete work successfully when instructions are presented:
   a. Orally __ yes __ no
   b. Written __ yes __ no
   c. Through games __ yes __ no
   d. Through the computer __ yes __ no
   e. Through hands-on activities __ yes __ no
   f. Other: ____________________________ __ yes __ no

28. Is the student less likely to complete work successfully when the required response is:
   a. Oral __ yes __ no
   b. Written __ yes __ no
   c. Product (completion of project) __ yes __ no
   d. Other: ____________________________ __ yes __ no

29. How many months has this academic difficulty been present? <1 2 3 4 5-9
30. Please list any other information you believe will be useful in assessing the student’s academic difficulties.
The purpose of the questionnaire is to obtain information regarding the assessment and intervention selection procedure for your student. Please circle the number that best describes your agreement or disagreement with each statement.

1. This was an acceptable intervention for my student’s problem behavior.
   1 2 3 4 5 6

2. Most teachers would find this intervention appropriate for behavior problems in their classroom.
   1 2 3 4 5 6

3. This intervention was effective in changing my student’s problem behavior.
   1 2 3 4 5 6

4. I would suggest the use of this intervention to other teachers.
   1 2 3 4 5 6

5. My student’s behavior problem was disruptive enough to warrant use of this intervention.
   1 2 3 4 5 6

6. Teachers would find this intervention suitable for the behavior problems that their student has exhibited in the past.
   1 2 3 4 5 6

7. I would be willing to continue the use of this intervention in the classroom setting.
   1 2 3 4 5 6

8. This intervention did not result in negative side-effects for my student.
   1 2 3 4 5 6

9. This intervention would be appropriate for a variety of children.
   1 2 3 4 5 6

10. This intervention was consistent with those I have used in the classroom setting.
    1 2 3 4 5 6

11. The intervention was fair way to handle
100

my student’s problem behavior. 1 2 3 4 5 6

12. This intervention is reasonable for the problem behaviors that my student has exhibited. 1 2 3 4 5 6

13. I liked the procedures used in this intervention. 1 2 3 4 5 6

14. This intervention was good way to handle my student’s behavior problems. 1 2 3 4 5 6

15. Overall, this intervention was beneficial for my student. 1 2 3 4 5 6

Adapted from:
APPENDIX G

PREFERENCE ASSESSMENT SAMPLE
APPENDIX H

TASK PREFERENCE ASSESSMENT

1. How do you feel about ___________________________________________?
   (Insert Independent Task 1)
   I like it.  
   It’s okay.  
   I don’t like it.

2. How do you feel about ___________________________________________?
   (Insert Independent Task 2)
   I like it.  
   It’s okay.  
   I don’t like it.
APPENDIX I

TEACHER TRAINING HANDOUT

No Choice of Task Sequence (NC) Condition

1. First, deliver any necessary task-specific instructions to the students.

2. Then, deliver these instructions to the students: “You are going to do 2 work packets today. First, you are going to do this packet, [show packet1] and then you are going to do this one [show packet 2]. On this packet, you will have about 5 min to do your best work. Remember that this is not a race to see who finishes first. I am interested to see who works very hard.”


4. Instruct the students: “Put your name at the top of your first packet. Do not begin working until I tell you to do so.”

5. Look around the room to see that all students have put their names on their packets. Then, say: “Are you ready? Begin.”

6. When 5 min have passed, approach the students.

7. Instruct the students to stop the first packet and hand in their work. “Stop working now. It is okay if you have not finished. Hold your packets up and I will come and get them.”

8. Collect the students’ packets.

9. Instruct the students: “Now, you will have about 5 min to work on this packet [show packet 2]. Remember that this is not a race to see who finishes first. You should try to work very hard.”

11. Instruct the students: “Put your name at the top of your packet. Do not begin working until I tell you to do so.”

12. Look around the room to see that all students have put their names at the tops of their packets. Then, say: “Are you ready? Begin.”

13. When 5 min have passed, approach the students.

14. Instruct the students to stop the second packet and hand in their work. “Stop working now. It is okay if you have not finished. Hold your packets up and I will come and get them.”

15. Collect the students’ packets.

16. Do not provide a consequence to any student, regardless of task engagement.

Choice of Task Sequence (CS) Condition

1. First, deliver any necessary task-specific instructions to the students.

2. Then, deliver these instructions to the students: “You are going to do 2 work packets today. You are going to do this packet [show packet 1] and this packet [show packet 2]. I am going to pass out both packets right now, but I want you select the one that you are going to do first. When you have selected the one that you want to do first, write the #1 at the top of that packet. Also, put the other packet inside your desk.”


4. Look around to see that everyone has one packet on their desks. Then instruct the students: “You will have about 5 min to do your best work on the first packet. Remember that this is not a race to see who finishes first. I am interested to see
who works very hard. Put your name at the top of your packet. Do not begin working until I tell you to do so.”

5. Look around the room to see that all students have put their names on their packets. Then, say: “Are you ready? Begin.”

6. When 5 min have passed, approach the students.

7. Instruct the students to stop the first packet and hand in their work. “Stop working now. It is okay if you have not finished. Hold your packets up and I will come and get them.”

8. Collect the students’ packets.

9. Instruct the students: “Now, you are going to work on your second task. Please pull the packet out of your desk and write the #2 at the top of the packet. You will have about 5 min to work on your second task. Remember that this is not a race to see who finishes first. I am interested to see who works very hard. Put your name at the top of your packet. Do not begin working until I tell you to do so.”

10. Look around the room to see that all students have put their names at the tops of their packets. Then, say: “Are you ready? Begin.”

11. When 5 min have passed, approach the students.

12. Instruct the students to stop the second packet and hand in their work. “Stop working now. It is okay if you have not finished. Hold your packets up and I will come and get them.”

13. Collect the students’ packets.

14. Do not provide a consequence to any student, regardless of task engagement.
Choice of Reward (CR) Condition

1. First, deliver any necessary task-specific instructions to the students.

2. Then, deliver these instructions to the students: “You are going to do 2 work packets today. First, you are going to do this packet, [show packet1] and then you are going to do this one [show packet2]. On this task, you will have about 5 min to do your best work. Remember that this is not a race to see who finishes first. I am interested to see who works very hard. If you work very hard today, you will have the opportunity to select a reward.”


4. Instruct the students: “Put your name at the top of your packet. Do not begin working until I tell you to do so.”

5. Look around the room to see that all students have put their names on their packets. Then, say: “Are you ready? Begin.”

6. When 5 min have passed, approach the students.

7. Instruct the students to stop the first packet and hand in their work. “Stop working now. It is okay if you have not finished. Hold your packets up and I will come and get them.”

8. Collect the students’ packets.

9. Instruct the students: “Now, you will have about 5 min to work on this packet [show packet 2]. Remember that this is not a race to see who finishes first. You should try to work very hard. If you work very hard today, you will have the opportunity to select a reward.”

11. Instruct the students: “Put your name at the top of your packet. Do not begin working until I tell you to do so.”

12. Look around the room to see that all students have put their names at the tops of their packets. Then, say: “Are you ready? Begin.”

13. When 5 min have passed, approach the students.

14. Instruct the students to stop the second packet and hand in their work. “Stop working now. It is okay if you have not finished. Hold your packets up and I will come and get them.”

15. Collect the students’ packets.

16. Look for the researcher to indicate to you whether the target student is eligible for reward (i.e., increased his/her task engagement above the NC condition median).

17. You must determine which other students are eligible for reward.

18. Provide all eligible students with opportunities to select a reward.
### CHOICE-RELATED CONDITIONS INTEGRITY CHECKLIST – NC CONDITION

**Directions:** Place a check in the “Yes” or “No” column after each step to indicate whether the teacher completed that step.

<table>
<thead>
<tr>
<th>Did the teacher...</th>
<th>Y</th>
<th>N</th>
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<tbody>
<tr>
<td>1. Deliver any necessary task-specific instructions to the students.</td>
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<tr>
<td>2. Then, deliver these instructions to the students: “You are going to do 2 work</td>
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<td>packets today. First, you are going to do this packet, [show packet 1] and then</td>
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<tr>
<td>you are going to do this one [show packet 2]. On this task, you will have about</td>
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<td>5 min to do your best work. Remember that this is not a race to see who finishes</td>
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<td>first. I am interested to see who works very hard.”</td>
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<td>4. Instruct the students: “Put your name at the top of your packet. Do not begin</td>
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<td>working until I tell you to do so.”</td>
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<td>5. Look around the room to see that all students have put their names on their</td>
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<td>7. Instruct the students to stop the first packet and hand in their work. “Stop</td>
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<tr>
<td>working now. It is okay if you have not finished. Hold your packets up and I will</td>
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<td>come and get them.”</td>
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<td>8. Collect the students’ packets.</td>
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<tr>
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<tr>
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<td></td>
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<tr>
<td>should try to work very hard.”</td>
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<td></td>
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<tr>
<td>11. Instruct the students: “Put your name at the top of your packet. Do not begin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>working until I tell you to do so.”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Look around the room to see that all students have put their names at the tops</td>
<td></td>
<td></td>
</tr>
<tr>
<td>of their packets. Then, say: “Are you ready? Begin.”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. When 5 min have passed, approach the students.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Instruct the students to stop the second packet and hand in their work. “Stop</td>
<td></td>
<td></td>
</tr>
<tr>
<td>working now. It is okay if you have not finished. Hold your packets up and I will</td>
<td></td>
<td></td>
</tr>
<tr>
<td>come and get them.”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. Collect the students’ packets.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. Do not provide a consequence to any student, regardless of task engagement.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Use the following formula to calculate treatment integrity: (Total number of checks in the “Yes” column) / (Total number of checks possible) x (100) = ________________%
### APPENDIX K

**CHOICE-RELATED CONDITIONS INTEGRITY CHECKLIST – CTS CONDITION**

**Directions:** Place a check in the “Yes” or “No” column after each step to indicate whether the teacher completed that step.

<table>
<thead>
<tr>
<th>Did the teacher...</th>
<th>Y</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Deliver any necessary task-specific instructions to the students.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Then, deliver these instructions to the students: “You are going to do 2 work packets today. You are going to do this packet [show packet1] and this packet [show packet2]. I am going to pass out both packets right now, but I want you select the one that you are going to do first. When you have selected the one that you want to do first, write the #1 at the top of that packet. Also, put the other packet inside your desk.”</td>
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<tr>
<td>4. Look around to see that everyone has one packet on their desks. Then instruct the students: “You will have about 5 min to do your best work on the first task. Remember that this is not a race to see who finishes first. I am interested to see who works very hard. Put your name at the top of your packet. Do not begin working until I tell you to do so.”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Look around the room to see that all students have put their names on their packets. Then, say: “Are you ready? Begin.”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. When 5 min have passed, approach the students.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Instruct the students to stop the first packet and hand in their work. “Stop working now. It is okay if you have not finished. Hold your packets up and I will come and get them.”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Collect the students’ packets.</td>
<td></td>
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</tr>
<tr>
<td>9. Instruct the students: “Now, you are going to work on your second task. Please pull the packet out of your desk and write the #2 at the top of the packet. You will have about 5 min to work on your second task. Remember that this is not a race to see who finishes first. I am interested to see who works very hard. Put your name at the top of your packet. Do not begin working until I tell you to do so.”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Look around the room to see that all students have put their names at the tops of their packets. Then, say: “Are you ready? Begin.”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. When 5 min have passed, approach the students.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Instruct the students to stop the second packet and hand in their work. “Stop working now. It is okay if you have not finished. Hold your packets up and I will come and get them.”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Collect the students’ packets.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Do not provide a consequence to any student, regardless of task engagement.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Use the following formula to calculate treatment integrity: (Total number of checks in the “Yes” column) / (Total number of checks possible) x (100) = _______________%
**APPENDIX L**

**CHOICE-RELATED CONDITIONS INTEGRITY CHECKLIST – CR CONDITION**

**Directions:** Place a check in the “Yes” or “No” column after each step to indicate whether the teacher completed that step.

<table>
<thead>
<tr>
<th>Did the teacher...</th>
<th>Y</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Deliver any necessary task-specific instructions to the students.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Then, deliver these instructions to the students: “You are going to do 2 work packets today. First, you are going to do this packet, [show packet 1] and then you are going to do this one [show packet 2]. On this task, you will have about 5 min to do your best work. Remember that this is not a race to see who finishes first. I am interested to see who works very hard. If you work hard today, you will have the opportunity to select a reward.”</td>
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</tr>
<tr>
<td>4. Instruct the students: “Put your name at the top of your packet. Do not begin working until I tell you to do so.”</td>
<td></td>
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</tr>
<tr>
<td>5. Look around the room to see that all students have put their names on their packets. Then, say: “Are you ready? Begin.”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. When 5 min have passed, approach the students.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Instruct the students to stop the first packet and hand in their work. “Stop working now. It is okay if you have not finished. Hold your packets up and I will come and get them.”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Collect the students’ packets.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Instruct the students: “Now, you will have about 5 min to work on this packet [show packet 2]. Remember that this is not a race to see who finishes first. You should try to work very hard. If you work hard today, you will have the opportunity to select a reward.”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Instruct the students: “Put your name at the top of your packet. Do not begin working until I tell you to do so.”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Look around the room to see that all students have put their names at the tops of their packets. Then, say: “Are you ready? Begin.”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. When 5 min have passed, approach the students.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Instruct the students to stop the first packet and hand in their work. “Stop working now. It is okay if you have not finished. Hold your packets up and I will come and get them.”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. Collect the students’ packets.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. Look for the researcher to indicate to you whether the target student is eligible for reward (i.e., increased his/her task engagement above the NC condition median).</td>
<td></td>
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</tr>
<tr>
<td>17. The teacher must determine which other students are eligible for reward.</td>
<td></td>
<td></td>
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<tr>
<td>18. The teacher provides all eligible students with opportunities to select a reward.</td>
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</tr>
</tbody>
</table>
Use the following formula to calculate treatment integrity: (Total number of checks in the “Yes” column) / (Total number of checks possible) x (100) = ________________%
REFERENCES


on a student with attention deficit hyperactivity disorder. *Journal of Applied Behavior Analysis, 30*, 181-183.


