The Effects and Generalization of a Choice-Based Intervention with Highly preferred Items on Student Off-Task Behavior

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Dedication

The entirety of this is gratefully and lovingly dedicated to Audrey Parker Neff Hiney.

Abstract

Opportunities for choice are often taken for granted among individuals without disabilities. Choice is an important dimension of quality of life and a frequent occurrence for many. Many people with disabilities have limited access to making even simple choices. In addition, many individuals with disabilities display problem behaviors that can decrease achievement and put them at risk for exclusion from typical school placements. Choice making is an effective intervention that can help reduce problem behaviors while allowing increased access to choice opportunities. Choice based interventions are person centered and allow an element of self-determination for individuals with disabilities. The concurrent operant paradigm offers a methodology that enhances choice making opportunities. The purpose of this paper was to implement a systematic choice-based intervention based on the concurrent operant paradigm in the classroom with 4 students referred for behavioral difficulties and at-risk for further exclusion from general education.

Keywords: choice, concurrent operant assessment, behavior intervention, school-based

Table of Contents

List of Tables

List of Figures

CHAPTER 1

Introduction

Many individuals with disabilities display problem behaviors that can decrease achievement and put them at risk for exclusion from typical school placements (Finkel, Derby, Weber, & McLaughlin, 2003). These behaviors can also pose serious challenges for families, teachers, and clinicians who work to better outcomes for individuals with disabilities. Although there are numerous ways to intervene with problem behavior, a relatively simple initial intervention is to reinforce adaptive behaviors to help build skills. The concurrent operant literature represents an intersection of preference assessment, behavioral interventions, person-centered planning, inclusion, and choice and self-determination for individuals with disabilities.

While function-based treatments are known to be effective, a functional analysis (FA) cannot always be easily completed (Berg et al., 2007). The positive outcomes for interventions based on FA are well documented, but limitations such as time, resources, clinician skill, and the presence of covert behaviors can limit the applicability of FA (Berg et al., 2007). An alternative strategy is to identify potential reinforcers and implement them within an intervention (Canella, O'Reilly, & Lancioni, 2005). Identifying powerful reinforcers is an important component of successful behavioral interventions for individuals with disabilities (Bowman et al., 1997), as positive reinforcement can increase desired behaviors without the use of punishment. In addition, making selections from stimuli is a prerequisite skill for different forms of discrimination learning, picture exchange communication, and preference assessments (Bourret, Iwata,

Harper, & North, 2012). Identifying powerful reinforcers for individuals with disabilities can be difficult (Fisher et al., 1992), however, as an individual may have difficulty expressing preferences, making choices, or communicating.

Before continuing on this topic, it should be noted that many individuals with disabilities do *not* display problem behaviors and this paper is not meant to convey that problem behaviors are unique to persons with disabilities. Many of the methodologies discussed in this review of the literature may be applicable to individuals without disabilities that display maladaptive behaviors as well, but there is scant research with those populations. As such, the tone of this paper is one of building skills and reducing potentially dangerous or harmful behaviors in order to increase inclusion and enhance outcomes.

Opportunities for choice enhance quality of life and dignity. Most individuals without disabilities are able to make limitless choices throughout the course of their days. Many people with disabilities, however, have relatively limited access to choice making opportunities. Enhancing choice making opportunities for individuals with disabilities may reduce problem behavior (Canella, O'Reilly, & Lancioni, 2005) and increase quality of life (Tullis et al., 2011). In addition, integrating choice into school settings pushes educational practitioners toward a mindset of person-centered planning and self-determination.

The Present Study

The present study examined the effects of an intervention in the general education classroom based on the theory of the concurrent operant paradigm. Skinner (1988) defined an operant as an essential aspect of goal-directed behavior that has some effect

(i.e., operates) on the environment. Concurrent operant arrangements are when two or more responses are simultaneously available and each is correlated with an independent schedule of reinforcement or a different reinforcer (Fisher & Mazur, 1997; Harding et al., 1999).

This study contributed to the concurrent operant and choice-based intervention literature by (1) building on previous concurrent operant intervention work to apply systematic choices in general education classrooms to students at risk for exclusion, (2) following a rubric of methodological rigor for single subject experimental design adapted from Jitendra, Burgess, and Gajria (2011) who originally adapted their rubric from Horner and colleagues (2005), (3) and training teachers and/or educational assistants to implement the intervention in a final generalization phase of the study.

This study also sought to fill important gaps in the existing literature. While there is a rich body of concurrent operant literature, it is lacking in key areas of methodological rigor (see Simonson, 2016). The purpose of the present research was related to preventative versus reactive approaches to behavioral interventions. In short, this research sought to prevent individuals with behavioral needs from exclusion in schools. Much previous literature, while useful, operates from a reactive position. This study also pulled the concurrent operant theory out of the laboratory or clinical setting and implemented it in schools. In addition, the present study expanded the typical participant base from individuals with severe and/or multiple disabilities, to individuals with less severe or no diagnosed disabilities. Finally, the present research sought to expand the intervention agents of this choice-based intervention to teachers.

In examining the utility of a choice based intervention in classrooms for individuals with behavioral difficulties, this study was guided by the following research questions:

1. To what extent does the choice based intervention modeled after the concurrent operant framework reduce identified target behaviors and increase on-task behavior in students with behavioral difficulties?
2. To what extent were teachers able to implement this intervention with fidelity?
3. To what extent was implementation by teachers successful, such that levels of target behaviors remained at similar levels as during the intervention by the author?
4. To what extent does this intervention meet social validity criteria such that teachers find it acceptable and feasible?

Practitioners are bound both legally and ethically to implement evidence-based practices whenever possible. Both the Individuals with Disabilities Education Act (IDEA; Pub. L. No. 101-476) and the Every Student Succeeds Act (ESSA; Pub. L. No. 114-95) calls for practitioners to use evidence-based practices. This movement toward evidence-based practice also aligns with our ethical principles of respect, responsibility, and beneficence. Implementing an evidence-based behavioral intervention provides the best opportunity to help a student decrease challenging behavior and increase adaptive behavior to better function with her or his peers. Ideologically, these principles are linked to person-centered thinking, as decreased problem behavior can help us better plan around what is important to the child while also focusing on what is important for the

child. This study sought to expand the repertoire of evidence-based practices available to practitioners. The underlying goal of increasing choice-making opportunities for individuals with disabilities and expanding the range of available interventions is to enhance access to the general education setting and reduce exclusion of individuals with disabilities.

CHAPTER 2

Literature Review

Opportunities for choice are often taken for granted among individuals *without* disabilities. Choice is seen as an important dimension of quality of life (Martin, Yu, Martin, & Fazzio, 2006) and opportunities for choice may increase overall quality of life (Tullis et al., 2011). Many of us are able to make a myriad of choices in a variety of situations across contexts and over time. Choice making is a constant process that enhances our dignity and self-determination. Many people with disabilities have limited access to making even simple choices (e.g., Guess, Benson, Siegel-Causey, & Agran, 2008; Houghton, Bronicki, & Guess, 1987). Opportunities for choice reduce problem behavior and increase engagement with tasks (Canella, O'Reilly, & Lancioni, 2005). In fact, children with and without disabilities tend to prefer conditions in which they can make choices. Choice may simply be a valuable event that can be included in reinforcement-based interventions (Tiger, Toussaint, & Roath, 2010).

In addition, as discussed above, the ability to discriminate between stimuli and make a choice is an important skill. Providing choice-making opportunities is an experience that typically developing children encounter at a young age. As such, some authors argue that providing choices to individuals with disabilities is part of a normalization process (Fisher et al., 1997). While "normalization" is a potentially problematic word, the authors asserted that this term helps mirror the opportunities that typically developing children experience. Reinforcer assessment procedures that allow opportunities for choice approximate more natural contexts in which individuals are able to select between simultaneously available items, foods, or activities (Finkel et al., 2003).

As the fields that focus on working with individuals with disabilities shift to a mindset of person-centered planning, there is a greater emphasis on choice. Expressing preferences and making choices are two key components of person-centered planning and self-determination (Dozier et al., 2007). Concurrent operants offer a framework for individuals with disabilities and limited communicative ability to make choices (Dozier et al., 2007). Choice making is an effective intervention that can help reduce problem behaviors while maintaining a person-centered perspective (Canella, O'Reilly, & Lancioni, 2005), as opposed to typical interventions that tend to be prescriptive. In addition to assisting with behavioral interventions, the opportunity to make choices is a beneficial component of instruction and instructional techniques for persons with disabilities (Lerman et al., 1997).

Choice may provide access to preferred or relatively preferred stimuli (Fisher et al., 1997). There is also some evidence that choice itself is reinforcing and that both humans and animals prefer choice to no-choice conditions. Research demonstrates that appropriate behaviors increase and problem behaviors decrease when choice is provided (e.g., Fisher et al., 1997). Individuals prefer the ability to make choices even when a choice condition and a no-choice (fixed) condition both produce the same outcome (Fisher et al., 1997) or provide access to the same reinforcers (Geckeler et al., 2000). Similarly, when tasks, activities, and reinforcers are self-selected (i.e., chosen), more on-task behavior and less inappropriate behavior results (Canella, O'Reilly, & Lancioni, 2005; Lerman et al., 1997), and there is some evidence for increased rate of learning (see Guess, Benson, Siegel-Causey, & Agran, 2008 for a brief review on this topic). There is also evidence to suggest that the ability to make choices results in higher rates of

responding for some individuals (Geckeler et al., 2000). While much of the research in this field has been conducted with individuals with severe disabilities and limited communicative ability, there is a growing body of research demonstrating similar effects for individuals with mild to moderate disabilities (Canella, O'Reilly, & Lancioni, 2005).

It should be noted that there are some mixed results on whether choice itself is inherently reinforcing (e.g., Fisher et al., 1997; Lerman et al., 1997). The studies that demonstrated inconclusive findings or that found choice to be equal to no choice conditions utilized highly preferred items across conditions. One such study concluded that access to preferred items may be the most critical (Fisher et al., 1997), regardless of the choice condition. Other researchers have, however, determined that choice may be beneficial when nonpreferred tasks or items are available such as academic tasks (Lerman et al., 1997). These studies represent a small minority in the literature base, however.

With this in mind, frequent choice making may increase the likelihood of a person accessing the most preferred tasks, reinforcers, or activities that are available at that time (Lerman et al., 1997). In addition, in a review of 50 studies on preference assessment methodologies and effects of choice on behavior, Tullis and colleagues (2011) found positive results in the majority of studies and asserted that choice interventions may be viewed as an evidence-based practice for individuals with disabilities. As such, while a minority of studies found that choice might not be inherently reinforcing, choice based interventions have demonstrated overwhelmingly positive results. This evidence base, combined with the fact that choice is an inherent aspect of life for individuals without disabilities and a core component of person-centered planning makes exploration of choice-based interventions a critical issue in behavioral and educational studies. In

addition, as discussed above, choice procedures offer many benefits over fixed response (no-choice) procedures such that they allow access to choices, help teach discrimination learning, are preferred to individuals with and without disabilities, usually demonstrate positive results, and frequently more positive results relative to fixed or no-choice procedures.

Treatments based on FA and functional behavior assessments (FBAs) are often effective and tend to be acceptable to parents and teachers (Berg et al., 2007). Choice interventions are also highly acceptable and practical because they are easy to implement and provide access to highly preferred items with no aversive techniques (Canella, O'Reilly, & Lancioni, 2005). There is little attention paid to whether individuals would prefer to participate in the treatment, however (Dozier et al., 2007). Many typically developing children and adults can choose to participate in a treatment or not. Even when treatment is compulsory, adjustments are made to make it more appealing. If an individual prefers treatment, treatment is more likely to be successful and less likely to be resisted. Similarly, if a person prefers a baseline condition (no treatment), then the treatment can be made more appealing for that person and still function to increase their self-determination and adaptive behavior (Dozier et al., 2007). Choice procedures also offer the opportunity for the individual to make selections to enhance the appeal of the intervention.

Definitions and Terms

Concurrent operant assessments are also called forced-choice assessments, paired-choice assessments, and paired-stimulus assessments. These terms are used interchangeably throughout the literature and will be referred to as concurrent operant

assessments in this paper, or concurrent operants. Concurrent operants are rooted in behaviorism and operant conditioning pioneered by B.F. Skinner. Skinner (1988) defined an operant as an essential aspect of goal-directed behavior that has some effect (i.e., operates) on the environment. As such, operant behavior and operant conditioning refer to behaviors that are guided by their consequences (from the environment). An operant is strengthened when the behavior is followed by a response that is reinforcing (Skinner, 1988). Thus, concurrent operants are when two or more potential operants are simultaneously available.

The concurrent operant paradigm offers a methodology that enhances choice making opportunities, helps build the skill of making selections, can identify preferences and potential reinforcers, and can be implemented in an intervention framework. Concurrent operant arrangements are when two or more responses are simultaneously available and each is correlated with an independent schedule of reinforcement or a different reinforcer (Fisher & Mazur, 1997; Harding et al., 1999). This framework allows experimenters to study choice and why an individual may emit one response instead of another. Because two responses are in competition, an individual must distribute their responding in accordance with relative preference (Fisher & Mazur, 1997). The framework also allows for highly sensitive methods of assessing preference for potential reinforcers. The variables that influence choice responding are often studied in a concurrent operants arrangement.

Within this literature, one must also differentiate between preference, choice, and reinforcement. Preference is more frequent response allocation toward one stimulus when more than one is concurrently available (Dozier et al., 2007). Individuals express their

preferences through the use of choice (Cannella, O'Reilly, & Lancioni, 2005). While not immediately intuitive, a preference assessment does not necessarily identify reinforcers nor does it evaluate the reinforcing effects of stimuli (items identified in the preference assessment; Piazza et al., 1996). Instead, preference assessments identify preferences of certain items relative to the other items presented. As preference may be relative to another item, rather than inherent preference, the stimulus will not necessarily function as a reinforcer. For example, a piece of gum may be paired with a small toy during the preference assessment. One might prefer the gum relative to the small toy, but that does not necessarily mean the gum will function as a reinforcer and increase the probability of a behavior occurring again in the future. This only means that the gum was preferred relative to the toy.

The most preferred items identified in a preference assessment are often used in a reinforcer assessment to assess their ability to function as a reinforcer (Piazza et al., 1996). One can only refer to a stimulus as a reinforcer if it increases the probability of a behavior occurring in the future. For example, verbal praise might motivate one student and increase the probability that they will complete an assignment again in the future in order to obtain further verbal praise. A second student may find the same stimulus (verbal praise) aversive. As such, verbal praise will not increase the probability of the student completing an assignment. In this example, verbal praise functions as a reinforcer for the first student but not the second student. Similarly, in the previous example, gum was a relatively preferred item but not necessarily a reinforcer.

An important distinction from other bodies of research with individuals with disabilities is that concurrent operants allow for choice. Forced-choice assessments are

sometimes synonymous with concurrent operants, and should be differentiated from research that uses the term "forced-choice" synonymously with "no-choice." Some research refers to presentation of a single stimulus as forced-choice, but this is a misnomer that should be understood as no-choice or single-stimulus presentation. In addition, multiple stimulus preference assessment methods, in which more than two stimuli are presented, also represent a concurrent operants framework. For the purposes of this paper, concurrent operants will refer to methodologies in which two stimuli are presented.

Concurrent Operant Assessments

With the previously defined terms in mind, the following section will introduce general methodologies of concurrent operant assessments for preference assessments and in a reinforcer assessment or intervention framework. Much of the literature has focused on manipulating small aspects of the concurrent operant arrangement and observing the effects. These manipulations will be discussed in a later section.

Preference assessment. Concurrent operant arrangements are often used as a preference assessment methodology. Generally, these assessments start with a generated list of possible preferred items or possible reinforcers. Several studies utilize the Reinforcer Assessment for Individuals with Severe Disabilities (RAISD; e.g., Bowman et al., 1997; DeLeon et al., 2001; Fisher et al., 1997) developed by Fisher, Piazza, and Bowman (1996), to generate a list of potential preferred stimuli. The RAISD is a structured interview that helps caregivers create a list of possible reinforcers. Other studies simply ask caregivers or teachers to generate a list of preferred items. A smaller

number of studies simply use an a priori list of possible preferred items. The number of stimuli per individual varies across the literature.

In a concurrent operant preference assessment, each identified stimulus is paired with every other stimulus. The individual is given an opportunity to make an approach response, which may involve reaching toward, pointing to, or walking toward an item depending on the arrangement of the room. An approach response typically results in a short period of access to the item. Attempts to access both items are blocked and the procedure is repeated (e.g., Bowman et al., 1997). When each stimulus has been paired with every other stimulus, a trial is complete. Because each stimulus is paired with every other stimulus, relative preference can be determined based on the number of times an item was chosen. Items that were chosen the most frequently are hypothesized to be stronger reinforcers than those chosen fewer times. Choice procedures are preferable to some other procedures (such as single-stimulus) as they produce greater differentiation among stimuli (Piazza et al., 1996).

Reinforcer assessment. Following a preference assessment, many researchers then conduct a reinforcer assessment with high, medium, and low preference items (e.g., Finkel et al., 2003; Piazza et al., 1996). Reinforcer assessments typically define a target behavior (e.g., completing work, sitting in a chair) based on the skills of the individual. The reinforcer assessment utilizes a concurrent operants paradigm. Reinforcer assessments can be conceptualized as an intervention to the extent that they provide evidence for the utility of concurrent operants in an intervention framework. Studies differ in how many responses are available during the reinforcer assessment but often have two or three where an item from the preference assessment is paired with another

item from the preference assessment and/or a control condition in which there is no item. The participant can then allocate their response (the target behavior) to any of the preferred items presented.

For the example of sitting in a chair, one study had three chairs available (Piazza et al., 1996). Two chairs contained items from the preference assessment and the third chair was empty (control). The target behavior (in-seat) resulted in immediate access to the stimulus. The seat that was chosen contained an item that functioned as a reinforcer because it increased the occurrence of in-seat behavior. Importantly, even if the other item was identified as highly preferred, it did not function as reinforcer because it did not increase the occurrence of behavior. Often, the relative preference for stimuli during the preference assessment is predictive of the relative reinforcing value of that stimulus (Harding et al., 1999).

Intervention. In some studies, the reinforcer assessment functions as a pseudo-intervention because the researchers focused on increasing an adaptive behavior while decreasing problem behavior. However, the purposes of most of those articles are not to identify an intervention strategy. Most often, concurrent operant reinforcer assessments are utilized with the purpose of identifying strong reinforcers.

Concurrent operant arrangements can be used in various ways in an intervention, as well. Some studies allow choice among preferred stimuli after eliciting a target response (e.g., Lerman et al., 1997). Other studies have had two sets of identical work in a room paired with different preferred stimuli, and the child is allowed to choose which item they will work to obtain (e.g., Finkel et al., 2003).

Overall, concurrent operants have a strong research base (Roane, Vollmer, Ringdahl, & Marcus, 1998). In addition, choice-making opportunities can improve the efficacy of interventions that seek to increase adaptive behavior or decrease problem behavior (Lerman et al., 1997). Choices are also important as they enhance the dignity and self-determination of individuals with disabilities while also functioning as a useful clinical tool (Lerman et al., 1997).

This intervention methodology begins to bridge the gaps between evidence-based practice, behaviorism, and self-determination for individuals with disabilities. Self-determination is related to the innate psychological needs of competence, relatedness, and autonomy (Ryan & Deci, 2000). Choice can enhance intrinsic motivation by enhancing autonomy. Autonomy, in turn, can enhance feelings of competence (Ryan & Deci, 2000). These opportunities are important because adults with disabilities have emphasized the desire for increased choice and control over their lives (Wehmeyer & Schwartz, 1997). Some evidence suggests that building in opportunities for self-determination earlier in life may enhance later quality of life (Wehmeyer & Schwartz, 1997). The ability to make choices is limited in many areas of life for people with disabilities, and is rarely included in behavioral interventions. Other widely used behavioral intervention techniques provide opportunities to respond, build skills, and decrease problem behavior, but do not incorporate choice into the actual intervention.

As defined by the What Works Clearinghouse (WWC), only 18 interventions have positive or potentially positive effects on behavior. Of those, only four address behavioral needs at the individual or small-group level. Importantly, these four interventions are not as easily tailored to the unique needs of many students with

disabilities and behavioral difficulties (U.S. Department of Education). Researchers and practitioners must build their repertoire of evidence based behavioral interventions for students. No single intervention will work for all students, but concurrent operants may be sufficiently flexible and student-focused to address many behavioral issues that may not be addressed by other evidence-based interventions.

While the WWC is not the only source of evidence-based practices, the relatively few interventions identified by them indicates a need for expansion of knowledge and further development of tools for practitioners. Further investigation of the concurrent operant framework is warranted as it may lead to the development of another evidence-based behavioral intervention that practitioners can use; one that incorporates choice, can be tailored to meet the needs of a student, and is effective at reducing problem behaviors without the use of aversive techniques.

Two previous reviews of the concurrent operant literature (Canella, O'Reilly, & Lancioni, 2005; Tullis et al., 2011) focused on the results of preference assessments and choice on behavior, rather than the use of the concurrent operant framework within an intervention. Both reviews demonstrated positive results, but differed in their interpretation. Canella and colleagues (2005) found most studies had clearly positive results, but cautioned that there was not enough data to suggest choice and preference methods will be effective at all times or for all individuals. Tullis and colleagues (2011) similarly found mostly positive results, but asserted that choice interventions can be viewed as an evidence-based practice for individuals with disabilities.

The present author conducted a systematic literature review of concurrent operant interventions in the schools that drew similar conclusions (Simonson, 2016) to the

previously mentioned literature reviews. The reviewed studies provided evidence for concurrent operant frameworks as an effective intervention in the schools. While the research varied in who implemented the intervention, the type of setting in the school, the target behavior/outcome, and design, most studies demonstrated positive or potentially positive effects. Each study at least partially met the indicator for the social importance of the variable in question as well as the magnitude of change in that variable. As such, most of the present research investigated variables that are socially important (e.g., increase student responses, decrease problematic behaviors) for individuals with behavioral difficulties. In addition, the procedures utilized resulted in generally large or important changes in behavior between baseline and intervention phases. Thus, most participants in most studies showed substantial change in a socially important behavior (Simonson, 2016).

In the results of the author's previous review (Simonson, 2016), more than five studies met minimally acceptable criteria, were conducted by different researchers in different geographic locations (e.g., Northeast US, Northwest US, Southern US), and had a total of more than 20 participants. The shortcomings in most of the reviewed research had more to do with inadequate definitions than methodological flaws that undermine causal inferences and magnitude of change. As such, the findings of this review meet the criteria to consider choice-based intervention procedures an evidence-based practice in school settings (e.g., Jitendra et al., 2012; Kratochwill et al., 2010). One should not over-generalize the results of these studies to assume that choice-based interventions will work for all individuals, target behaviors, or settings.

What is clear across previous reviews (Canella, O'Reilly, & Lancioni, 2005; Tullis et al., 2011) is that a relatively simple procedure can decrease problem behavior and increase adaptive behavior while integrating choice for individuals with disabilities. In addition, choice-based concurrent operant interventions have a developing evidence base for use in the schools (Simonson, 2016). Practitioners may implement concurrent operant interventions as a relatively simple and time-efficient method to reduce problematic behaviors. Concurrent operant interventions can be applied with a student demonstrating behavioral difficulties before more time- and expertise-intensive procedures like FBAs and FA are required.

In addition to having a strong evidence base, the concurrent operant framework may allow educational practitioners to expand their repertoire of evidence-based interventions that help students succeed in general education. Both ethical statutes and the law require educational practitioners to educate students in the least restrictive environment (LRE). The LRE is a legal principle within the Individuals with Disabilities Education Act (IDEA; Pub. L. No. 101-476) that children with disabilities are to be educated in an environment as close as possible to the general education environment (Howard, 1994; Osborne & Dimattia, 1994). At its heart, the IDEA is a civil rights law, and the LRE aligns itself with the principle of antidiscrimination (Turnbull, 2005). General education classes with necessary supplementary services are always considered the least restrictive by the law.

Arguments against special education placements and in favor of general education date back several decades. Dunn (1968) pioneered work demonstrating that students with disabilities made as much or more progress in general education. There is some evidence

to suggest that outcomes are generally more positive for students in general education. In a large-scale study of over 8,000 youth receiving special education from 1985-1986, the National Longitudinal Transition study (NLTS) found that students who spent time in general education were less likely to be socially isolated and more likely to go on to some postsecondary education (Wagner, 1991). Some research also demonstrates better academic outcomes for students in inclusive (general education) settings such as higher grades, higher test scores, and higher attendance than students in segregated settings (Rea, McLaughlin, & Walther-Thomas, 2002). As such, educational practitioners must weigh the morality and ethics of inclusion versus segregation.

Based on the author's previous review (Simonson, 2016), the concurrent operant framework as an intervention has a growing evidence base. The Every Child Succeeds Act (Pub. L. No. 114-95) calls educational practitioners to utilize scientifically based practices. Similar calls are evident in professional codes of ethics (e.g., The National Association of School Psychologists' Principles for Professional Ethics, 2010). In addition, appropriate interventions may assist a child to better function in general education with his or her peers. As such, it behooves educational researchers and practitioners to further investigate potential evidence-based behavioral interventions.

Summary and Conclusions

With an ever-increasing focus on evidence-based practice from a legal and ethical standpoint, investigations into relatively novel behavioral intervention techniques are highly relevant to educational practice. In addition, choice and self-determination continue to be important constructs within person centered planning and thinking. The purpose of the present study was an attempt to bring these conceptual areas together with

a choice-based intervention that requires more rigorous investigation to determine if it is an evidence based practice, for whom, and under what conditions.

The aforementioned reviews of the literature illuminate important gaps in the present body of research that this study will attempt to address. This study contributed to and filled gaps in the concurrent operant and choice-based intervention literature in several ways. First, this study sought to build on previous concurrent operant intervention work to apply systematic choices in general education classrooms to students at risk for exclusion. This expanded on previous literature by shifting the concurrent operant theory out of highly controlled clinical settings into general education classrooms. This, in turn, also expanded the participant pool to individuals with less severe or no diagnosed disabilities. Few applications of the concurrent operant framework in schools are evident in the published literature and no studies were located that operated in the general education classroom. Similarly, no identified studies included participants with behavioral difficulties but no diagnosed disabilities.

Shifting the setting and participants allowed for a more preventative versus reactive approach to treating behavioral needs. In short, this research sought to prevent individuals with behavioral needs from exclusion in schools. Much previous literature, while useful, operated from a reactive position with individuals who were already excluded from more typical settings and peers. As discussed above, it is a legal and ethical imperative to ensure that students receive evidence based interventions in the least restrictive environment and are prevent from exclusion, when possible.

Next, the present study followed a rubric of methodological rigor for single subject experimental design adapted from Jitendra, Burgess, and Gajria (2011) who

originally adapted their rubric from Horner and colleagues (2005). All previously reviewed research had methodological flaws (see Simonson, 2016 and the above discussion of results from that review). Though not serious flaws that undermine the causal inferences one can make, this still presented an opportunity for growth in the body of research.

Finally, the present research sought to expand the intervention agents of this choice-based intervention modeled after the concurrent operant framework from mostly researchers and clinicians to teachers. The author trained teachers to implement the intervention in a final generalization phase of the study. This was a key component missing from nearly all identified concurrent operant research. Shifting the intervention agent to individuals that typically interact with students in the classroom is key to affecting long-term generalization and implementation of evidence based interventions. This shift also progresses the field forward to set the stage for future research. This study sought to expand on previous work, as explained above, as well as to add some extra methodological rigor to improve arguments for the concurrent operant framework as an evidence based intervention. From here, research could progress by continuing to expand different directions such as applying the concurrent operant framework with other populations, in other settings, or replicating this work in schools.

This study sought to add to the growing intervention literature on the use of choice based interventions. In examining the utility of the intervention based on the concurrent operant framework in classrooms for individuals with behavioral difficulties, this study was guided by the following research questions:

1. To what extent does the choice based intervention modeled after the concurrent operant framework reduce identified target behaviors and increase on-task behavior in students with behavioral difficulties?
2. To what extent were teachers able to implement this intervention with fidelity?
3. To what extent was implementation by teachers successful, such that levels of target behaviors remained at similar levels as during the intervention by the author?
4. To what extent does this intervention meet social validity criteria such that teachers find it acceptable and feasible?

CHAPTER 3

Method

Participants and Setting

Individuals that met the following criteria were eligible for participation in this study: (a) the child had an identified emotional or behavioral disability in the school setting based on a full evaluation and functional behavior assessment or displayed challenging behavior in the general education setting problematic enough that the child was referred to a problem-solving team, (a.1) if the child did not have an identified educational disability, they must have been referred to a problem-solving team where previous interventions were tried, (b) the teacher reported that the child engaged in challenging behavior during one or more core instructional periods, (c) documentation demonstrated that previous interventions failed, (d) the child was at risk for exclusion or further exclusion from general education due to the challenging behavior such that problem-solving teams discussed more restrictive interventions or placements, (e) the student displayed the target behavior for a median of 50% or more intervals in direct observation of behavioral base rate across three sessions (discussed more below), (f) the parent/guardian consented (see Appendix A for consent form), and (g) child assented (see Appendix B for assent form) to participate in the study.

Teachers and the problem solving team at one elementary school in one upper Midwest school district referred 7 students between the ages of 6 and 10 who potentially met criteria for participation. In total, four individuals with high rates of behavioral challenges in the general education setting participated in the study. Three students were

excluded from the study in total. The author was unable to obtain consent for two of the students. One student did not meet the minimum base rate criterion after referral.

Derrel was a 7 year-old boy in first grade with a history of behavioral challenges in his classrooms since pre-Kindergarten age. Derrel did not have an identified disability at the time of this study and spent his full day with his general education peers. His teacher reported that he had significant behavioral challenges throughout the day, with behavioral challenges being the most pronounced during.

Derrel's intervention history prior to first grade was unclear. He was referred to the problem-solving team early in the school year to address behavioral difficulties and implement interventions. He participated in small group and individualized interventions both in class and out. Behavioral and social/emotional interventions included small group social skills work, a goal chart with stickers, and intensive reading interventions (based on the hypothesis that low academics contributed to behavioral difficulties). His behavior remained relatively unchanged and he was brought back to the problem-solving team two more times (every six weeks).

After multiple failed interventions, Derrel was referred to this study. Derrel's target behaviors included verbal disruptions, physical aggression, and noncompliance. For Derrel, verbal disruption was defined as any audible noise or word when students were not supposed to be talking or to peers about nonacademic topics. Physical aggression was defined as Derrel's body touching the body of another peer in an aggressive manner including punching, kicking, slapping, biting, pushing, and tackling. Noncompliance was defined as active or passive refusal to do his work such as putting

his head down, tearing up his paper, crying, throwing his body to the floor, and walking out of his assigned area.

Upon conducting base rate sampling observations, Derrel engaged in a median of 55% of intervals with his challenging (target) behaviors. Derrel's teacher reported that his high rate of behavior made it likely that he would continue to bring Derrel to the attention of the problem solving team. This can result in exclusion from general education and/or referral for a special education evaluation. As such, Derrel met all criteria for inclusion in this study.

Alton was an 8 year-old boy in second grade with a history of behavioral challenges in his classrooms since at least Kindergarten. Alton did not have an identified disability at the time of this study and spent his full day with his general education peers. His mother was pursuing a medical diagnosis of attention-deficit/hyperactivity disorder. His teacher reported that he had significant behavioral challenges throughout the day with high rates of behavior. She was unable to determine a time of day that was more challenging than others.

Alton received interventions as early as Kindergarten, though the documented history was incomplete. He received in school therapy from a partnership with a local clinic during first grade. Information regarding his therapy was not available. Alton was referred to the problem-solving team during the first meeting of the school year to address his behavioral challenges and implement interventions. Alton had a variety of interventions and accommodations including using a wiggle cushion, fidget, individual therapy, a modified check and connect program, a sticker chart, small group social skills, proximity seating to teacher, and goal setting in the morning. Alton was brought to the

problem solving team several more times throughout the year before the start of this intervention. His behavior remained relatively unchanged despite numerous interventions and strategies. The sticker chart was discontinued after three months as it was unsuccessful and seemed to increase behaviors. He also did not show progress in a small group skills intervention.

After multiple failed interventions, Alton was referred to this study. Alton's target behaviors included verbal disruptions, physical aggression, and elopement. For Alton, verbal disruption was defined as any audible noise or word when students were not supposed to be talking or to peers about nonacademic topics. Physical aggression was defined as Alton's body touching the body of another peer in an aggressive manner including punching, kicking, slapping, biting, pushing, and tackling. Elopement (or out of area) was defined as his body getting up from his assigned spot or leaving the classroom (in the cases where students were allowed to move about the room). Any instance of moving his body from touching his chair or assigned seat for more than three seconds was counted as an instance of elopement.

Upon conducting base rate sampling observations, Alton engaged in a median of 68% of intervals with his challenging (target) behaviors. Alton's teacher reported that his high rate of behavior made it likely that she would continue to bring Alton to the attention of the problem solving team. This can result in exclusion from general education and/or referral for a special education evaluation. As such, Alton met all criteria for inclusion in this study.

Jerrod was a 9 year-old boy in third grade with a history of behavioral challenges in his classrooms, but with limited data as he was new to this school. Jerrod did not have

an identified disability at the time of this study and spent his full day with his general education peers. His mother was pursuing a medical diagnosis of attention-deficit/hyperactivity disorder. His teacher reported that he had significant behavioral challenges throughout the day with high rates of behavior. She was unable to determine a time of day that was more challenging than others because he was estimated to be off task 90% or more of the time.

Jerrod's intervention history was not available as he was new to this school and district. He received in school therapy from a partnership with a local clinic. Information regarding his therapy was not available. Jerrod was referred to the problem-solving team during the first meeting of the school year to address his behavioral challenges and implement interventions. Jerrod's teacher tried a variety of interventions and accommodations including structured breaks, preferential seating, 1:1 attention, a check-in checkout program, and a sticker chart. He was also a part of a small group social skills intervention. Jerrod's behavior remained relatively unchanged despite numerous interventions and strategies.

After multiple failed interventions, Jerrod was referred to this study. Jerrod target behaviors included verbal disruptions, physical aggression, and noncompliance. For Jerrod, verbal disruption was defined as any audible noise or word when students were not supposed to be talking or to peers about nonacademic topics. Physical aggression was defined as Jerrod's body touching the body of another peer in an aggressive manner including punching, kicking, slapping, biting, pushing, and tackling. Noncompliance was defined as active or passive refusal to do his work such as putting his head down, tearing

up his paper, crying, hiding in the classroom cabinet, and walking out of his assigned area.

Upon conducting base rate sampling observations, Jerrod engaged in a median of 85% of intervals with his challenging (target) behaviors. Jerrod's teacher reported that his high rate of behavior made it likely that she would continue to bring Jerrod to the attention of the problem solving team. This can result in exclusion from general education and/or referral for a special education evaluation. As such, Jerrod met all criteria for inclusion in this study.

Nils was a 9 year-old boy in third grade with a history of behavioral challenges in his classrooms since at least first grade. Nils did not have an identified disability at the time of this study and spent his full day with his general education peers. His teacher reported that he had significant behavioral challenges throughout the day with high rates of behavior. He could not differentiate if literacy or mathematics was a more difficult time for Nils.

Nils had a history of low attendance (between 70-85%) and behavioral needs. It was unclear what interventions were attempted in previous years. Nils was referred to the problem solving team early in the year due to significant behavioral challenges and aggression toward peers. He was moved to a different classroom at the beginning of the second month of school to see if he would function better with different peers. Nils started a sticker chart and check-in checkout program in his new classroom. He also started in an intensive, evidence based academic intervention to address reading difficulties. He made progress with reading and his sticker chart goals (stay in the classroom, following directions). The sticker chart was discontinued after several months,

but reinstated after a severe regression in behavior. Even with some success in these interventions, Nils maintained a high rate of off-task and noncompliant behavior. He was consistently referred to the problem-solving team.

After these interventions did not ameliorate Nils's more significant challenging behaviors, he was referred to this study. Nils's target behaviors included work avoidance, elopement, and verbal aggression. For Nils, work avoidance was defined as active or passive refusal to do work such as putting his head down, tearing up his paper, staring without responding to prompts, or walking around the classroom. Elopement was defined as any period of three or more seconds in which his body was not in his assigned space or seat, as well as any instance of leaving the classroom. Verbal aggression was defined as Nils raising his voice and using an angry or threatening tone directed toward peers or staff.

Upon conducting base rate sampling observations, Nils engaged in a median of 53% of intervals with his challenging (target) behaviors. Nils' teacher reported that his high rate of behavior and work avoidance made it likely that he would continue to bring Nils to the attention of the problem solving team. This can result in exclusion from general education and/or referral for a special education evaluation. As such, Nils met all criteria for inclusion in this study.

Preference Assessment

Prior to the start of the each intervention phase of the study, participants were exposed to a paired-stimulus preference assessment identify each participant's most preferred items (e.g., Berg et al., 2007). The experimenter asked both the teacher and the participant to identify the participant's most preferred items or activities. This process was

based on an adapted version of the Reinforcer Assessment for Individuals with Severe Disabilities (RAISD; Fisher, Piazza, Bowman, & Amari, 1996) and other readily available reinforcement menus (see Appendix C for the experimenter created potential reinforcement interview). The RAISD is a structured interview that provides prompts regarding categories of possible preferred stimuli. This helped facilitate generating a variety of potential reinforcers (Bowman et al., 1997). The RAISD was used as a guide for questions to ask students and teachers for students with less severe or no identified disabilities. The potential reinforcement interview resulted in a list of between 10-12 potentially preferred items for each student prior to each intervention phase.

Each item was matched one time with each other item to complete a session (Berg et al., 2007). As such, there were between 45 and 66 trials per student to complete one full session. The experimenter created the preference assessments utilizing Qualtrics, an online survey building software (Qualtrics, Provo, UT). Utilizing Qualtrics allowed for the automatization of the preference assessments. The preference assessment was designed so that an image of each potentially preferred item appeared alongside each other potentially preferred item one time. Two images appeared on opposite sides of the computer screen. The participant was asked his preference between the two. The software allowed a choice of only one item and the student had to select one before continuing the preference assessment. The two items chosen on the highest number of trials were used in the study.

This preference assessment procedure was repeated before starting each new phase of the study to account for satiation with food items or changing preferences. Teachers administered the preference assessment prior to the final intervention phase. The results of the preference assessment yielded a hierarchy of preferred items and activities

for each student. In the event that the preference assessment yielded a tie between items/activities, a smaller preference assessment was conducted with just the tied items to determine a better hierarchy within that subset.

Dependent Variables and Data Collection

Target behaviors outlined above for each student were measured utilizing paper-and-pencil 10s partial interval direct observations. The target behavior was recorded as an occurrence if it was observed at any time during each 10s interval. Off-task passive behaviors had to occur for three consecutive seconds to count as an incidence of behavior. All other behaviors were recorded from a single occurrence. Direct observation occurred for the duration of the sessions across each phase of implementation. Through this recording procedure, off-task and on-task behavior could not co-occur within a single interval. As such, the absence of off-task (target) behavior indicates on-task behavior when interpreting results. Each student had more than one target behavior. For the purposes of this study, data were not collected on separate target behaviors; rather, all behaviors were monitored simultaneously and recorded as occurring or not occurring. See discussion above for each participant's target behaviors.

Interobserver Agreement (IOA) and Fidelity of Implementation (FOI)

Trained graduate students acted as second independent observers for reliability data collection for at least 20% of the sessions (average IOA sessions of 21.59% across all phases for all students) in each phase of implementation with each participant (Kratochwill et al., 2010). During reliability coding, the experimenter and an independent observer both utilized the 10s partial interval recording system to observe the occurrence and nonoccurrence of the target behaviors. Session by session IOA was calculated by

comparing the percentage of intervals of occurrence of the target behavior identified by the primary data collector with that of the secondary data collector. IOA was calculated by dividing the number of agreements by the number of agreements plus disagreements and multiplying by 100%. The mean IOA was 97.93% (range 92.50-100%).

The experimenter created a rubric for fidelity of implementation that contained all necessary steps of the choice-based intervention (see Appendix D). The secondary data collector rated the experimenter on FOI during the same session in which they were collecting reliability (IOA) data. As such, FOI data were collected across at least 20% of sessions (average FOI sessions of 23.68% across all phases for all students) in each intervention phase for each student. The author collected treatment fidelity on teachers across 100% of the sessions during the generalization phase. Treatment fidelity was calculated by dividing the number of procedural steps completed correctly by the total number of steps for the intervention, then multiplied by 100%. Treatment fidelity was 100% across primary intervention conditions and was 92.50% (range 75-100%) across the generalization condition.

Experimental Design

The effect of systematic introduction of choice was evaluated for each participant within an ABABC design in which "A" represented the baseline (business-as-usual) condition. Phases "B" and "C" both included the choice-based intervention, with phase "B" implemented by the experimenter and phase "C" implemented by the classroom teacher (generalization). Phase changes were determined based on visual analysis and consultation with experts in single case design. The author specifically looked for stable trends and level changes when determining phase changes after a minimum of at least

three data points, but with a preference for five data points per phase. When adding or removing the intervention, immediate level changes were of particular interest during visual analysis. Five data points were collected whenever possible, though time constraints required three or four data points per phase in some cases.

Procedures

Sessions were 10 minutes in length with the exception of 3 sessions that were 7 minutes in length. One to two sessions were conducted per day 1-3 times per week. The primary author served as the interventionist for all students across all "B" phase sessions. The primary author also served as trainer to the teachers for the generalization phase (phase "C"). All sessions were conducted within the participant's general education classroom during literacy or math instructional times. Sessions were started at each student's desk whenever possible, but occasionally at a table at the back of the student's general education classroom based on teacher preference. The experimenter checked for student understanding prior to the initiation of each session. The student then returned to their desk or table, when applicable, to complete the session.

Baseline

During baseline, teachers were asked to maintain their typical routine during their daily schedule, which included the targeted area of difficulty for the student (a primary instructional period). Observers arrived in the classroom in between lessons and were seated in an inconspicuous location within the classroom prior to the beginning of class. Participants were observed for at least five total sessions, or until a stable baseline was obtained. Baseline observation sessions were 10 minutes in length. The return to baseline

(second "A" phase) followed the same procedures. Due to time constraints, one student had four data points in the return to baseline phase.

Choice-Based Intervention Modeled After the Concurrent Operant Framework with Highly Preferred Items

During the intervention ("B") phases, students were either brought to a table at the back of the classroom or discreetly talked to at their desk to confirm that the student understood what they were to work on as instructed by the teacher. The student then returned to their desk. If they understood the task, the intervention proceeded with reinforcer selection. If the student did not understand the task, they were instructed to raise their hand to ask for clarification. For reinforcer selection, two cards with the names of the top two items/activities from the preference assessment were placed on each left and right half of the student's desk. All students were able to read these cards. The student chose which item they wanted to work to earn for the duration of the session. The students were reminded that they could change their mind at any time between the two highest ranked items. The session was terminated when the participant completed the activity or after 10 minutes elapsed. Three students had 10-minute sessions each time, except for the three 7 minute sessions due to unexpected schedule changes. One teacher insisted that the student complete assigned work before receiving his reinforcer. Most of these sessions were 10 minutes in length, but a few lasted up to 14 minutes. Immediately upon completion of the session, the student received the item or activity.

Teacher Training and Generalization

Teachers were trained to implement the choice intervention by the experimenter for phase "C." They were also taught how to administer the computer-based preference

assessment and administered it to the student prior to this phase. Teachers were provided with the FOI rubric and step by step directions on how to implement each element of the intervention. They then practiced on the experimenter until 100% FOI was achieved. Upon achieving mastery in implementing the intervention, teachers implemented the choice intervention with the target students. The teachers first delivered the preference assessments to the students. They then followed the same procedures as the prior intervention phases. The experimenter collected 10s partial interval and FOI data across 100% of the sessions (see FOI data above). A second independent observer collected the same data across at least 20% of generalization sessions (see IOA data above). Retraining and consultation was conducted with the teacher after any occurrence of below 100% FOI. Data were graphed and shared with the teacher throughout the intervention process.

Social validity data were also collected via teacher interview to ensure that the teacher viewed the intervention as successful and easy to implement. Teachers completed an adapted version of the Treatment Acceptability Rating Form – Revised (TARF-R; Reimers & Wacker, 1992). See Appendix E for the adapted treatment acceptability form. In order to adapt the TARF-R, relevant social validity variables were determined based on the rubric outlined in Jitendra, Burgess, & Gajria (2011). The researcher asked teachers about the acceptability, feasibility, perceived effectiveness, and likelihood of continued use of the intervention. In addition, this study aligns with relevant social validity variables outlined in the aforementioned rubric in that it was conducted in typical settings (the general education classroom), by typical intervention agents (teachers during the generalization phase), and for an extended period of time (average of 12 intervention sessions per student over about 7 weeks for most participants).

CHAPTER 4

Results

Preference Assessments

Three of the four students received three computer-based preference assessments, while the fourth (Nils) received two (see Figures 1-4 for graphical depictions of preference assessment results).

Derrel's first preference assessment (PA) indicated Little Einsteins™ YouTube videos (selected 80% of opportunities) and Subway Surfers® mobile phone game (70%) as highly preferred (HP) activities. His second PA indicated time with his teacher (100%) as his most preferred activity, and Subway Surfers™ and ST Math© tied (70%) for second most preferred. As such, a smaller preference assessment was conducted with Teacher, Subway Surfers®, and ST Math© that yielded his teacher as the most preferred and Subway Surfers® as the second most preferred. His final PA indicated time with his teacher and access to the computer (both 90%) as HP items (See Figure 1).

Alton's first PA indicated time with Peer 1 (selected 100% of opportunities) and time with Teacher 1 (90%) as highly preferred (HP) activities. His second PA indicated a fidget spinner (100%) and ice cream (80%) as HP items. Alton's final PA indicated time with Peer 5 (90%) and ice cream (80%) as HP items or activities (See Figure 2).

Jerrod's first PA indicated time with Peer 1 (selected 100% of opportunities) as his most preferred activity. Time with Teacher 1 or Takis® snacks tied (both 82%) for second most preferred. A smaller PA was conducted with Peer 1, Teacher 1, and Takis®, which yielded a hierarchy of Peer 1, then Takis®, and then Teacher 1 as most preferred items and activities. Jerrod's second PA indicated time with Peer 2 (82%) as the most

preferred activity. Peer 1, Takis®, and Spongebob Squarepants® YouTube videos were tied for second (55%). A smaller preference assessment determined that Takis® were the 2nd most preferred over Peer 1 and Spongebob®. Jerrod's final PA indicated time with Peer 2 (82%) and Pepsi® (73%) as HP items or activities (See Figure 3).

Nils only completed two preference assessments due to attrition from the study from low attendance. He did not move on to the final phase ("C") of the interventions. Nils's first PA indicated Plants vs. Zombies® mobile phone game (90%) and Hot Lays® potato chips (80%) as HP items/activities. His second PA indicated Hot Fries® snacks (80%) and Oreo® cookies (70%) as HP items (See Figure 4).

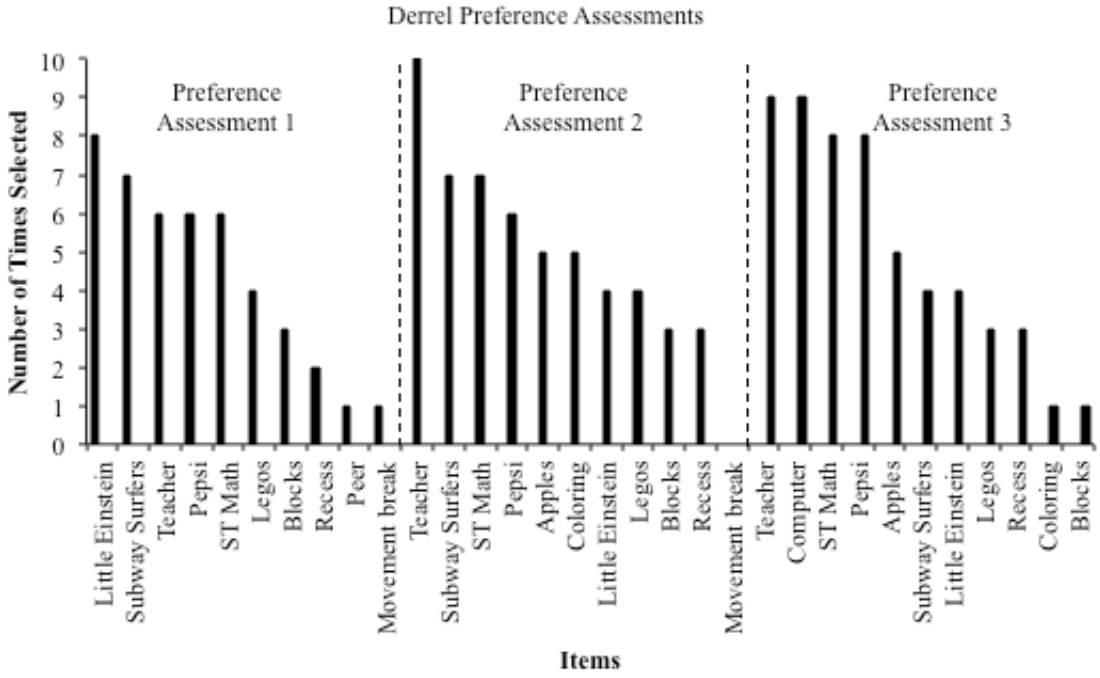

Figure 1. Derrel's preference assessment results. The items and number of times each item was selected for each preference assessment and all participants.

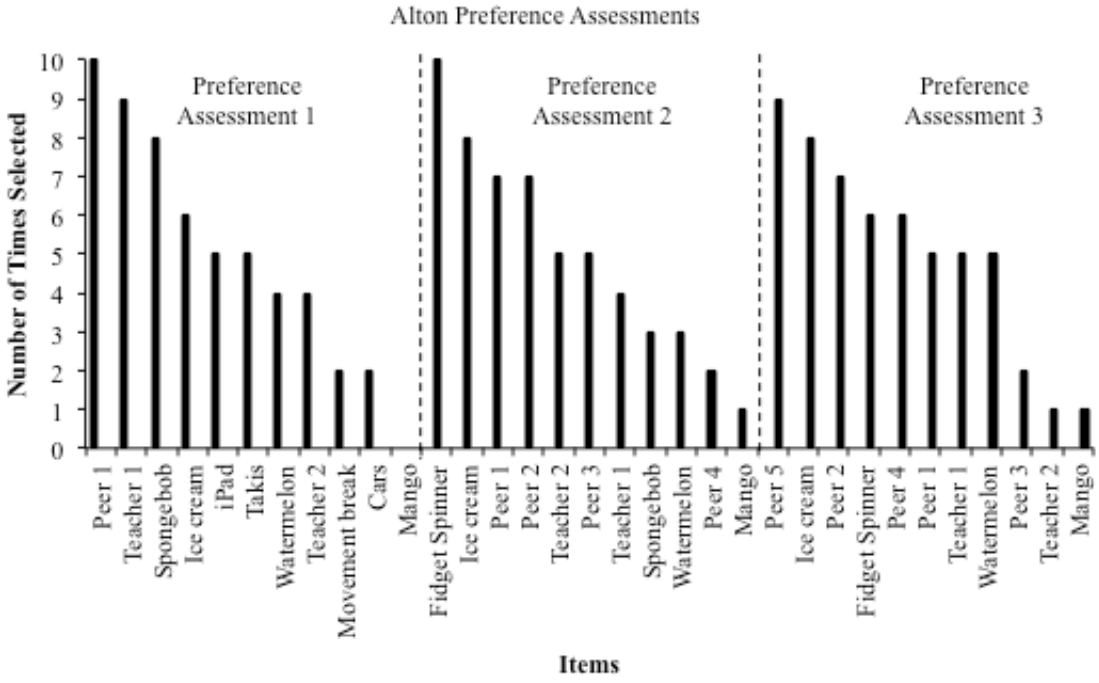

Figure 2. Alton's preference assessment results. The items and number of times each item was selected for each preference assessment and all participants.

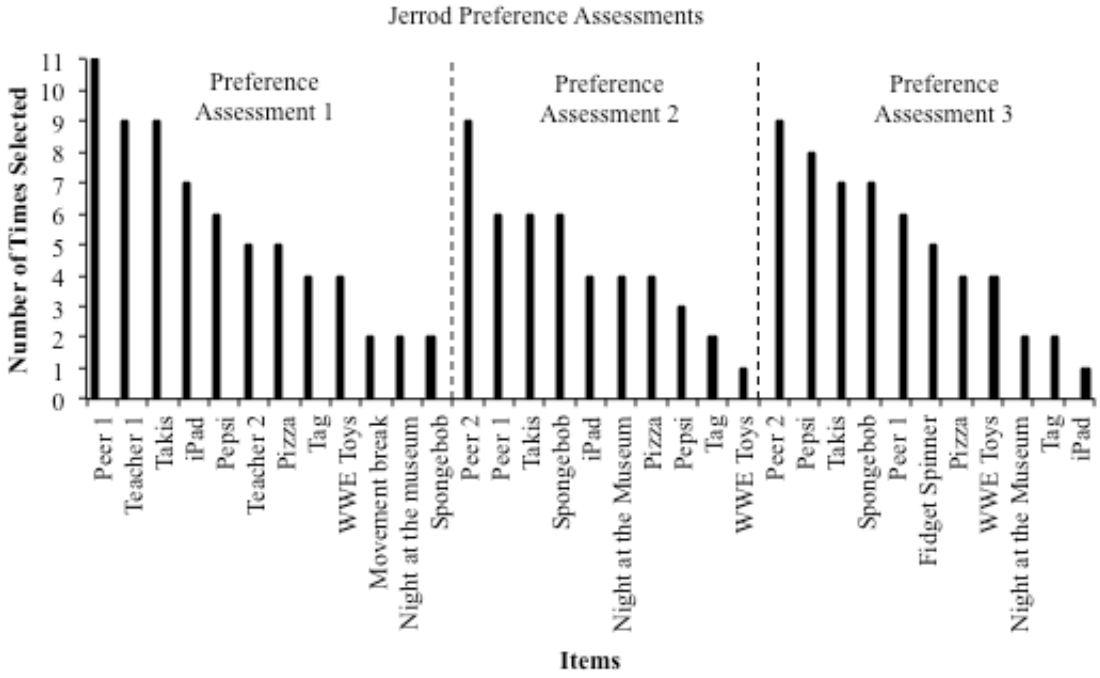

Figure 3. Jerrod's preference assessment results. The items and number of times each item was selected for each preference assessment and all participants.

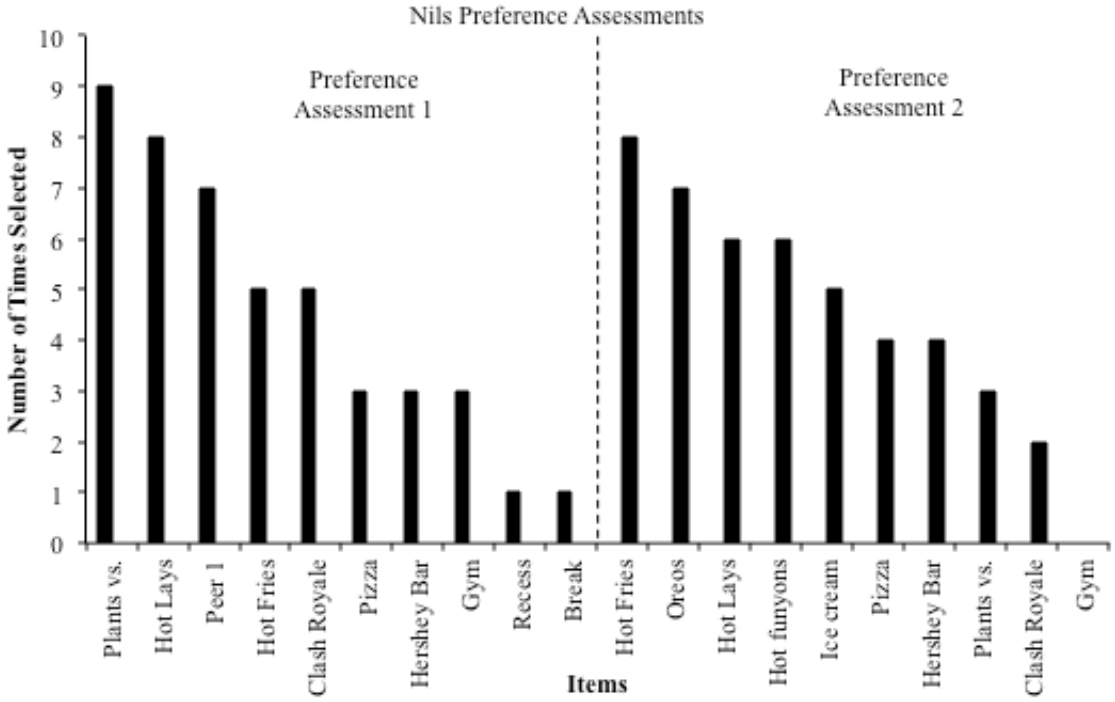

Figure 4. Nils's preference assessment results. The items and number of times each item was selected for each preference assessment and all participants.

Intervention

The question regarding whether the choice-based intervention modeled after the concurrent operant framework reduces identified target behavior and increases on-task behavior in students with behavioral difficulties was addressed through this intervention phase. In addition, the question of successful teacher implementation is addressed here through the final ("C") phase. The outcomes from the intervention phases (ABABC) for Derrel, Alton, and Jerrod are presented in Figures 5-7. The intervention data for Nils is presented in Figure 8, as his school attendance was too low to complete the intervention phases. His data are not sufficient to draw causal inference conclusions, but will be discussed as they stand. All three participants who finished each phase of the study completed the intervention (ABABC) between six and seven weeks. Nils finished in four weeks.

All participants displayed higher levels of their target behavior (referred to as challenging behavior) during the initial baseline phases with subsequent decreases when the choice-based intervention was implemented. This same pattern occurred in the second AB phase. Teachers were able to maintain the effects of the intervention in the final phase of the study for each of the three participants in that phase.

Derrel completed the full intervention sequence with a total of 13 intervention sessions and 10 baseline sessions. During the first baseline (A1) problem behavior occurred in median of 63.33% percent intervals with an accelerating trend. His challenging behavior increased from 55% of observed intervals to 78.33% of observed intervals during A1. His median percent of observed intervals of challenging behavior decreased to 16.67% during the first intervention phase (B1). Derrel showed a decreasing

trend of 16.67% of observed intervals to 11.67% of observed intervals across B1. Derrel's observed challenging behavior immediately increased to 58.3% in the second baseline (A2) phase, demonstrated an accelerating trend, and was observed to be 81.67% by the end of A2. He had a median of 80% of observed intervals with challenging behavior in A2. With the implementation of the second intervention phase (B2), Derrel demonstrated an immediate decrease in challenging behavior to 28.33% of observed intervals. Derrel showed a fairly stable trend throughout B2, but ended with 1.67% of observed intervals with challenging behavior (Median = 16.67). During the teacher led intervention phase (C), Derrel largely maintained his same observed level of challenging behavior as B2. He demonstrated a stable trend and had a median of 18.33% intervals with challenging behavior (See Figure 5 below).

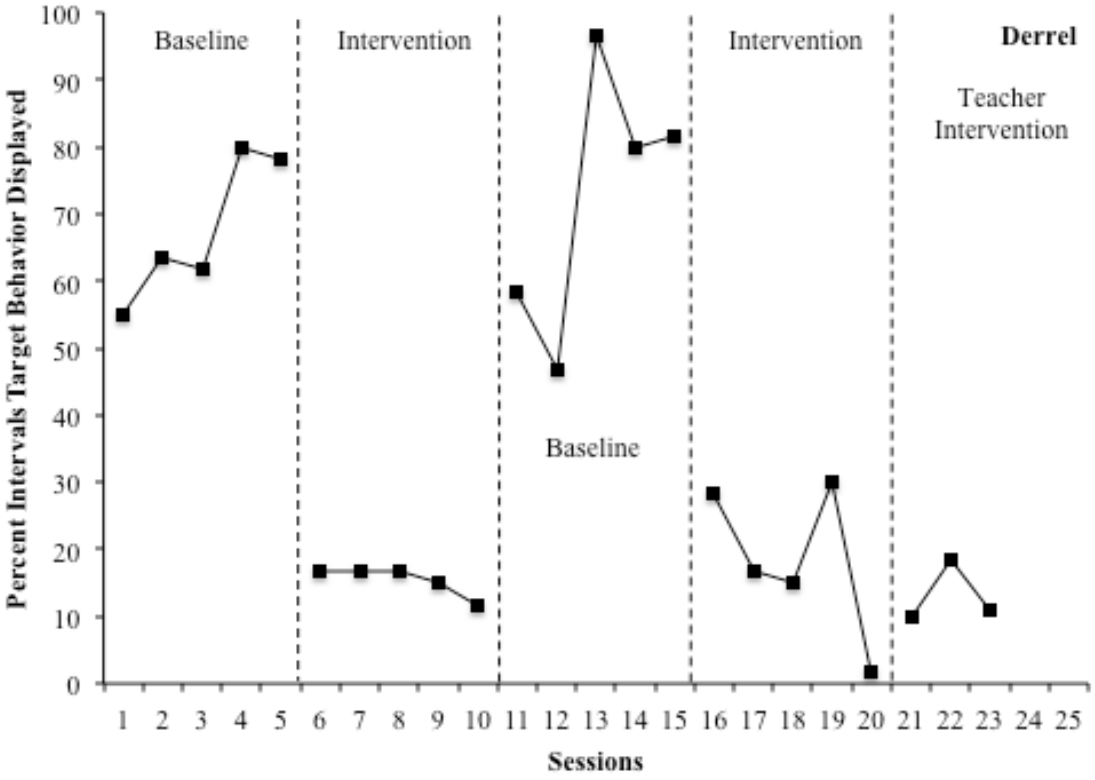

Figure 5. Derrel's intervention data. Percent of intervals of target behavior observed per session for each phase of the ABABC design.

Alton completed the full intervention sequence with a total of 13 intervention sessions and 10 baseline sessions. Alton engaged in a median of 63.34% percent intervals of challenging behavior during the first baseline (A1). Alton's trend was fairly stable, though variable (changing between 16.7 and 32% of observed intervals each observation). His median percent of observed intervals of challenging behavior decreased to 28.33% during the first intervention phase (B1). Alton showed a decreasing trend across the B1 phase, starting with 33.33% of observed intervals to ending with 13.33% of observed intervals of challenging behavior. Alton's observed challenging behavior immediately increased to 66.67% in the second baseline (A2) phase, showed an accelerating trend, and was observed to be 81.67% by the end of A2. He had a median of 73.33% of observed intervals with challenging behavior in A2. With the implementation of the second intervention phase (B2), Alton demonstrated an immediate decrease in challenging behavior to 20.00% of observed intervals. Alton showed a fairly stable trend throughout B2, but had one instance of 50% of observed intervals with challenging behavior. He ended the B2 phase with 21.67% of observed intervals with challenging behavior (Median = 21.67). During the teacher led intervention phase (C), Alton largely maintained his same observed level of challenging behavior as B2. He had a stable trend and had a median of 21.67% intervals with challenging behavior (See Figure 6 below).

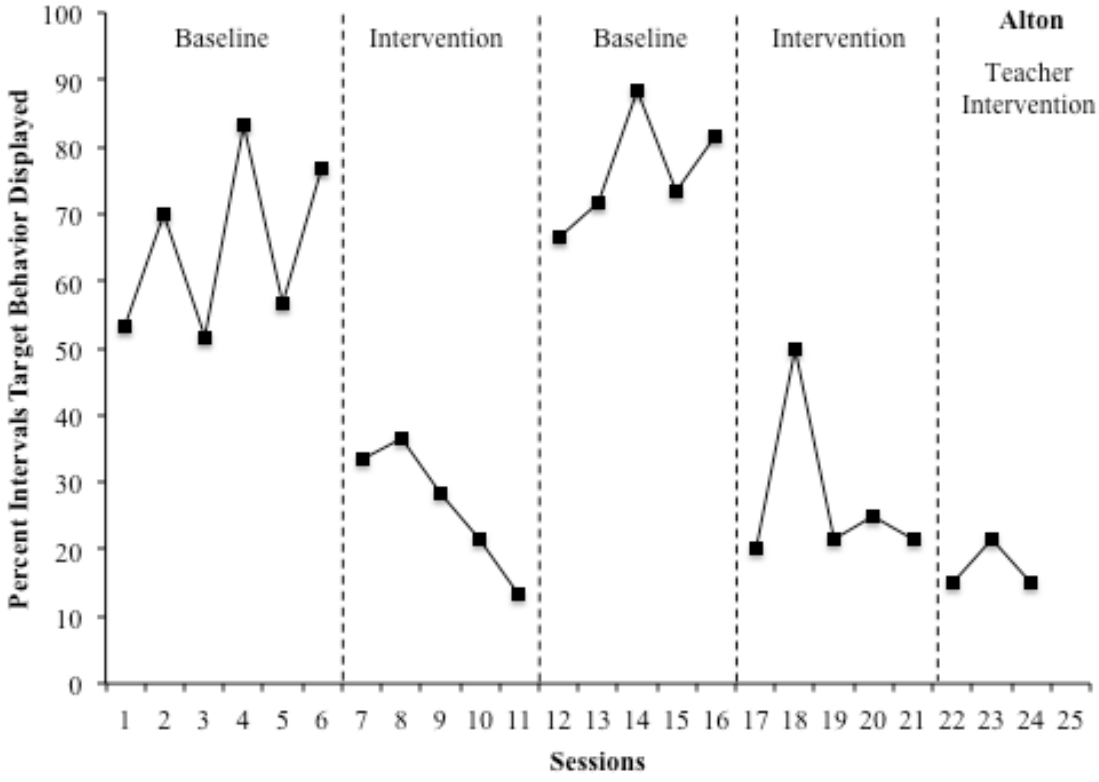

Figure 6. Alton's intervention data. Percent of intervals of target behavior observed per session for each phase of the ABABC design.

Jerrod completed the full intervention sequence with a total of 15 intervention sessions and 9 baseline sessions. Jerrod's second baseline phase was shortened to account for time constraints due to nearing the end of the school year. Jerrod engaged in an increasing trend during the first baseline (A1) starting with 55% observed intervals of challenging behavior and ending with 93.33% (median = 70%). Jerrod's observed challenging behavior dropped immediately with the introduction of the intervention (B1) to 16.67% observed intervals of challenging behavior. He showed a relatively stable trend and had a median of 13.34%. Jerrod's observed challenging behavior immediately increased to 76.67% in the second baseline (A2) phase, had an accelerating trend, and was observed to be 98.33% by the end of A2. He had a median of 73.33% of observed intervals with challenging behavior in A2. With the implementation of the second intervention phase (B2), Jerrod showed an immediate decrease in challenging behavior to 11.67% of observed intervals. He showed a fairly stable, but somewhat decreasing trend throughout B2 to 5% observed intervals of challenging behavior. His median was 8.33% in B2. During the teacher led intervention phase (C), Jerrod largely maintained his same observed level of challenging behavior as B2. He had a stable trend and had a median of 10.84% intervals with challenging behavior (See Figure 7 below).

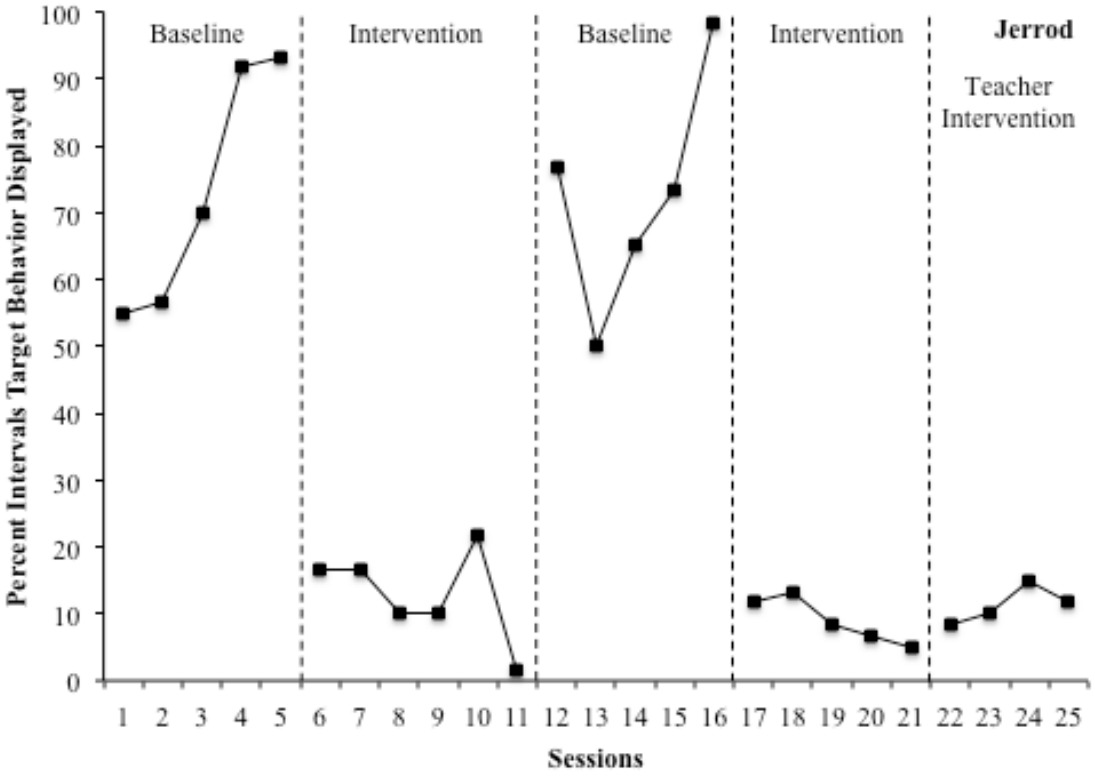

Figure 7. Jerrod's intervention data. Percent of intervals of target behavior observed per session for each phase of the ABABC design.

For each of the three participants with a final teacher-led intervention (C) phase, teachers were able to successfully implement the intervention such that challenging behavior remained at similar levels to the previous phase in which the experimenter led the intervention. All three students demonstrated a similar level to the B2 phase and stable trend in the teacher-led intervention.

Due to low attendance, Nils participated in phases ABA and part of B2 (see Figure 3). As such he did not complete the full intervention sequence, but completed 9 baseline sessions and 7 intervention sessions. Nils engaged in somewhat variable percent of observed challenging behavior during first baseline (A1) with a median of 73.33% intervals of challenging behavior. His observed challenging behavior dropped immediately with the introduction of the intervention (B1) to 35% observed intervals of challenging behavior. He showed a decreasing trend, ending the phase with 3.33% observed intervals of challenging behavior. Nils engaged in a median of 11.67% in B1. Nils showed an immediate increase in observed challenging behavior (65%) with the return to baseline (A2) and had a relatively stable, if variable, trend (Median = 69.17%). Nils had insufficient data in the second intervention phase (B2) to draw inferences. He did demonstrate an immediate decrease to 20% of observed intervals of challenging behavior. His next data point was at 6.67% observed intervals of challenging behavior. With only two data points in the final phase, inferences of experimental control cannot be and inferences of efficacy are undermined (See Figure 8 below).

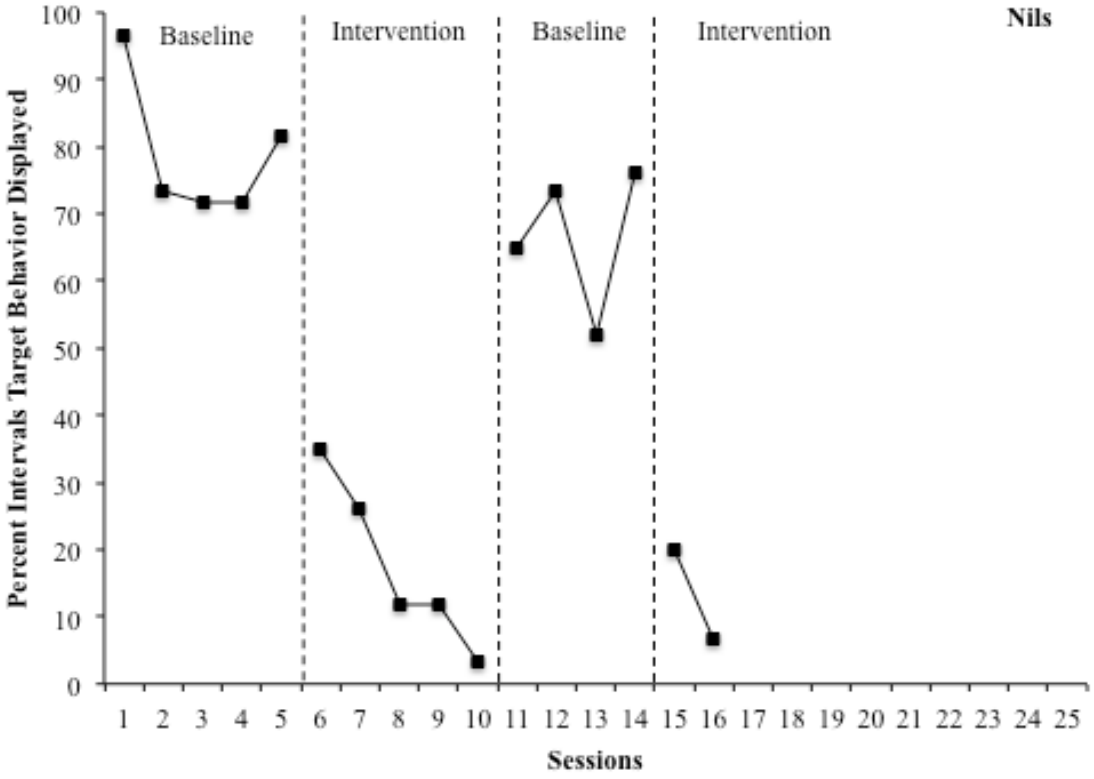

Figure 8. Nils's intervention data. Percent of intervals of target behavior observed per session for each phase of the ABAB design utilized with Nils.

Teacher Fidelity of Implementation

The question regarding whether teachers could implement the choice intervention with was addressed through the final intervention (C) phase of the ABABC design. Teachers' FOI was collected for each intervention session during the teacher-led intervention phase. Teachers were to implement four main steps to reduce the complexity of the FOI form and not require teachers to time the sessions while also teaching a class: 1) ask the student for understanding of the task, 2) present the cards with the two most preferred items from the preference assessment, 3) tell the student they could change their mind at any time between the two highest ranked items, and 4) present the reinforcer immediately following the session. Teacher fidelity ranged from 75%-100% (M = 90%). Each instance of 75% FOI involved the teacher skipping step three. Retraining was conducted prior to the next session.

Intervention Social Validity

To address teacher acceptability and social validity, teachers (N = 4) anonymously responded to an experimenter created Intervention Acceptability Form (see Appendix E). See Table 1 for summary data for the Intervention Acceptability Form. One teacher was unable to answer the Teacher-led section, thus eliminating anonymity. This teacher was advised that they could opt out of completing the form for this reason, but chose to complete it nonetheless. As such, the experimenter did not access the data until after the school year finished.

Table 1
Teacher Social Validity Ratings

Teacher	Acceptable		Effective		Feasible		Reduce Problem Behaviors		Increase Work Completion		Continue to use
	EI	TI	EI	TI	EI	TI	EI	TI	EI	TI	TI Only
1	4	4	4	4	2	4	4	4	4	4	3
2	4	4	3	2	4	4	2	2	4	4	4
3	4	4	3	3	2	2	3	3	4	4	3
4	3		3		2		3		3		
Mean	3.75	4	3.25	3	2.5	3.33	3	3	3.75	4	3.33

Note. This table presents the individual and mean scores as reported by the four teachers in this study. Teacher ratings of experimenter led interventions (EI) and teacher led interventions (TI) are displayed separately.

The most relevant social validity variables are: 1) social importance of the dependent variable (DV); 2) magnitude of change in the DV; 3) practical and cost effective intervention implementation such that it is acceptable, feasible, effective, and will continue to be used; 4) and the degree to which the intervention is implemented by typical intervention agents in typical settings for an extended period of time (Jitendra, Burgess, & Gajria, 2011). The social validity questionnaire addressed acceptability, effectiveness (perceived), feasibility, and continued use. The other variables were addressed in other elements of the study and will be examined in the Discussion section.

Teachers rated the acceptability, feasibility, and probable continued use on a 4-point Likert scale (1= strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree). They rated most items based on the experimenter-led intervention (EI) and then based on the teacher-led intervention (TI). The EI acceptability ratings ranged from 3-4 (M = 3.75), and TI acceptability ratings were 4. The EI feasibility ratings ranged from 2-4 (M = 2.5), while the TI feasibility ratings 2-4 (M = 3.33). The EI effectiveness ratings ranged 3-4 (M = 3.25), and the TI effectiveness ratings ranged from 2-4 (M = 3). Teachers' ratings of whether they planned to continue to use this intervention with the target student ranged from 3-4 (M = 3.33).

Teachers also rated that they generally agreed or strongly agreed that intervention helped reduce problem behavior during sessions (EI range 2-4, M = 3; TI range 2-4, M = 3) and increase work completion (EI range 3-4, M = 3.75; TI M = 4) both during the experimenter-led and teacher-led phases. One teacher rated that she disagreed that it reduced problem behavior but strongly agreed that it increased work completion.

CHAPTER 5

Discussion

The purpose of this study was to implement a systematic choice-based intervention in the classroom with students referred for behavioral difficulties and at-risk for exclusion from general education. This study addressed important gaps in the literature by following rigorous single case design guidelines. The present research implemented a preventative approach to behavioral interventions within existing intervention systems in a school. This study was also informed by the concurrent operant framework, applied this theory in a naturalistic setting for children, and expanded the participants to include individuals without identified disabilities. Finally, the present research expanded the intervention agents of the intervention to teachers. The results of this study provide further support to the existing literature for the use of the concurrent operant framework as a model for a choice-based intervention for individuals with challenging behaviors. In addition to replicating some elements of previous work, this study applied the theory of the concurrent operant framework in general education classrooms with children without identified disabilities.

Research Question 1. **To what extent does the choice based intervention modeled after the concurrent operant framework reduce identified target behaviors and increase on-task behavior in students with behavioral difficulties?**

This study first sought to determine if the concurrent operant framework could be used as a model to create a choice-based intervention to reduce target behaviors and increase on-task behavior in students in general education classrooms with behavioral difficulties. Three students completed sufficient intervention sessions across phases to

demonstrate experimental control. Prior to phase changes, each student had a stable or accelerating baseline, such that target behaviors stayed relatively the same or were increasing. In each phase change from baseline to intervention (and vice versa) there was a large, immediate level change that remained relatively stable. The participants generally showed high levels of target behaviors during baseline phases and low levels of target behaviors during intervention phases. As target and on-task behavior were mutually exclusive, low levels of target behaviors in intervention phases indicated high levels of on-task behavior. These immediate, large, stable changes in behavior across multiple students and multiple phases allow for an inference of experimental control. The choice intervention reduced target behaviors and increased on-task behaviors for all three participants that completed the intervention. The fourth participant had a similar trend across three study phases, but did not have enough data in the second intervention phase (the fourth overall phase) to show experimental control.

These results are in line with previous research that utilized the concurrent operant framework as an intervention. A previous review of concurrent operant intervention studies conducted by the author (Simonson, 2016) as well as two other literature reviews (Canella et al., 2005; Tullis et al., 2011) all found mostly or entirely positive results for choice based interventions. Canella and colleagues (2005) cautioned that, at that time, that there was not enough data to suggest choice would be effective at all times for all individuals. Tullis and colleagues (2011) determined that choice-based interventions could be viewed as an evidence-based intervention for individuals with severe disabilities. The results of the review by Simonson (2016) expanded the interpretation from the previous reviews such that the choice intervention based on the

concurrent operant framework was an effective intervention for a wider range of disabilities within the school setting. The present research coincides with these reviews in that the intervention modeled after the concurrent operant framework was effective. It also expands on this work by demonstrating the efficacy of the concurrent operant theory in the general education setting with individuals with high behavioral needs but no identified disabilities.

Research Question 2. To what extent were teachers able to implement this intervention with fidelity?

The present research next sought to expand the interventionists to include teachers in the general education setting. This question addressed whether teachers were able to implement the intervention with fidelity. Single subject design standards (Horner et al., 2005; Jitendra et al., 2011) evaluate research on the use of typical intervention agents in typical settings. If this intervention based on the concurrent operant framework is going to have utility in the general education setting, teachers must be able to implement the intervention with sufficient fidelity to demonstrate treatment efficacy. Teachers represent the most common intervention agents for a variety of interventions and accommodations in the general education setting (Han & Weiss, 2005). Having teachers utilize the concurrent operant framework in general education both saves resources and adds a positive, preventative strategy to teachers' repertoire of strategies.

Teachers were rated on fidelity of implementation and the dependent variable was measured in the same way for the participants. Teachers implemented four main steps to reduce the complexity of the FOI form and not require teachers to time the sessions while also teaching a class. These steps were: 1) ask the student for understanding of the task,

2) present the cards with the two most preferred items from the preference assessment, 3) tell the student they could change their mind at any time between the two highest ranked items, and 4) present the reinforcer immediately following the session. Teacher fidelity ranged from 75%-100% with an average of 90%. Each instance of 75% FOI involved the teacher skipping step three.

Teachers generally implemented the intervention with fidelity, but had some difficulty reminding the student they could change their mind about their selection at any time. Since the intervention effect stayed consistent and stable, one can reasonably infer that this difficulty with fidelity did not impact the efficacy of the intervention or, perhaps, that step three was not a necessary component of the intervention. Qualitatively, the participants very rarely changed their selection in the middle of or after the intervention across all phases of the study.

Research Question 3. To what extent was implementation by teachers successful, such that levels of target behaviors remained at similar levels as during the intervention by the author?

Not only did this research evaluate if teachers could implement the intervention with fidelity, but it also sought to determine if teacher implementation was successful such that behaviors remained at the low levels attained in the previous intervention phases. Thus, the purpose of this intervention phase was not for the teacher to correctly return to baseline and subsequently reestablish experimental control, but to maintain the effects of the intervention and implement it with fidelity. For each of the three participants in this phase, and their three teachers, the level of problem behavior remained at generally the same level as in the previous intervention phase, showed a

stable trend, and had no overlap with previous baseline phases. As such, teacher implementation of the intervention was successful in keeping target behaviors low and on-task behaviors high. Teacher implementation of interventions is a key to scaling up interventions for wider applicability within the schools (Han & Weiss, 2005). Successful implementation of effective interventions in the general education classroom can lead to class wide implementation and wider generalization of skills (Han & Weiss, 2005).

Research Question 4. To what extent does this intervention meet social validity criteria such that teachers find it acceptable and feasible?

Finally, this study sought to examine a variety of social validity variables outlined by Jitendra and colleagues (2011) based on the standards of single case design described by Horner and colleagues (2005). The target of this question was whether teachers felt that the intervention effective, feasible, and acceptable. Other data relevant to the aforementioned social validity variables will also be presented. When both the teacher and the experimenter led the intervention, teachers generally found the intervention to be effective, feasible, and acceptable. Interestingly, the teachers found the intervention to be qualitatively less feasible when the experimenter led the intervention than when the teacher led it. One hypothesis for this somewhat counter-intuitive finding is that even though the teacher led intervention resulted in more work for the teacher, they felt a sense of self-efficacy leading the intervention. Thus, the intervention felt more feasible because they were then responsible for the effects and had a new tool to use with challenging behaviors.

Teachers also mostly agreed that the intervention reduced the problem behavior and strongly agreed that it increased work completion of the participant. From the

experimenter's definitions, problem behavior and work completion were mutually exclusive. The participant could not be rated as on task when engaging in problem behavior and vice versa. As such, any occurrence of *not* being rated off-task indicates that the student was on-task. Thus, on- and off-task behavior sum to 100% of the observed intervals. Teachers found the work completion aspect of the intervention to be more agreeable, however. This is a somewhat challenging finding to explain other than the teacher saw an increased number of classroom work artifacts (worksheets, tests, etc.) from the target student that would be easier to mentally track than occurrences of behavior. As such, teachers may find on-task behavior or work completion a more meaningful indication of levels of target behavior.

Finally, all teachers agreed or strongly agreed that they would continue to use this intervention or the choice-based elements of it. This final aspect of social validity is encouraging such that these teachers were taught an extra evidence-based intervention to keep in their proverbial toolkit to utilize with difficult students. The teachers also have evidence that students will respond well to this intervention and may make them less likely to refer students to problem solving teams or encourage special education evaluations.

As an addendum, the author followed-up with the school psychologist at participants' school about one year later to determine if they had been referred for special education. At that time, zero of the four students had been referred for special education to the best knowledge of the school psychologist. Two students left the school, but were doing well prior to transferring. Each of the four students had continued behavior

interventions, including elements of choice. Thus, it appears that the four participants continue to respond to behavioral antecedent interventions.

The results of the present research have implications for broadening the repertoire of evidence-based interventions available to school based and psychological practitioners, as well as teachers. In addition to providing further evidence for the concurrent operant framework, this study expands a choice based intervention into the schools and with teachers as interventionists. Demonstrating these effects in a typical setting for children helps move this body of research out of self-contained settings and into integrated classrooms. In addition, this provided preliminary evidence for use of a choice-based intervention modeled after the concurrent operant framework for people without identified disabilities with highly problematic behavior. Each of these elements demonstrated the efficacy of the concurrent operant framework in more naturalistic settings, with more typically encountered adults (teachers instead of researchers), with a larger segment of the population (those without identified behavioral disabilities). These factors demonstrate that choice can be a powerful tool for different groups of children than are usually included in this body of research.

Most behavioral interventions tend to be prescriptive and offer relatively few choices. As discussed previously, choice may be reinforcing in itself (Fisher et al., 1997). Regardless, offering choice enhances self-direction and dignity of individuals with and without disabilities. Our ethical call as psychologists and school-based practitioners behooves us to enhance the rights and dignity of all persons (American Psychological Association, Ethical Principle E; 1992; National Association of School Psychologists

Ethical and Professional Practices IV.2.2, 2010). As such, implementing choice, when possible, is ethically defensible and evidence based.

The present study is also in line with most of the previous research in this area (see Cannella et al., 2005; Simonson, 2016; Tullis et al., 2011 for more in depth discussions on this body of literature) such that primarily positive results were demonstrated. The choice intervention clearly reduced problem behaviors for three of the four participants in this study. The fourth participant did not have enough data due to attrition to make a causal inference. Each phase change in the study demonstrated a clear change in level of problem behavior for each participant. The drastic reduction in problem behavior, and coinciding increase in work completion, provides evidence for this being a socially important dependent variable and magnitude of change; two key elements of social validity (Jitendra, Burgess, & Gajria, 2011).

In addition to efficacy, the present intervention mirrored the experience of general education as closely as possible such that all intervention sessions occurred within the participant's general education classroom during primary instructional periods. Nearly all sessions were conducted at the student's desk and the final phase of the study had a typical intervention agent (the teacher) implementing the intervention. The intervention also occurred over an extended period of time for each participant, thus meeting criteria for three additional social validity variables outlined by Jitendra and colleagues (2011).

Limitations

This research had several potential limitations that should be noted. First, only three participants completed the study. While this is more than sufficient based on the What Works Clearinghouse standards (Kratochwill et al., 2010), a larger, more diverse

sample will only enhance external validity arguments and bolster the evidence base for the utility of interventions modeled after the concurrent operant framework. In addition, there were a few times when intervention sessions had to be shortened due to unavoidable issues in schools (fire drills, change of schedule, etc.). Similarly, some phases had to be shortened to three or four sessions per phase due to time constraints such as the end of the school year approaching. One teacher occasionally asked the examiner to pull a participant aside rather than start the intervention at his desk.

These small methodological changes may be unavoidable outside of more controlled clinic or laboratory settings. They also did not seem negatively impact the data. That being said, keeping as many variables as possible consistent allows for stronger causal inferences and external validity arguments. A counter point, however, is that even with unavoidable disruptions to the control of extraneous variables that exist in natural settings, this choice-based intervention still demonstrated large changes in for each of the three participants. Thus, one could make an argument that the intervention was powerful enough to overcome these limitations. A final limitation is that there are potential issues with the long-term feasibility of teachers running the students' preference assessments. The primary author built the preference assessment system on Qualtrics for teachers. This meant that for the purpose of this study, teachers only had to press a "start" button. In the future, teachers would have to take the time to build preference assessments.

This study also sets the stage for several possible areas of future research. The concurrent operant framework has relatively little implementation in the general education setting, with individuals without identified disabilities, and with teachers as

interventionists. Each of these elements would benefit from replication with different samples of individuals with more diversified behavioral needs in other parts of the country. Importantly, this research was based on the concurrent operant theory and implemented an intervention package with more than one step (i.e., check for understanding, present choices, instruct that student could change their mind, provide reinforcer). There is opportunity for each of these elements to be systematically evaluated. Another potential future direction would put teachers as the interventionist for the duration of an ABAB design. This would demonstrate that teachers could act as interventionists to not just maintain intervention effects, but to gain experimental control. Further implementation of the concurrent operant framework should follow the single case design standards from Horner and colleagues (2005) and consider utilizing the rubric described by Jitendra and colleagues (2011). Another potential direction would be to replicate this study but remove the procedural step of telling the participant they can change their reinforcer selection at any time. Qualitatively, few participants changed their mind during or after an intervention session. In addition, there did not appear to be an impact on the data when teachers omitted this step in the final intervention phase. Systematically evaluating whether this step is necessary is warranted and could reduce the overall complexity of the intervention. In addition, a preference assessment tablet or phone application would facilitate teachers' use of the preference assessment process and help overcome long-term feasibility issues. Finally, the present research did not have a set criterion for percent of intervals of problem behavior in which a student would *not* earn the reinforcer during intervention phases. All students responded strongly to the intervention, but this should be examined in future research and considered a priori.

Conclusion

The purpose of this research was to pull together the strands of ethical guidelines, legal mandates for evidence based practice, and existing behavioral interventions with the conceptual areas of choice, self-determination, and person-centered thinking. This research also aspired to apply a high level of methodological rigor by applying the quality indicators for single subject research from Jitendra and colleagues (2011) adapted from Horner and colleagues (2005). Finally, this research sought to enhance the evidence base for the use of the concurrent operant framework as a behavioral intervention while expanding the framework into the general education classroom with teachers as interventionists. The theory of concurrent operants presents practitioners with an opportunity to implement an evidence-based intervention in such a way that enhances choice and self-determination for the individuals they serve.

References

American Psychological Association. (1992). Ethical principles of psychologists and code of conduct. American Psychologist, 47, 1597-1611.

Berg, W. K., Wacker, D. P., Cigrand, K., Merkle, S., Wade, J., Henry, K., & Wang, Y. C. (2007). Comparing functional analysis and paired-choice assessment results in classroom settings. *Journal of Applied Behavior Analysis*, *40*, 545-552.

Bourret, J. C., Iwata, B. A., Harper, J. M., & North, S. T. (2012). Elimination of position-biased responding in individuals with autism and intellectual disabilities. *Journal of Applied Behavior Analysis*, *45*, 241-250.

Bowman, L. G., Piazza, C. C., Fisher, W. W., Hagopian, L. P., & Kogan, J. S. (1997). Assessment of preference for varied versus constant reinforcers. *Journal of Applied Behavior Analysis*, *30*, 451-458.

Cannella, H. I., O'Reilly, M. F., & Lancioni, G. E. (2005). Choice and preference assessment research with people with severe to profound developmental disabilities: A review of the literature. *Research in Developmental Disabilities*, *26*, 1-15.

DeLeon, I. G., Fisher, W. W., Rodriguez-Catter, V., Maglieri, K., Herman, K., & Marhefka, J. M. (2001). Examination of relative reinforcement effects of stimuli identified through pretreatment and daily brief preference assessments. *Journal of Applied Behavior Analysis*, *34*, 463-473.

Dozier, C. L., Vollmer, T. R., Borrero, J. C., Borrero, C. S., Rapp, J. T., Bourret, J., & Gutierrez, A. (2007). Assessment of preference for behavioral treatment versus baseline conditions. *Behavioral Interventions*, *22*(3), 245-261.

Dunn, L. M. (1968). Special education for the mildly mentally retarded: Is much of it justifiable? *Exceptional Children, 35*(1), 5-22.

Every Child Succeeds Act (Pub. L. No. 114-95).

Finkel, A. S., Derby, K. M., Weber, K. P., & McLaughlin, T. F. (2003). Use of choice to identify behavioral function following an inconclusive brief functional analysis. *Journal of Positive Behavior Interventions*, *5*(2), 112-121.

Fisher, W. W. & Mazur, J. E. (1997). Basic and applied research on choice responding. *Journal of Applied Behavior Analysis*, *30*, 387-410.

Fisher, W. W., Piazza, C. C., Bowman, L. G., & Amari, A. (1996). Integrating caregiver report with systematic choice assessment to enhance reinforcer identification. *American Journal of Mental Retardation: AJMR*, *101*(1), 15-25.

Fisher, W., Piazza, C. C., Bowman, L. G., Hagopian, L. P., Owens, J. C., & Slevin, I. (1992). A comparison of two approaches for identifying reinforcers for persons with severe and profound disabilities. *Journal of Applied Behavior Analysis*, *25*, 491-498.

Fisher, W. W., Thompson, R. H., Piazza, C. C., Crosland, K., & Gotjen, D. (1997). On the relative reinforcing effects of choice and differential consequences. *Journal of Applied Behavior Analysis*, *30*, 423-438.

Geckeler, A. S., Libby, M. E., Graff, R. B., & Ahearn, W. H. (2000). Effects of reinforcer choice measured in single-operant and concurrent-schedule procedures. *Journal of Applied Behavior Analysis*, *33*, 347-351.

Guess, D., Benson, H., Siegel-Causey, E., & Agran, M. (2008). Concepts and Issues Related to Choice Making and Autonomy among Persons with Severe

Disabilities. *Research and Practice for Persons with Severe Disabilities, 33*(1-2), 75-81.

Han, S. S., & Weiss, B. (2005). Sustainability of teacher implementation of school-based mental health programs. *Journal of abnormal child psychology*, *33*(6), 665-679.

Harding, J. W., Wacker, D. P., Berg, W. K., Cooper, L. J., Asmus, J., Mlela, K., & Muller, J. (1999). An analysis of choice making in the assessment of young children with severe behavior problems. *Journal of Applied Behavior Analysis*, *32*, 63-82.

Horner, R. H., Carr, E. G., Halle, J., McGee, G., Odom, S., & Wolery, M. (2005). The use of single-subject research to identify evidence-based practice in special education. *Exceptional Children*, *71*, 165-179.

Houghton, J., Bronicki, G. B., & Guess, D. (1987). Opportunities to express preferences and make choices among students with severe disabilities in classroom settings. *Journal of the Association for Persons with Severe Handicaps*, *12*(1), 18-27.

Howard, P. (2004). The Least Restrictive Environment: How to tell?. *Journal of Law & Education*, *33*(2), 167-180.

Individuals with Disabilities Education Act of 1990 (Pub. L. No. 101-476), 20 U.S.C. Chapter 33. Amended by Pub. L. No. 105-117 in June 1997. Amended by the Individuals with Disabilities Education Improvement Act of 2004 (Pub. L. No. 108-446) in December 2004, 20 U.S.C. §§ 1400 et seq.

Jitendra, A. K., Burgess, C., & Gajria, M. (2011). Cognitive strategy instruction for improving expository text comprehension of students with learning disabilities:

The quality of evidence. *Exceptional Children*, *77*, 135-159.

Kratochwill, T. R., Hitchcock, J., Horner, R. H., Levin, J. R., Odom, S. L., Rindskopf, D. M., & Shadish, W. R. (2010). Single-case designs technical documentation. *What Works Clearinghouse*.

Lerman, D. C., Iwata, B. A., Rainville, B., Adelinis, J. D., Crosland, K., & Kogan, J. (1997). Effects of reinforcement choice on task responding in individuals with developmental disabilities. *Journal of Applied Behavior Analysis*, *30*, 411-422.

Martin, T. L., Yu, C. T., Martin, G. L., & Fazzio, D. (2006). On choice, preference, and preference for choice. *The Behavior Analyst Today*, *7*, 234.

National Association of School Psychologists. (2010). Standards for school psychology: Ethical and professional practices for school psychologists. Bethesda, MD: Author.

Osborne, A. G., & Dimattia, P. (1994). The IDEA's least restrictive environment mandate: Legal implications. *Exceptional Children*.

Piazza, C. C., Fisher, W. W., Hagopian, L. P., Bowman, L. G., & Toole, L. (1996). Using a choice assessment to predict reinforcer effectiveness. *Journal of Applied Behavior Analysis*, *29*(1), 1-9.

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Rea, P. J., McLaughlin, V. L., & Walther-Thomas, C. (2002). Outcomes for students with learning disabilities in inclusive and pullout programs. *Exceptional Children*, *68*(2), 203-223.

Reimers, T. M., & Wacker, D. P. (1992). Acceptability of behavioral treatments for children: Analog and naturalistic evaluation by parents. *School Psychology Review*, *21*(4), 628.

Roane, H. S., Vollmer, T. R., Ringdahl, J. E., & Marcus, B. A. (1998). Evaluation of a brief stimulus preference assessment. *Journal of Applied Behavior Analysis*, *31*, 605-620.

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American psychologist*, *55*(1), 68.

Simonson, G. R. (2016). *Systematic review of school-based applications of concurrent operant frameworks*. Unpublished manuscript, Department of Educational Psychology, University of Minnesota, Minneapolis, Minnesota.

Skinner, B. F. (1988). The operant side of behavior therapy. *Journal of Behavior Therapy and Experimental Psychiatry*, *19*(3), 171-179.

Tiger, J. H., Toussaint, K. A., & Roath, C. T. (2010). An evaluation of the value of choice-making opportunities in single-operant arrangements: Simple fixed- and progressive-ratio schedules. *Journal of Applied Behavior Analysis*, *43*, 519-524.

Tullis, C. A., Cannella-Malone, H. I., Basbigill, A. R., Yeager, A., Fleming, C. V., Payne, D., & Wu, P. F. (2011). Review of the choice and preference assessment literature

for individuals with severe to profound disabilities. *Education and Training in Autism and Developmental Disabilities*, *46*(4), 576-595.

Turnbull, H. R. (2005). Individuals with Disabilities Education Act reauthorization: Accountability and personal responsibility. *Remedial and Special Education*, *26*(6), 320-326.

U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, What Works Clearinghouse.

Wagner, M. (1991). Youth with disabilities: How are they doing? The first comprehensive report from the National Longitudinal Transition Study of Special Education Students.

Wehmeyer, M., & Schwartz, M. (1997). Self-determination and positive adult outcomes: A follow-up study of youth with mental retardation or learning disabilities. *Exceptional Children*, *63*(2), 245-255.

Appendix A

The Effects and Generalization of a Concurrent Operant Intervention with Highly Preferred Items on Student Off-Task Behavior Consent Form

Your child is invited to be in a research study of a behavioral intervention in which students make choices during the course of a typical school day. Your child was selected as a participant because of some difficulties they were having in their class. We ask that you read this form and ask any questions you may have before agreeing to be in the study.

This study is being conducted by: Gregory Simonson of the University of Minnesota.

Background Information

The purpose of this study is to examine the effects of a choice-based procedure in which the student chooses between highly preferred items. Specifically, we wanted to examine if off-task behavior reduces with choices. The use of a choice procedure was hypothesized to reduce off-task and problematic behavior in a classroom setting. Choice interventions allow the opportunity for students to make choices and to reduce problem behavior.

Procedures:

If you agree to your child being in this study, your child will not need to do anything more than the typical work assigned to them in the classroom. All intervention sessions will be completed during the course of the regular school day within their classroom. Your child will be able to make choices within regular instructional periods to help enhance on-task behavior. All results are completely anonymous.

Risks and Benefits of being in the Study

The study has few identified risks: Your child may have become frustrated at some point during this study. We will intervene during academic work times, which can be frustrating for many students. We do not expect your child to do anything outside of the norm in their class and for their academic tasks. In addition, before starting any choice procedures, your child will be asked if he or she would like to participate.

There are several potential benefits to participation in this study. A reduction in problematic behavior and increase in work completion will directly benefit both your child and her/his teacher. By working in classrooms to reduce problem behaviors and increase adaptive behaviors, fewer students may be referred to behavioral teams and special education. In addition, students that demonstrate fewer problematic behaviors generally function better socially. Your child may also see an increase in work completion.

Compensation:

Upon completing the academic work that the teacher assigned, your child will receive access to the highly preferred item/activity that they chose.

Confidentiality:

There are no records from this study with any names attached. Direct observation data will be collected with random identification numbers that cannot be tied back to your child. These records are kept private. In any sort of report we might publish, we will not include any information that will make it possible to identify a student. Observation records are stored securely and only researchers have access to the records. Study data will be encrypted according to current University policy for protection of confidentiality.

Voluntary Nature of the Study:

Participation in this study is voluntary. Your decision whether or not to participate will not affect your current or future relations with the University of Minnesota. If you decide to participate, you are free to not consent or withdraw at any time without affecting those relationships.

Contacts and Questions:

The researcher conducting this study is: Gregory Simonson. You may ask any questions you have now. If you have questions later, **you are encouraged** to contact me at 701-793-7085 or gsimonso@umn.edu.

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher(s), **you are encouraged** to contact the Research Subjects' Advocate Line, D528 Mayo, 420 Delaware St. Southeast, Minneapolis, Minnesota 55455; (612) 625-1650.

You will be given a copy of this information to keep for your records.

Statement of Consent:

I have read the above information. I have asked questions and have received answers. I consent to participate in the study.

Signature of parent or guardian:_____ Date: _____
(If minors are involved)

Signature of Investigator:_____ Date: _____

Appendix B

Assent Form

We are asking if you are willing to be in a program to help students be more successful in the classroom. We are trying to learn more about helping students your age be successful. Some kids need some extra help in the classroom and that is ok. We want to find new ways to help kids stay on task and be successful in the classroom but we won't know if it works until we try it.

If you agree to be in this study, I will ask you to choose between things that you like and work for them in your classroom. You will only do the work your teacher has already assigned, nothing more than other kids. You can then earn something you like by completing your work. We will do these activities for 10 minutes at a time up to 4 days per week. We will work together for about 4 weeks, but maybe as long as 6 weeks.

You might not like to do the work, and I cannot force you to do it. If you do what your teacher assigns you, you can earn the item or activity you like.

Nothing bad will happen if you say no to being in this study. You will still have your same teacher and the same work assigned to you. If you change your mind during the study, you can always stop at any time. Being in this study is totally up to you, and no one will be mad at you if you don't want to do it.

You can ask any questions that you have about this study. If you have a question later that you didn't think of now, you can ask me next time.

Signing here means that you have read this paper or had it read to you and that you are willing to be in this study. If you don't want to be in this study, don't sign. Remember, being in this study is up to you, and no one will be mad at you if you don't sign this or even if you change your mind later.

Signature of participant_____

Signature of person explaining study_____

Date_____

Appendix C

Potential Reinforcer Assessment Interview

Student's Name: Reporter: Date:_____

- Student's favorite things? This can be food (snacks, drinks, candy, sweets), games, items/toys, people in the building, specific classes, etc. What do they choose during choice time?

- Any favorite sensory activities/needs? (Fidget, toys, sounds/music, texture/contact with something)

- Favorite media/games? Computer games, iPad time, TV shows, movie, video game, board games

- Motivated by anything in particular? Food/snacks, stickers, points, a timer, bones, specific sports/games, special jobs (helper), 1:1 attention with someone, praise from teacher, time with a specific friend

Appendix D

Concurrent Operant Intervention Fidelity of Implementation Checklist

Intervention Steps	**Experimenter Completed Step (check if yes)**
1) Student asked for understanding of their assignment/task	
1a) If the student did not understand the task, the student was instructed to raise their hand and ask their teacher for clarification	*Check only if necessary*
2) The two most preferred items or pictures of activities from the preference assessment were placed on the student's desk or table approximately 25 cm apart and 25 cm in front of the student	
3) The experimenter asked student to select which item they would like to receive upon completing the session.	
4) The experimenter told the student they could change their selection at any time throughout the session.	
5) The experimenter recorded target behavior utilizing 10s partial intervals for the duration of the session (**10 minutes**)	
6) The session was terminated after the predetermined time period or after predetermined amount of work completion	
7) Examiner delivered reinforcer to student immediately upon completion of intervention session	
Total Percent Fidelity of Implementation	

Appendix E

Intervention Acceptability Rating Form

Please fill out this brief survey regarding the intervention the experimenter ran with a student in your classroom. Try to consider only the 10 minute intervention sessions when answering the following questions.

Answer the following questions regarding when the **experimenter** was in your class running intervention sessions:

	Strongly Disagree	Disagree	Agree	Strongly Agree
This intervention was acceptable (e.g., useful, correctly targeted).	1	2	3	4
This intervention was effective when the experimenter was running intervention sessions.	1	2	3	4
This intervention seemed feasible to implement.	1	2	3	4
This intervention helped reduce problem behaviors from my student during intervention sessions.	1	2	3	4
This intervention helped increase work completion of my student during intervention sessions.	1	2	3	4

Please answer these questions based on the intervention sessions that **you** ran with the experimenter's support:

	Strongly Disagree	Disagree	Agree	Strongly Agree
This intervention was acceptable (e.g., useful, correctly targeted, easy to implement).	1	2	3	4
This intervention was effective when I was running intervention sessions.	1	2	3	4
This intervention seemed feasible to implement.	1	2	3	4
This intervention helped reduce problem behaviors from my student during intervention sessions.	1	2	3	4
This intervention helped increase work completion of my student during intervention sessions.	1	2	3	4
I am likely to use this intervention or related strategies for future students.	1	2	3	4

Any other comments on the intervention (include things that were helpful, not helpful, things you would have liked, things that could have been done differently):