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## The Role of Choice Versus Preference: An Analysis of Why Choice Interventions Work

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The Role of Choice Versus Preference:  
An Analysis of Why Choice Interventions Work

by

John D. Adelinis

A thesis submitted in partial fulfillment  
of the requirements for the degree of  
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ABSTRACT

Previous research has shown that providing students with the opportunity to choose the type of academic assignment could reduce a variety of problem behavior. However, procedural limitations of previous research prevent definitive conclusions regarding the mechanism by which choice interventions effect behavioral change. Furthermore, because research related to choice interventions has been limited primarily to children with developmental and emotional disabilities, the generality of such interventions is unclear. Therefore, the current study set out to extend the efforts of previous researchers by attempting to further isolate the mechanism by which choice procedures produce improved behavioral performance and attempted to further assess the generality of choice procedures by examining its effects on the behavior (e.g., maladaptive behavior, on-task behavior, academic performance) of a population (i.e., typically developing adolescent youth) not frequently targeted.

## CHAPTER 1

### INTRODUCTION

Free will is a philosophical doctrine suggesting that an individual is “free” to make a choice and that such a choice may be impervious to the pressure of external influences. It is a concept that pervades many facets of our lives. For example, children are frequently reminded that they can grow to become what ever they want or that in order to succeed they must “make good choices”, presumably to avoid making bad ones. The concept of choice is so deeply engrained in our society that when one perceives that an opportunity to make a choice has been restricted, or altogether removed, he may display a variety of measures of countercontrol (Skinner, 1971). Such measures may involve avoidance or escape from those conditions in which behavior is perceived to be under control. In more extreme cases, countercontrol may be exerted through force, aggression, or attack. Interestingly, reactions involving countercontrol are less likely to occur when there is an opportunity to make a choice, even if that choice is merely an illusion. Given the societal importance of one’s right to make a choice, it is only natural that it would become a topic of investigation within the psychological literature.

The topic of choice has become more than just a peripheral concept deserving of attention only prior to initiating a study (e.g., informed consent)

and/or within the provision of clinical services (e.g., person-centered planning; Kincaid, 1996). It has become, in and of itself, a topic researchers consider worthy of exploration, as exemplified by a review study conducted by Kern, Vorndran, Hilt, Ringdhal, Adelman, and Dunlap (1998). Kern et al. identified a large number of research articles within the behavior analytic literature that were related to the topic of choice. The authors noted that each of the studies fit into one of three general categories, including 1) examining the use of choice as a means of measuring preference, 2) exploring strategies for increasing choice responding, and 3) using choice as an independent variable (i.e., intervention). Although research related to choice is abundant in the literature, according to the authors, between the years of 1975 and 1996, only a small number of studies (i.e., 14) were conducted wherein choice as an intervention was the topic of investigation. Since 1996, only three additional publications on this subject matter were reported in the literature (Killu, Clare, & Im, 1999; Powell & Nelson, 1997; Romaniuk, Miltenberger, Conyers, Jenner, Jurgens, & Ringenberg, 2002). Given the relative paucity of research studies evaluating the use of choice as an antecedent control invention, this line of research will serve as the topic for the following discussion.

Parsons, Reid, Reynolds, and Bumgarner (1990), using an alternating treatments design, showed that conditions involving either therapist-selected high-preference activities (i.e., no-choice high preference) or participant selected activities (i.e., choice) were equally effective in increasing the on-task behavior of four adults with mental retardation, relative to a condition where participants

were provided therapist-selected low-preference activities (i.e., no-choice low preference). These results showed that providing a choice or simply providing access to previously identified high preference tasks could produce an increase in work productivity.

Not only do the results of the Parsons et al. (1990) study convincingly illustrate the clinical value associated with the use of choice procedures within a vocational setting, but the authors' use of a no choice high-preference condition allowed for a more fine grain examination of the mechanism by which choice procedures affect behavior. That is, it is unclear whether the effects associated with the use of choice procedures are related directly to an individual's opportunity to select a stimulus (i.e., choice), or alternatively, if the provision of choice simply results in access to more highly preferred stimuli (i.e., preference). Regarding the latter supposition, providing one with choice among stimuli likely results in an increased probability that one will be provided access to relatively high-preference stimuli. Access to such high preference stimuli may serve as an establishing operation (Michael, 1993) that diminishes the evocative properties of the work context, in turn, decreasing the occurrence of escape maintained problem behavior (assuming that problem behavior occurring during work related contexts is escape maintained). Therefore, by including a no choice high-preference-task condition and showing that such a condition could produce outcomes similar to those obtained during a choice condition, results of the Parsons et al. study suggest that the more salient variable inherent in choice procedures is preference rather than the provision of choice.



Unfortunately, a limitation of the Parsons et al. study was the absence of a choice low-preference task condition. A condition in which choice was provided among low-preference activities may have functioned as a better control for preference. Furthermore, inclusion of such a condition would have allowed for a more stringent test of the treatment integrity of choice procedures by evaluating the extent to which such procedures could supersede the effects of exposing individuals to low-preference, sometimes aversive, activities (e.g., the hypothesized establishing operation). This is of importance since, for some persons identifying high preference vocational and/or academic tasks may be difficult, if not impossible.

Another study that showed the effects of choice interventions in vocational settings was conducted by Seybert, Dunlap, and Ferro (1996). The authors evaluated the effects of a choice intervention within a vocational setting by providing participants between the ages of 13 and 22 years who had been diagnosed with moderate to severe mental retardation with a choice between several vocational and domestic tasks. Using a reversal design, the authors demonstrated that adaptive and maladaptive behavior occurred at higher and lower levels, respectively, in the choice condition relative to the no-choice condition. Findings of the authors' study provide an additional demonstration of the utility of choice procedures for use in vocational settings as a means of improving performance related to task completion and maladaptive behavior

Research conducted by Bambara, Ager, and Koger (1994) further evaluated the effects of choice procedures on behavior within a vocational setting

by conducting several manipulations across two studies. During study 1, the authors exposed three adult participants, who were diagnosed with moderate to profound mental retardation, to choice, no choice high-preference, and no choice low-preference conditions using a multi-element design. Results from study 1 showed that the choice and the no choice high-preference task conditions were equally effective in increasing on-task behavior relative to a condition where participants were assigned low-preference vocational tasks. In study 2, the authors exposed participants to choice and no-choice conditions while attempting to hold preference constant by using tasks of similar preference (e.g., moderately preferred) across choice and no-choice conditions. The results of study 2 showed little difference in the level of on-task behavior across the two experimental conditions. The authors concluded that the combined results of study 1 and study 2 suggest that the effects stemming from the use of choice procedures may be a function of preference rather than choice. Although the authors extended the work of Parsons et al. (1990) by further examining the role of preference in choice procedures, much like the Parsons et al. study, the authors did not include a condition wherein participants would be provided a choice among low preference activities. Again, such a condition would have provided a better test for the effects associated with choice procedures. Also, the absence of a baseline established prior to experimental manipulations prevents conclusions to be drawn regarding the efficacy of the described procedures relative to naturally occurring conditions expected within a vocational setting.

In addition to vocational settings, researchers have assessed the use of choice procedures within academic contexts. For example, Powell and Nelson (1997) evaluated the effects of providing a 7-year-old student diagnosed with Attention-Deficit/Hyperactivity Disorder with a choice of academic assignment on an aggregate measure of “undesirable behavior”. The authors, using a within-subject experimental design (i.e., within series design), compared the effects of choice and no-choice experimental conditions on several topographies of the student’s problem behavior. Results showed that providing the student an opportunity to select academic assignments (i.e., choice) produced a decrease in problem behavior. However, the authors noted that conclusions regarding the effects of the choice intervention on academic performance (i.e., “achievement”) could not be established due to the absence of such a measure. Despite this shortcoming, the authors contributed to the choice-making literature in at least two ways. First, they used choice as an intervention in a general education classroom, and second, they demonstrated the ease with which choice procedures could be implemented by using staff members who were permanently assigned to the class.

In an earlier study, Dunlap et al. (1994) explored the utility of choice procedures within an academic setting as a means of decreasing problem behavior and increasing student engagement. In an initial study, the authors showed that providing two emotionally handicapped 11-year-old students with an opportunity to choose their work assignments produced lower levels of problem behavior and higher levels of task engagement relative to conditions where

teachers selected assignments (i.e., no choice). In a follow-up study, the authors sought to further discriminate the mechanism by which behavior change occurs when individuals are provided with a choice by yoking the work assignment selections (i.e., the choice of book for an adult to read to him) made by a 5 year-old student during a choice condition to a subsequent no-choice condition. The authors found that the choice conditions produced greater clinical outcomes (increased attending and decreased off-task behavior) than the no choice yoked conditions, even when the type of activity and the sequence in which they were delivered remained constant across both conditions. Therefore, the authors concluded that behavior resulting from the use of choice procedures was related to the act of choosing, rather than preference. By yoking the assignments selected during the choice condition to the subsequent no choice condition, the authors seemingly arranged an adequate control for preference. However, supplemental data collected during the second study showed considerable variability in the assignments selected by the participant across choice conditions. That is, the participant demonstrated a shift in preference across two temporally distal choice conditions; therefore, it is reasonable to suggest that the participant's preference for assignments similarly may have shifted in the time between the choice condition and the following no-choice yoked condition. Such a preference shift may have mitigated the efficacy of the no-choice yoked condition as a control for preference. Therefore, conclusions related to the results of study two should be regarded as tentative.

Killu, Clare, and Im (1999) used preference assessments to identify the relative preference of 20 familiar spelling assignments prior to exposing three participants, who were diagnosed as emotionally impaired, mentally impaired, and/or learning disabled, to a series of choice and no-choice experimental conditions. Using an ABCDEF design (choice of preferred tasks, choice of non-preferred tasks, no choice of preferred tasks, no choice of non-preferred tasks, no-choice of preferred tasks [yoked control], and no-choice of non-preferred tasks [yoked control]), the authors conducted systematic manipulations along dimensions of preference (i.e., preferred v. non preferred) and choice (i.e., choice v. no choice). The authors found that participant on-task behavior increased during sessions where access to high preference activities was provided, independent of whether or not they were provided an opportunity to select assignments (i.e., choice). These results suggest that the variable of importance for their participants was not the provision of choice, but access to preferred activities for which the provision of choice allows. The authors extended the research related to choice interventions and contributed to the behavior analytic literature by providing yet another demonstration of the clinical utility of choice procedures as an antecedent invention in academic settings and by more effectively examining the role of preference in outcomes resulting from such procedures.

More recently, a study conducted by Romaniuk, Miltenberger, Conyers, Jenner, Jurgens, and Ringenberg (2002) investigated the extent to which the efficacy of choice interventions is related to behavioral function (e.g., escape

maintained v. attention maintained). The authors conducted analyses to identify the function of problem behavior for seven elementary school-aged participants with various psychological disorders, including ADHD, mood disorder (unspecified), and developmental delays prior to exposing each participant to choice and no-choice conditions. Using a series of reversal designs, the authors concluded that problem behavior was much more sensitive to choice interventions when behavior was found to be maintained by negative reinforcement in the form of escape rather than positive reinforcement in the form of attention. Also, the authors provided evidence of the integrity of choice procedures by evaluating their utility in the absence of relevant extinction components (i.e., escape remained available for instances of problem behavior)

To date, the reliable outcomes produced by the use of choice procedures lend support to the argument that choice should not only be considered an ethical standard for which providers strive prior to the provision of clinical services, but also as an appropriate antecedent manipulation toward the treatment of a variety of escape maintained target behavior across distinct settings. However, the fairly narrow scope with which choice procedures have been tested indicate a need for additional research. For example, of the number of research articles within the behavior analytic literature related to the use of choice as an antecedent intervention, only a small percentage (i.e., 18%) have been conducted with participants who have not been diagnosed with developmental disability and/or severe mental impairment. Of those studies conducted with participants without developmental disabilities, none have been

conducted with adolescents. Therefore, there remains a need for additional tests of generality.

Also, limitations of previous research preclude definitive conclusions regarding the mechanism by which choice procedures operate. For example, the absence of a choice low-preference condition in the Bambara et al. (1994) study prevents conclusions regarding the role of choice in outcomes produced by choice procedures. Also, the Dunlap et al. (1994) investigation showed that the participant from study two displayed shifts in preference across time thereby bringing into question the adequacy of the authors' no-choice yoked condition as a control for preference. Similarly, although Parsons et al. (1990) showed that a no choice low-preference condition was as effective as a choice condition in producing desired outcomes, a comparison of such conditions does not provide insight to the variables responsible for the efficacy of the choice condition (i.e., choice v. preference). Finally, although Killu et al. (1999) attempted to control for preference shifts across time so that the role of preference could be more clearly identified, a pre-study preference assessment may not be the most effective approach. That is, one's preference can vary from minute to minute; therefore, more frequently conducted (i.e., pre-session rather than pre-study) preference assessments should be conducted to better capture and control for shifts in preference. The results of Killu et al. are impressive; however, similar results could be bolstered with the use of a more stringent experimental design (e.g., one allowing for reversal).

Although research has demonstrated the clinical utility of choice procedures in a variety of settings when used as an antecedent based intervention, there remains a need for additional research that will further explore the generality of outcomes produced by choice procedures and to better isolate the variables (i.e., choice v. preference) responsible for such outcomes. Therefore, the present research will use procedures similar to those used in previously conducted research to further assess the generality of choice procedures by examining its effects on the behavior (e.g., maladaptive behavior, on-task behavior, academic performance) of a population (i.e., typically developing adolescent youth) not frequently targeted. Furthermore, the current study will extend the efforts of previous researchers by attempting to further isolate the mechanism by which choice procedures produce improved behavioral performance by first, using pre-session preference assessments as a means of controlling for preference shifts across time and second, by exposing participants to no choice high-preference, no choice low-preference, choice high-preference, and choice low-preference conditions.



## CHAPTER TWO

### METHOD

#### *Participants and Setting*

Participants in the current study included two typically developing (i.e., non- developmentally delayed) participants. Both Sam (age 13) and Tony (age 12) were in 7<sup>th</sup> grade at a public charter school. Their teacher also participated in the study. Sam and Tony were selected from a small sample of students (four) that were eligible for inclusion based on the recommendation of the University of South Florida's Institutional Board Review Board (IRB) (i.e., the IRB recommended selecting participants among those students who lived with biological parents as opposed to foster parents). However, Sam and Tony's inclusion was supported by direct observation of each participant and interview of school staff that indicated each student displayed several topographies of problem behavior (e.g., cursing, aggression, etc.) and/or demonstrated a sub par academic performance (e.g., below average grades). All sessions were conducted in each participant's respective classroom. For both Sam and Tony, sessions were conducted during their Social Studies class.

All procedures were approved by the university's Institutional Review Board. Parental consent and student assent also were obtained for each participant and their respective teachers prior to the start of data collection.

### *Dependent Variables and Measurement*

During all sessions (except preference assessments), data were collected on four student behaviors (on-task, talking to other students, inappropriate verbalizations, and aggression) using a partial interval recording and one student behavior (in-seat) using whole interval. *On-task* was defined as orienting toward the assignment, not directing attention to unrelated task for more than 5 s, and displaying behavior required for assignment completion (e.g., completing a cross word puzzle). *Talking to other students* was defined as any verbal behavior between participant and other students except for questions or statements relating to work assignment. *Inappropriate verbalizations* were defined as any verbal behavior consisting of cursing, verbal threats, or insults. *Aggression* was defined as any physical contact between participant and others involving hitting, kicking, pulling hair, pushing, or pinching. *In-seat* was defined as contact between buttocks and chair seat. Data also were collected on teacher interactions, which were defined as any verbal/physical response by the teacher directed toward the participant.

Each 20-min observation session was partitioned into 10-s intervals so that data collectors could indicate whether or not responding occurred during each respective interval. A device that emitted a tone to signal the end of one interval and the beginning of a subsequent interval was used to cue observers to record the presence or absence of target behavior within each interval.

Permanent product data also were collected during each session.

*Assignment scores* were defined as the total number of correct responses

divided by total number possible responses multiplied by 100%. Assignments were collected and scored by the teacher at the end of each session.

Data during all sessions were collected by the researcher and a teacher's aid. The teacher's aid was trained prior to the onset of the study by the researcher. She was provided operational definitions for all dependent variables and was required to practice data collection until she reached a level of competency (90% agreement for 3 consecutive sessions). Competency was met in six 10-minute sessions.

#### *Interobserver Agreement*

During 25% and 31% of sessions for Sam and Tony, respectively, a second observer independently collected data on all relevant dependent variables. Interobserver agreement checks were spaced across the study so that measures were obtained across all conditions. During all assessments, interobserver agreement was calculated by dividing the number of intervals with agreement divided by the number of intervals with agreements plus intervals with disagreements and multiplying by 100%. For Sam IOA coefficients were as follows: on-task (M= 92%, range 89%-97%); in-seat (M= 95%, range 93%-98%); talking to other students (M= 98%, range 98%- 99%); inappropriate verbalizations (M= 97%, range 93%-100%); aggression (M= 100%); and teacher interactions (M=98%, range 98%-99%). For Tony, IOA coefficients were as follows: on-task (M= 83%, range 76%-89%); in-seat (M= 94%, range 92%-99%); talking to other students (M= 98%, range 97%- 100%); inappropriate

verbalizations (M= 99%, range 98%-100%); aggression (M= 100%); and teacher interactions (M=98%, range 95%-100%)

### *Preference Assessments*

Prior to each experimental session, a paired-choice preference assessment as described by Fisher, Piazza, Bowman, Hagopian, Owens, and Slevin (1992) was conducted with each student. Just prior to the start of each session (i.e., no longer than 10 min. before the start of an assignment), the teacher provided the researcher with five variations of a Social Studies assignment (i.e., Crossword Puzzle, True or False, Fill in the Blank, Short Answer, and Multiple Choice.). Each type of assignment (e.g., "True or False") was printed on a separate card. Two cards were then presented to the student and the student was asked to select the one card with type of assignment he would most prefer. This procedure was repeated until each of the cards had been presented with every other card once. During the presentation of pairs, the researcher recorded the number of times each assignment was chosen. The assignment chosen most frequently was defined as the high preference assignment, whereas as the one chosen least frequently was as the low preference assignment. Although within each preference assessment there were multiple types of assignments, the subject matter of each type of assignment was identical. That is, each type of assignment was pulled from the same chapter of a Social Studies curriculum. Therefore, the only difference between assignments was the format of the work.

### *Experimental Conditions and Procedures*

*No choice (baseline).* During the no choice condition, participants were provided an assignment (i.e., Crossword Puzzle, True or False, Fill in the Blank, Short Answer, or Multiple Choice) that was selected by the participants' instructor with no instruction from this investigator. That is, the no choice condition was included as a free operant context that was intended to capture pre-intervention conditions and their effects on participant maladaptive and adaptive behavior.

*No choice / low preference assignments.* The no-choice / low preference condition was similar to the no choice condition in that participants were not provided an opportunity to choose their assignment. However, the assignments selected for the participant were the ones identified as the least preferred during the pre-session preference assessment.

*No choice / high preference assignments.* This condition was similar to the no choice / low preference condition in that each participant was not allowed to choose their assignment. However, rather than selecting the least preferred assignment, the researcher selected the assignment identified as most preferred during the pre-session preference assessment.

*Choice / high preference assignments.* During this condition, each participant was provided a choice among the two most highly preferred assignments identified during the pre-session preference assessment.

*Choice / low preference assignments.* This condition was similar to the choice / high preference condition, except that the participants were provided a choice among the two least preferred assignments identified during the pre-session preference assessment.

Assignments used across baseline and experimental sessions were consistent. That is, the same types of assignments were used for all conditions. They differed only with regard to student preference and provision of choice.

The relative effects of the experimental conditions were assessed using an alternating treatments design (with an initial baseline phase). The order of treatment conditions was arbitrarily selected. That is, four pieces of paper, each with the name of one condition, were placed in a cup and one was blindly selected from the cup prior to each session. Selected pieces of paper were not replaced until all pieces of paper had been selected. However, during the initial sessions of the multielement phase, two sessions in the same condition were conducted daily. For example, if the choice / high preference condition was selected on a given day, two consecutive choice / high preference sessions would be conducted. For Sam, this method of conducting sessions was in place for two days (four sessions); for Tony, this method was in place for four days (eight sessions). Because there was a need to accelerate the manner in which sessions were conducted and a need to increase the number of exposures to each condition, three sessions were conducted daily and the condition for each session was arbitrarily selected without replacement using the same selection procedure described above.

### *Social Validity*

The school principal and teachers were interviewed to solicit information to identify the array of assignments required for use in the study to ensure the use of socially valid procedures. Furthermore, all consumers (i.e., teachers and

student participants) were asked to complete a questionnaire (Appendix B) prior to the start the study and once again at the end of the study to provide a measure of satisfaction with the procedures and outcomes.

## CHAPTER THREE

### RESULTS

Figure 1 shows results of the preference assessments for Sam and Tony. Each type of assignment presented during the preference assessment is represented by a single color. The X-axis represents a ranking system ranging from 1 (most preferred) to 5 (least preferred). The Y-axis represents the percentage of preference assessment sessions wherein a type of assignment (e.g., True or False) ranked a particular ranking. For example, for Sam Fill in the Blank, True or False, and Puzzle were all selected at least once as the most highly preferred type of assignment during the course of the study. Data reveal that both participants demonstrated shifts in preference across the course of the study. For example, Sam showed a shift in preference relating to the “fill in the blank” assignment that ranged in preference from most preferred to least preferred. More specifically, three assignment types were identified as most preferred with four different types of assignments having been identified as second most preferred during at least one preference assessment. Similar shifts occurred with the lower ranked assignment types as well. Tony also demonstrated shifts in preference, though his preferences were less varied than Sam’s. For example, puzzle assignments varied in preference from most preferred to third most preferred. However, such shifts were not noticeable amongst the least preferred assignments (fill in the blank and short answer



ranked as fourth and fifth, respectively, during 100% of the preference assessment sessions.) Although shifts for either participant were not considerable, these results suggest that had assignment selection (participant and/or teacher based selection) been based solely on the results of a single preference assessment, participants may not have been provided access to the highest or lowest preferred assignments.

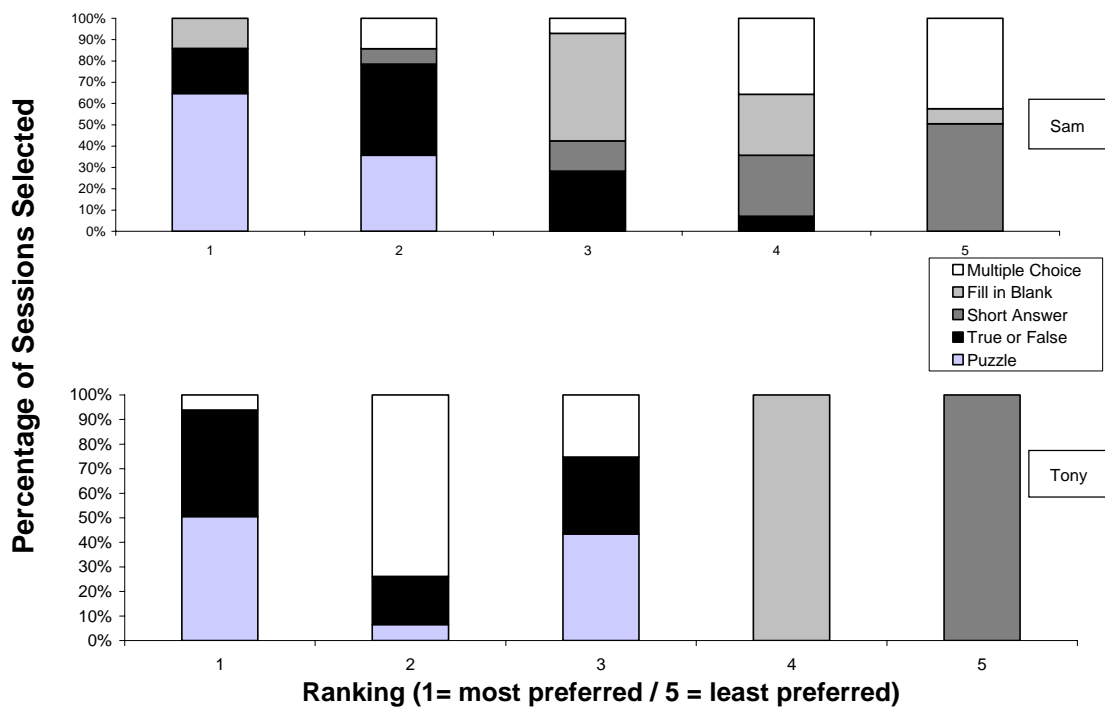


Figure 1. Bar Graph for Sam and Tony

Figure 2 presents Sam's data for on-task behavior, in-seat behavior, and talking-to-others. On-task behavior occurred at fairly low but stable levels across all conditions. However, there was slight increase in on-task behavior observed during the choice/high preference conditions. During baseline, Sam was on task

an average of 7% of the intervals observed (range, 2% to 10%). During the choice/high preference condition, the mean percentage of intervals on task increased to 19.7% (range, 1.6% to 28%), with all data points except one falling above the baseline range. For all other conditions, percentage of intervals remained within the baseline range (choice/low preference, M = 5.3%, range, 0% to 13%; no choice/high preference, M= 3.6%, range, 0% to 11%; no choice/low preference was 0% across all sessions).

Results related to in seat behavior were considerably more variable than on-task behavior with no clear response differentiation observed across phases or among experimental conditions. The mean percentage of intervals with in-seat behavior for baseline was 54.3% (range, 38% to 75%), though data were trending downward before the start of experimental manipulations. The choice/high preference condition yielded a mean score of 61.5% and data were highly variable (range, 28% to 96%). Considerable variability also was observed in the other conditions, though means tended to be lower (i.e., choice/low preference, M = 48.6%, range, 5.8% to 99%; no choice/high preference, M = 45.3%, range, 32% to 66%; no choice/low preference, M= 49.3, range, 5% to 99%).

During baseline, mean percentage of intervals with the occurrence of talking to others was 37.3% (range, 28% to 45%). Talking to others occurred at a consistently lower level across all experimental conditions relative to baseline with the lowest level of behavior observed during the no choice/high preference condition. Levels were stable across all experimental conditions (i.e., choice/high

preference, M=7.5%, range, 2.5% to 12%; choice/low preference, M=7.1%, range, 2.5% to 10%; no choice/high preference, M=18.3%, range, 11% to 30%; no choice/low preference, M=15.0% range, 4% to 26%).

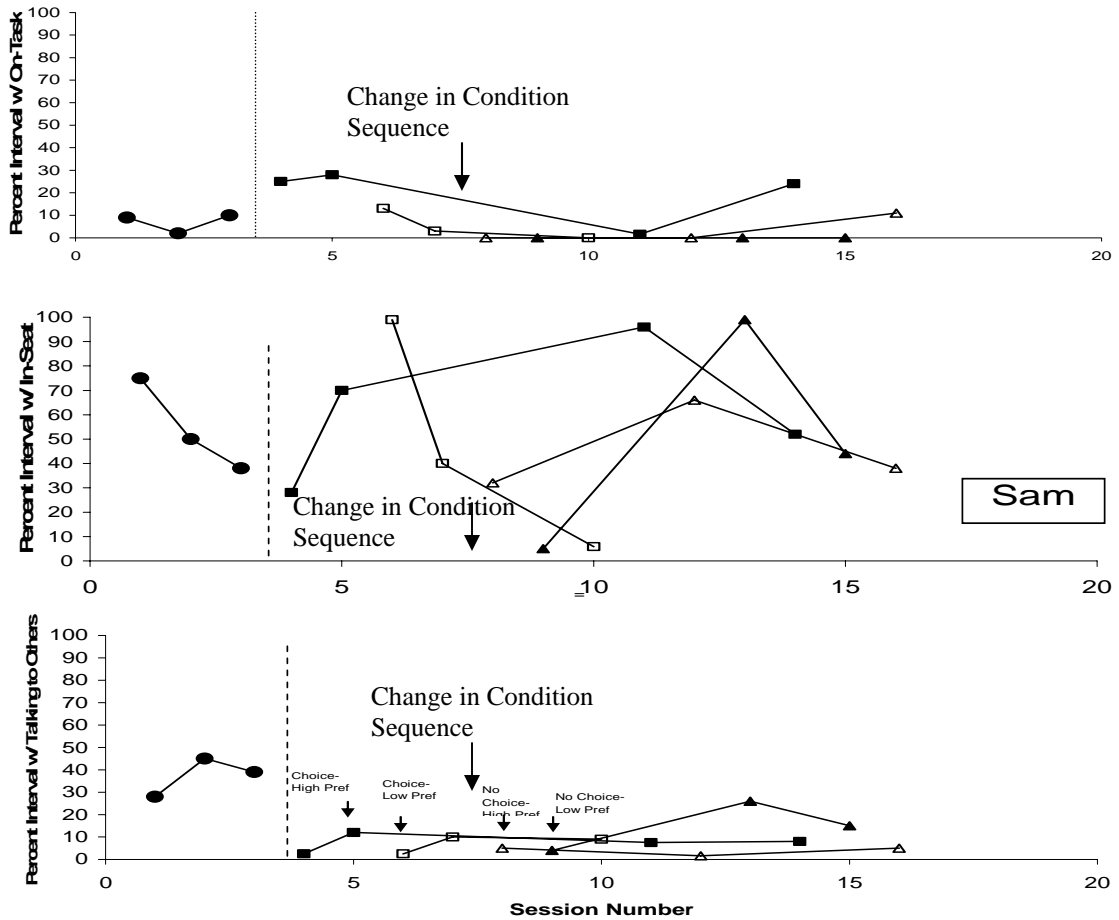


Figure 2. Sam Graph (Set One)

Figure 3 represents Sam's data for inappropriate verbalizations, aggression, and academic scores. During baseline, Sam's level of inappropriate verbalizations occurred at low and stable levels (M=15.6%; range, 10% to 20%). This behavior occurred at a lower level during experimental conditions relative to

baseline (i.e., choice/high preference, M=1.8%, range, 0% to 5%; choice/low preference, M=0.8%, range, 0% to 2.5%; no choice/high preference, M=3.9%, range, 1.6% to 5%; no choice/low preference, M=3.2%, range, 0% to 8%).

Aggression occurred at zero levels across all conditions.

During baseline, Sam's assignment scores were relatively low and somewhat variable (M = 6.6%; range, 0% to 35%). During experimental conditions, assignment scores were relatively high but variable in the choice/high preference condition (M = 25.5%; range, 0% to 52%), but the range of scores during the choice/high preference condition was comparable to that of baseline with the exception of the second session where assignment score was higher than any baseline scores. Interestingly, Sam obtained assignment scores of zero in all other experimental conditions.

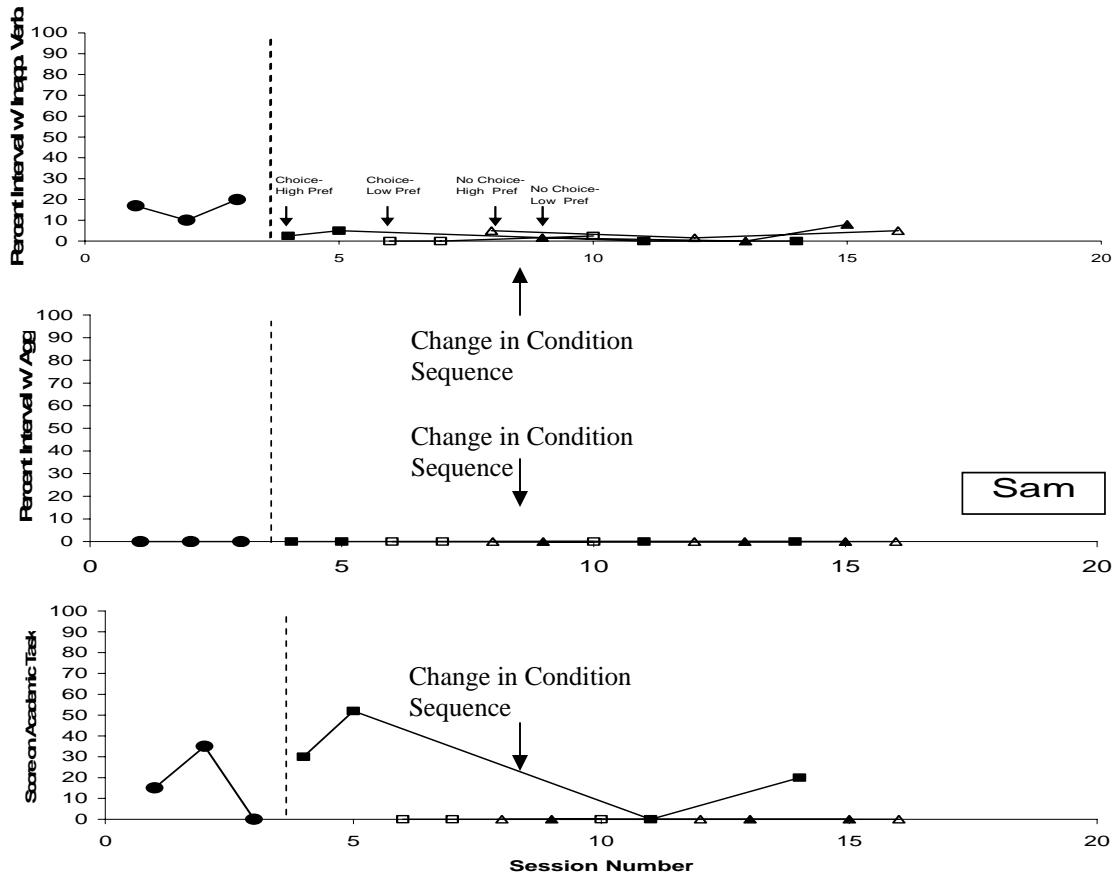


Figure 3. Sam Graph (Set Two)

Figure 4 represents Tony's data for on-task behavior, in-seat behavior, and talking-to-others. During baseline, a downward trend in on-task behavior was observed with a mean level of 51% (range, 32% to 72%). Introduction of each experimental condition resulted in a considerable increase in on-task behavior. More specifically, on-task behavior occurred at high and stable levels during the choice/high preference (M = 90%; range, 81% to 98%) and no choice/high preference (M = 93%; range, 85% to 100%). Levels of on-task behavior was slightly more variable during the choice/ low preference condition

(M = 63%; range, 2.5% to 87%) with the first three sessions resulting in a level higher than that observed during baseline; however, on-task behavior dropped to near zero during the last session of the choice/low preference condition. Finally, following an initial session during the no choice/low preference where the level of on-task behavior was higher than baseline, a considerable drop in level was observed during the final three sessions (M = 30%; range, 5% to 95%)

In seat behavior occurred at high and stable levels during all experimental conditions relative to baseline (M = 78%; range, 68% to 73%). The experimental phase produced slightly higher levels of in-seat behavior across conditions (i.e., choice/high preference condition, M=98%, range, 94% to 100%; choice/low preference, M = 96%, range, 92% to 99%; no choice/high preference, M= 98%, range, 96% to 100%; no choice/low preference was 96%, range 92% to 100%).

Talking to others occurred at a consistently lower level across all experimental conditions relative to baseline with the lowest level of behavior observed during the no choice/high preference condition. During baseline, mean percentage of intervals with the occurrence of talking to others was 16% (range, 2% to 30%). Following an upward trend in baseline, experimental conditions were introduced and a decrease in talking to other students was observed across all conditions. The greatest reduction in talking to others was observed during the no choice/high preference condition with a mean of 0%. The mean percent of intervals with talking to others during the choice/high preference condition was 2.8% (range, 0% to 6%). The choice/low preference condition produced a mean

of 7.8% (range, 0% to 20%). Finally, although the no choice/low preference condition also resulted in a reduction in talking to others with a mean of 10.4% (range, 1.6% to 18), a slight upward trend was observed.

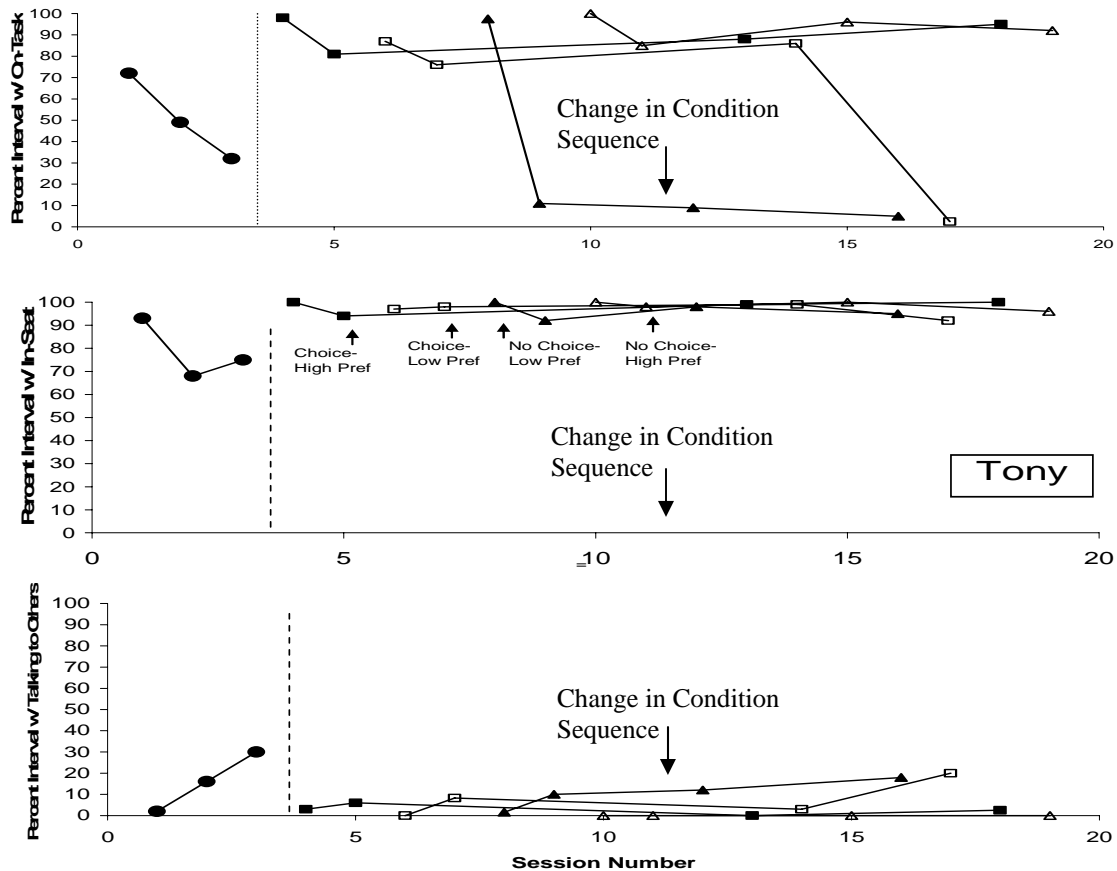


Figure 4. Tony Graph (Set One)

Figure 5 represents Tony's data for inappropriate verbalizations, aggression, and academic scores. During baseline, an upward trend in inappropriate verbalizations was observed with a mean percent of 12.3% (range, 0% to 22%). The introduction of the experimental phase resulted in one of the more dramatic changes in behavior with inappropriate verbalizations occurring at

near zero levels across all conditions (choice/high preference, M=0%; choice/low preference, M=0%; no choice/high preference, M=0%; no choice/low preference, M=0.5%, range, 0% to 2%).

As was the case with Sam, aggression occurred at zero levels across all conditions.

Finally, a considerable downward trend in assignment scores was observed during baseline with a mean of 55% (range, 30% to 100%). As was the case with on-task behavior, the onset of the experimental phase produced clinically significant changes in assignment scores across all conditions. The choice/high preference produced the greatest improvement in assignment scores with a mean of 91.3%, (range, 80% to 100%), followed by the no choice/high preference condition with a mean of 91% (range, 86% to 100%). Assignment scores were also high during the first three sessions of the choice/low preference condition before dropping to near zero during the final session (M= 59%, range, 0% to 82%). Finally, during the no choice/low preference condition, an initial session where assignment score was 75% was followed by a considerable drop in assignment score to near zero during the final three sessions (M= 18.7% range, 0% to 75%).



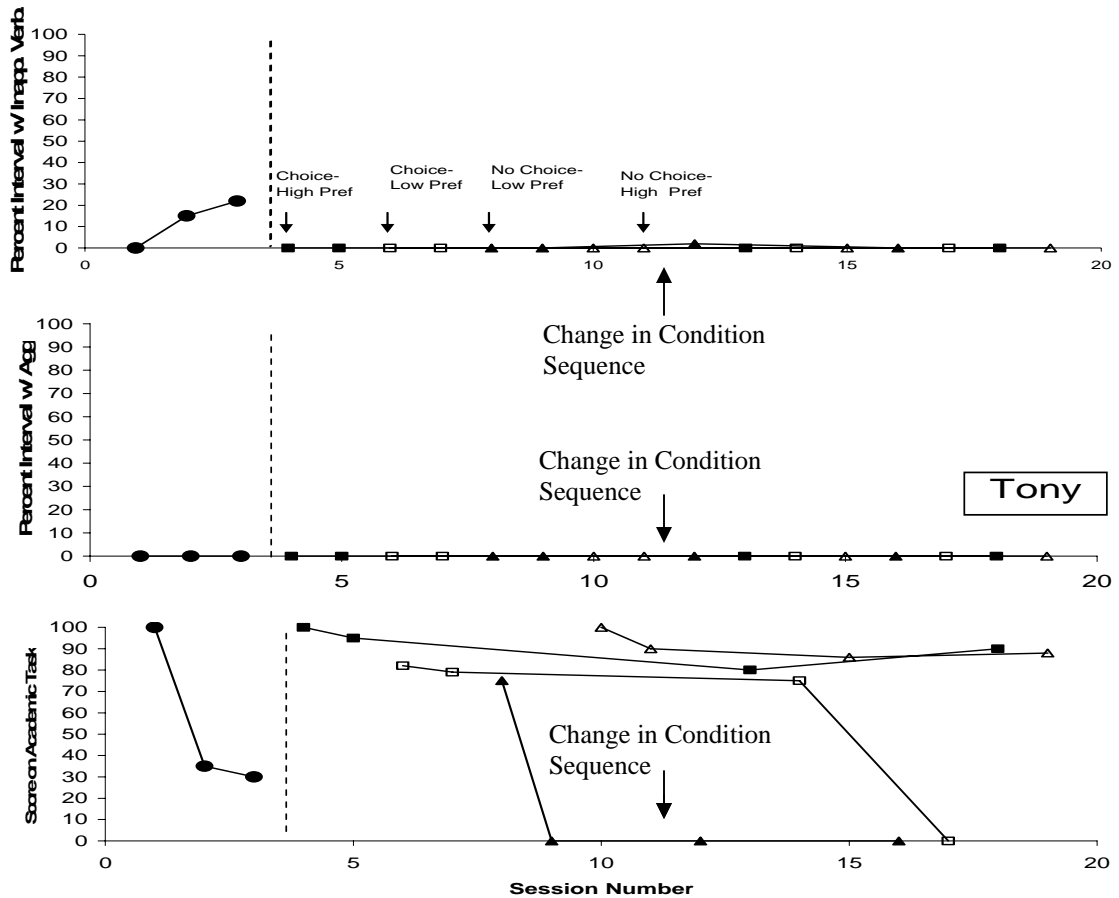


Figure 5. Tony Graph (Set Two)

In addition to student behavior, data were also collected on teacher behavior. More specifically, data were collected on the percentage of intervals with teacher-student interaction such that any potential relation between such interactions and change in targeted student behavior could be monitored and adequately interpreted. Figure 6 displays these data. For Sam, the percent of teacher interaction was low across baseline with a mean of 4.3% (range, 0% to 10%). The level of teacher interaction dropped during the choice/ high

preference condition to a mean of 1.75% (range 0% to 3%). A similar level of teacher interaction was observed during the choice/ low preference condition (M=1.7%, range 0% - 5%). Conversely, the level of teacher interaction during the no choice/ high preference condition was comparable to that of baseline with a mean of 4.3% (range 1% to 9%). Finally, the lowest level of teacher interaction was observed during the no choice/ low preference condition with a mean of 0.3% (range 0% - 1%). Most importantly there appeared to be no correlation between teacher interaction and change in Sam's behavior.

For Tony, teacher interaction was highest during baseline with a mean of 7.3% (range 3%-12%). Teacher interaction occurred at lower levels during the choice/ high preference condition (M= 5.3%, range 2% to14%). The lowest level of teacher interaction was observed during the choice/ low preference condition with a mean of 2.5% (range 0% to 5%). Teacher interaction occurred at a slightly higher level during the no choice/ high preference condition with a mean of 3.2% (range 0% to 9%). Finally, the no choice/ low preference condition was correlated with the highest level of teacher interaction relative to the other experimental conditions with a mean of 5.7% (range 0% to 12%). As was the case with Sam, there appeared to be no relation between interactions between Tony and the teacher and changes in behavior observed during experimental conditions.

Finally, participants (teacher and two students) were administered a social validity questionnaire prior to the initiation of the study and again at completion of the study. However, Sam refused complete both. Results related to results of the

social validity questionnaire can be found in Table 1. In general, both the teacher and student found the use of choice procedures to be an acceptable strategy toward the treatment of classroom disruptive behavior. Furthermore, responses related to questions remained constant across the pre and post questionnaires.

*Table 1. Social Validity Questionnaire*

	Student (Tony) Pre Study/Post Study	Teacher Pre Study/Post Study
<u><i>Need for Services (Pre-Study Only)</i></u>		
Do you feel that you (or the student) are in need improved behavior during academic contexts?	Yes	Yes
In which academic subject do you (or the student) need improvement?	Soc. Stud.	Soc. Stud. and Math
Which behavior, specifically, would you like to see improved?	On-Task, In Seat and Aggression	On-Task and In Seat
<u><i>Acceptability of Procedures (Pre-Study and Post-Study)</i></u>		
Would you like to be provided (or provide) choices with respect to academic assignments?	Yes/Yes	Yes/Yes
Do you think being provided (or providing) a choice of academic assignment would result in a positive change in your (or the student's) behavior?	Yes/Yes	Yes/Yes
Teachers Only: Do you think it would be feasible to provide students with a choice of academic assignment?		Yes/Yes

Teachers Only: Do you think you would be willing to provide students with a choice of academic assignment?

Yes/Yes

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Acceptability of Outcomes (Post-Study Only)

Did you notice a change in your (or the students) behavior at any point during the study?

“A little”

Yes

Which of the following conditions do you believe resulted in the greatest change in your (or the students) behavior.

Choice/High Preference

“All”

Which behavior, specifically, do you think was improved?

On-Task and Agg.

On-Task

## CHAPTER FOUR

### DISCUSSION

The previous work of researchers clearly has shown that providing individuals with choice can be an effective behavior change strategy for various topographies of behavior across a variety of settings (e.g., Bambara et al, 1994; Dunlap et al, 1994; Powell & Nelson, 1997; Seybert et al, 1996). Although the efforts of these researchers and others have clearly demonstrated the viability of choice based interventions, there remained continued debate related to the mechanism by which such procedures result in change in behavior. Specifically, it is unclear whether exposure to choice procedures simply placed participants in contact with high-preference activities; thereby mitigating the aversive qualities of the instruction (e.g., academic, vocational, etc.); or if alternatively, the clinical outcomes often observed with the use of choice procedures is a function of the act of choice making.

Although choice related research has resulted in a considerable contribution both to the clinical and research literature, concerns relating to prior methodology limit one from making definitive conclusions regarding the mechanism by which choice engenders behavioral change. Furthermore, participants in previously conducted research have been diagnosed with either developmental and/or emotional disabilities, thus limiting the generality of the

findings. Given these procedural limitations and the narrow scope with which the procedures have been tested, additional research related to choice was needed. Therefore, the current investigation set out to test the generality of choice procedures by evaluating their efficacy with typically developing students. Further, although the efforts of previous researchers have shed some light on the role of choice versus preference, limitations of their research only allow for tentative interpretations. The current investigation sought to further examine the role of choice and preference by exposing two students to baseline, choice high-preference, choice low-preference, no choice low-preference, and no choice high preference conditions using a modified multielement experimental design (with a baseline phase). Additionally, preference assessments were conducted prior to the start of each session to better control for shifts in preference across time, a confound encountered during previous research.

Surprisingly, results of the current investigation did not reveal consistent patterns of behavior change related to choice or preference variables for either of the participants. However, some effects are worth noting. Sam's results (Figures 2 and 3) showed changes in select topographies of behavior. For example, on-task behavior occurred at a slightly higher level in the choice/high preference condition relative to baseline and the other experimental conditions. It is also interesting to note that Sam's assignment scores were higher during the choice/high preference condition relative to other experimental conditions, but only one data point fell above the baseline range. The aforementioned results suggest that for Sam, the provision of choice amongst high preference activities

produced some differential responding, albeit clinically insignificant. That is, choice or access to high preference assignments in isolation would not have been sufficient as evidenced by the absence of behavior change in the other test conditions. Perhaps the most compelling finding for Sam is that the percentage of intervals in which he engaged in talking to other students was slightly lower in all experimental conditions relative to baseline. However, it is unclear how such an outcome was produced given the absence of similar patterns in other topographies of behavior.

For Tony, several improvements in target responses were observed (Figures 4 and 5). First, an increase in on-task behavior was observed relative to baseline in all conditions except no choice/low preference. In fact, on-task behavior during the no choice/low preference condition occurred at a level lower than that observed during the initial baseline phase. This outcome suggests that for Tony, on task behavior was equally affected by choice and preference. That is, the provision of choice could override the evocative properties of non-preferred tasks, but choice is not necessary if the assignment selected by the teacher is highly preferred. However, although the results related to on-task behavior constitute a clinically significant outcome, it's worth noting that the downward trend observed in on-task behavior during baseline may have resulted in levels comparable to those observed during the no choice/low preference condition if additional baseline sessions were conducted. A second interesting finding in Tony's data was that all experimental conditions produced higher levels of in-seat behavior relative to baseline sessions. This outcome is somewhat

surprising since the baseline condition was comparable, presumably, to the no choice/low preference experimental condition. This pattern may have been an artifact of experimental sessions more closely approximating a discrete trial with more salient start and stop points. That is, Tony may have been more motivated to work since it was made clear at the onset of the session that the session would terminate in 20 min, which afforded more predictability. Third, Tony's level of inappropriate verbalizations occurred at near zero levels during all experimental conditions relative to baseline sessions. Here again, this outcome may have been related to a perception of increased structure or formality which may have affected behavior. Finally, an interesting trend was observed with Tony's academic performance. More specifically, both choice conditions and the no choice/high preference conditions produced an increase in academic performance relative to baseline and no-choice/low preference sessions. Furthermore, it should be noted that during those sessions where academic score was at, or near, zero, Tony attempted little work. Therefore, low scores were the result of not doing work rather than doing the work incorrectly (as evidenced by Tony's level of On-Task behavior). This distinction is of importance because if low academic scores were related to the latter, one could argue that any differentiation observed amongst text conditions related to academic score could be an artifact of task complexity. These results suggest that for Tony simply providing access to high preference assignments can improve on-task behavior and academic performance; however, the provision of choice also appeared to have an effect on these behaviors as observed during the



choice/low preference condition. Therefore, for Tony choice and preference may be equally effective.

Neither participant showed significant shifts in preference across the course of the study. However, minor shifts (e.g., alternating between two types of assignments) were observed and could have resulted in an experimental confound had preference assessments not been conducted prior to each session to control for such shifts. More specifically, the absence of frequent preference assessments could have resulted in participant selection from among low preference assignments during those conditions calling for the use of high preference assignments and visa versa.

Although the procedures described in the current study address many of the methodological shortcomings of previous research related to the topic of choice, the current investigation is not without its own limitations. First, even if clear differentiation amongst conditions had been observed, the number of participants in the study precludes any strong conclusions regarding the effects of preference and/or choice nor does it allow for an adequate assessment of the external validity of choice interventions. Second, the sequence in which sessions were conducted during the multi-element phase was inconsistent. That is, sessions within a given condition were initially run consecutively, but later switched so that exposure to experimental conditions was sequential. This inconsistency was a direct function of the number of days remaining in the school year and the need to maximize the number of sessions conducted. Although this procedural shift likely did not result in a confound (e.g., sequence effects), it

brings into question the experimental rigor of the current study. Finally, for Tony, additional sessions should have been conducted to allow for behavioral patterns to stabilize. More specifically, the instability observed during the choice/low preference session toward the end of the study, particularly in relation to on-task behavior and assignment score, warrants additional exposure to all experimental conditions to be capable of making more definitive conclusions.

Limitations of the current study aside, there remains many reasons for why additional research related to the efficacy and acting mechanism of choice procedures for typically developing students is warranted. A direct replication of the procedures described in the current investigation should be considered to further evaluate the generality of choice procedures in academic settings and to more clearly elucidate the operant mechanism(s), which may account for behavior change. Future researchers should certainly conduct pre-session preference assessments if interested in learning more regarding the role of choice and preference. Also, if the following study were to be replicated, it is recommended that a single session be conducted daily to minimize the probability of confounds (e.g., sequence effects, multiple treatment interference) that could result from conducting sessions in rapid succession. Those interested in replicating the current study may also choose to include a more precise control condition. For example, the current study used a free operant baseline condition wherein the participants' teacher assigned one of the 5 assignment types used throughout the study. However, during 100% of baseline sessions for Sam and Tony, the teacher selected short answer assignments, which were found to be

amongst the least preferred type of assignment. An alternative and more precise control condition would involve having the teacher randomly assign one of the 5 assignment types per session until each had been presented at least once. Finally, given the experimental component (analysis of choice versus preference) of the current investigation, it may be of interest to future researchers to conduct such a study in a more controlled setting. Although applied research is important it is certainly not without its challenges, and can sometimes hinder one's ability to draw definitive conclusions regarding the relation between variables due to the lack of adequate control. Therefore, only after the role of choice and preference has been clearly identified should researchers apply choice procedures with typically developing students in traditional classroom settings so that the feasibility/generalizability of the choice interventions can be further assessed.

In addition to altering the procedures of the current study as described above, there remains several areas of research related to choice interventions that require further investigation. For example, it may be of interest to researchers/clinicians to extend the work of Romaniuk, Miltenberger, Conyers, Jenner, Jurgens, and Ringenberg (2002) by further assessing the relation between the efficacy of choice procedures and behavioral function. The current investigation did not identify the function of each participant's targeted behavior prior to the start of the study. Therefore, behavioral function may account for the discrepancies in outcomes observed across participants (e.g. moderate-small outcomes for Tony; small outcomes for Sam).

An additional area worthy of research in the future is one wherein the efficacy of choice procedures is compared across a variety of parameters including participant diagnosis, adjunctive behavioral measures (e.g., indices of student attitudes toward school, perceptions of autonomy, etc.) and behavioral intensity, to name a few. Such parametric research may provide clinicians with a guide to the effective and efficient management of behavior displayed by individuals with distinct needs.

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Appendix A

Partial/Whole Interval Data Collection

Participant Name \_\_\_\_\_

Session Number \_\_\_\_\_

IOA: Y or N

Date	Interval Number										
	1	2	3	4	5	6	7	8	9	10	
On-task (W)											
In Seat (W)											
Maladaptive Behavior #1 (P)											
Maladaptive Behavior #2 (P)											
Teacher Interaction											

Session Number \_\_\_\_\_

IOA: Y or N

Date	Interval Number										
	1	2	3	4	5	6	7	8	9	10	
On-task (W)											
In Seat (W)											
Maladaptive Behavior #1 (P)											
Maladaptive Behavior #2 (P)											
Teacher Interaction											

Session Number \_\_\_\_\_

IOA: Y or N

Date	Interval Number										
	1	2	3	4	5	6	7	8	9	10	
On-task (W)											
In Seat (W)											
Maladaptive Behavior #1 (P)											
Maladaptive Behavior #2 (P)											
Teacher Interaction											

## Appendix B

### Social Validity Questionnaire

Name: \_\_\_\_\_

Circle one: Pre-Study or Post Study

#### *Need for Services (Pre-Study Only)*

- 1) Do you feel that you (or the student) are in need improved behavior during academic contexts?
- 2) In which academic subject do you (or the student) need improvement?
- 3) Which behavior, specifically, would you like to see improved? (Circle all that apply)
  - a) On-Task    b) In-Seat    c) Academic Performance (i.e., better grades)
  - d) Aggression    e) Inappropriate Verbalizations    f) List Others:  
\_\_\_\_\_

#### *Acceptability of Procedures (Pre-Study and Post-Study)*

- 1) Would you like to be provided (or provide) choices with respect to academic assignments?
- 2) Do you think being provided (or providing) a choice of academic assignment would result in a positive change in your (or the student's) behavior?
- 3) Teachers Only: Do you think it would be feasible to provide students with a choice of academic assignment?
- 4) Teachers Only: Do you think you would be willing to provide students with a choice of academic assignment?



*Acceptability of Outcomes (Post-Study Only)*

- 1) Did you notice a change in your (or the students) behavior at any point during the study?
- 2) Which of the following conditions do you believe resulted in the greatest change in your (or the students) behavior? Circle all that apply.

Choice- High Preference

Choice-Low Preference

No Choice – High Preference

No Choice- Low preference

- 4) Which behavior, specifically, do you think was improved? (Circle all that apply)

a) On-Task   b) In-Seat   c) Academic Perf. (i.e., better grades)

d) Aggression   e) Inappropriate Verbalizations   f) List Others: