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An Analysis of Choice-Making as A Means To Decrease The Frequency of Self-Injurious Behaviors in Students with Severe Disabilities

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AN ANALYSIS OF CHOICE-MAKING AS A MEANS TO DECREASE THE
FREQUENCY OF SELF-INJURIOUS BEHAVIORS IN STUDENTS WITH SEVERE
DISABILITIES

by

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ABSTRACT

This single case multiple baseline research study examined choice-making as a means to decrease the frequency of self-injurious behaviors in six students with severe disabilities. Five males and one female between the ages of 14 and 21 participated in the five-week intervention. The following research questions were addressed: 1) Does the choice-making intervention reduce hitting, biting, and self-injurious behaviors? 2) How much time does the choice-making intervention add to the classroom teacher's preparation? 3) What costs are associated with the choice-making intervention during an average lesson? The choice-making intervention was associated with positive behavioral outcomes for all of the students. The intervention added both time and cost to the lessons. Implications and areas for future research are discussed.

Keywords: Choice-making, Severe Disabilities, Behavior Intervention

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LIST OF ACRONYMS

ACGR- adjusted cohort graduation rate

ESSA- Every Student Succeeds Act

ID- Intellectual Disability

IDEA- Individuals with Disabilities Education Act

IEP- Individual Education Program

SIB- Self- injurious behavior

LITERATURE REVIEW

A disability is a persistent impairment that limits an individual's cognitive, sensory, or physical performance (Gargiulo, 2010). Disabilities can emerge any time from birth to death, with levels of impairment occurring across a continuum. One billion people, or 15% of the world's population, experience some form of disability (World Bank, 2017). On average, people with disabilities are more likely to experience adverse socioeconomic outcomes, such as decreased education, poorer health outcomes, lower employment rates, and increased poverty rates (World Report on Disability, 2011). Approximately one-fifth of people with disabilities, or 140 million people, experience significant disabilities.

The overall percentage of people with disabilities in the United States is approximately 13% (American Community Survey, 2016). The United States population of children and students with disabilities who are served under the Individuals with Disabilities Education Act (IDEA, 2004) in the 50 states and the District of Columbia are: 1) infants and toddlers (birth-2), which represents 9,780,000 out of 326,000,000 individuals with disabilities, 2) children (3-5) representing 20,212,000 out of 326,000,000 individuals with disabilities, and children and students (6-21) representing 28,036,000 individuals with disabilities (U.S. Department of Education, 2017).

According to the 2017 World Report on Disability, the economic and social costs associated with disabilities are significant, but also difficult to quantify. This is because there are both direct and indirect costs associated with people who have disabilities. These individuals, their families, friends, employers, and society all endure the burden of

such costs. Direct costs include expenditures related to obtaining a reasonable standard of living, health care services, assistive devices, transportation, heating, special diets, and personal assistance (Mitra, Palmer, Kim, Mont, & Groce, 2017). Indirect costs, on the other hand, include a loss of productivity, substantive investments in education for students with disabilities, absence from work related to the disability, and the loss of taxes related to lowered productivity (Schaeffer, 2016). For example, the graduation rate for students with disabilities is 66% compared to 84% for students without disabilities (National Center for Educational Statistics, 2017; Common Core Data, n.d.).

According to the American Community Survey, 34% of people with disabilities within the age of 18-64 were employed in 2015, as compared to a 73% rate of employment for people without disabilities (Winsor et al., 2017). This significant discrepancy has been steadily increasing over the past 8 years ("Persons with a Disability: Labor Force Characteristics Summary", 2017). In addition, there are also non-economic costs, which can include both social isolation and stress ("World Report on Disability", 2011). People with disabilities also have a higher risk of being exposed to violence, unintentional injury, needs, and premature death then the general population (Forman-Hoffman et al., 2015).

The Individuals With Disabilities Education Act (IDEA)

The Individuals with Disabilities Education Act (2004) is a law that guarantees free and appropriate public education to eligible individuals with disabilities. IDEA

governs how early intervention, special education, and related services are offered to more than 6.5 million eligible individuals with disabilities. (About IDEA, n.d.)

There are thirteen federally recognized disability categories that can result in an Individual Education Program (IEP). These are: Specific Learning Disability, Other Health Impairment, Autism, Emotional Disturbance, Speech or Language Impairment, Visual Impairment including Blindness, Deafness, Hearing Impairment, Deaf-Blindness, Orthopedic Impairment, Intellectual Disability, Traumatic Brain Injury, and Multiple Disabilities. Five disability categories pertain to participants in this study. Each is defined below according to The Every Student Succeeds Act (ESSA, 2015).

1. Intellectual Disability (ID)- significantly subaverage general intellectual functioning, existing concurrently with deficits in adaptive behavior and manifested during the developmental period that adversely affects a child's educational performance.

2. Severe and Multiple Disabilities- concomitant impairments, the combination of which causes such severe educational needs that they cannot be accommodated in special education programs solely for one of the impairments. Multiple disabilities does not include deaf-blindness.

3. Autism- a developmental disability, generally evident before age three, that significantly affects verbal and nonverbal communication and social interaction, adversely affecting a child's educational performance. Other characteristics often associated with autism are: engagement in repetitive activities and stereotyped

movements, resistance to environmental change or change in daily routines, and unusual responses to sensory experiences.

4. Orthopedic Impairment- a severe orthopedic impairment that adversely affects a child's educational performance. The term includes impairments caused by a congenital anomaly (e.g., spina bifida, cleft lip), impairments caused by disease (e.g., poliomyelitis, bone tuberculosis), and impairments from other causes (e.g., cerebral palsy, amputations, and fractures or burns that cause contractures).

5. Speech or Language Impairment- a communication disorder, such as stuttering, impaired articulation, a language impairment, or a voice impairment, that adversely affects a child's educational performance.

Individuals with Disabilities and Self-Injurious Behaviors

Self-injurious behaviors (SIB) are defined as: head hitting with objects or hands, self-biting, pica (i.e., an eating disorder that consists of consuming items with no nutritional value, such as hair, dirt, etc.), self-scratching, hair-pulling, eye-hitting, skin-picking, and bruxism (i.e., a condition where the person grinds, gnashes, or clenches the teeth) (Buono, et al., 2012). These behaviors disrupt the learning of both the student and his or her classmates, often causing the environment to become dangerous for everyone (Wright, Cafferata, Keller, & Saren, 2013). It is suggested that SIB appears in approximately 7–12% of all people with ID (Hagopian & Leoni, 2017). Recent estimates of the occurrence of SIB in those with autism suggest it occurs on average in 27% of such individuals (Hagopian & Leoni, 2017).

While SIB may hinder the learning process by degrading fundamental skills that are used during interactions in educational, vocational, and community settings, it can also lead to hospitalization (Minshawi, et al., 2014). Self-injurious behaviors and other problem behaviors can cause a great deal of stress for families, while high costs are incurred in society as a result of treatment and placement (Williams, 2016). In addition, SIB has contributed to excessive healthcare costs (Kashner, 2017). Self-injurious behaviors can persist or worsen if left untreated, or if treatment is not working, (Hoch, 2016). Because of the nature of SIB, there has been little dispute over the significance and need for effective interventions (Symons, 2011). An individual with SIB can persistently incur contusions, lacerations, infections, concussions, loss of vision, and

permanent disfigurement (Hagopian, 2017). Self-injurious behavior is hypothesized to be

a learned behavior that is maintained by both positive and negative reinforcement

(Minshawi, et al., 2014). Such behaviors are actions that reduce the quality of life for the

person and those in his or her environment (Summers, et al., 2017). For example,

aggressive outbursts may cause accidental injuries to the person who is displaying the

aggression and/or others in the vicinity. These behaviors can lead to social withdrawal

from friends and families, which can cause feelings of isolation and depression

(Commonwealth of Australia, 2016).

Self-injurious behavior often occurs over a long period, is frequently

demonstrated, and is difficult to modify (Westling, 2015). However, the SIB needs to be

diminished for the student to become a productive member of society (Kappel, Dufresne,

& Mayer, 2012). Luckily, a number of interventions and strategies have been developed

to improve SIB (Symons, 2011).

<u>Choice-Making as an Intervention</u>

One of the most difficult tasks for a teacher or parent of a student with severe

disabilities is dealing with SIB (Westing, 2015). Students with severe disabilities in self-

contained classrooms often experience a lack of decision-making power. Their schedules

are rigid and often controlled by teachers or paraprofessionals. Assignments and

assessments are mandated by the teachers. Choice-making, however, focuses on allowing

students to make their own choice when it comes to materials, activities, etc. (Sparks,

2013).

People with severe disabilities seldom make their own choices (Wolf & Joannou, 2013). Their school days are planned out for them. However, once they reach the age of 21, they must be prepared to make independent decisions. That is why it is so important to teach choice-making as an integral component of the exceptional education curriculum for people with disabilities.

Choice-making is a flexible behavioral strategy (Browder, Wood, Thompson, & Ribuffo, 2014) that can enhance employment (Bush & Tassé, 2017), reduce expenses, and improve health care (Cardell, 2015). Choice-making allows students to make their own decisions related to materials and activities during the lesson. (Sparks, 2013). The provision of choice-making opportunities for students exhibiting challenging behaviors during structured and unstructured educational situations and activities has been successfully studied across student ages, educational settings (e.g., typical schools, alternative programs, residential facilities), community settings, and types of disabilities (e.g., Dunlap et al., 1994; Jolivette, Wehby, Canale, & Massey, 2001; Kern, Mantegna, Vorndran, Bailin, & Hilt, 2001; Ramsey, Jolivette, Kennedy, Fredrick, & Williams, in press; Ramsey, Jolivette, Puckett, Patterson, & Kennedy, 2010; Jolivette, Ennis, & Swoszowski, 2017).

In a simple choice-making intervention, a student chooses between two equivalent items. For example, the student makes a choice between two books with different topics that are written at the same lexical level. In a complex-choice intervention, however, students choose from more than two options and also determine the order of operations.

For example, the student might be offered eight options and would need to select

six to complete before determining the order in which they will be completed. Some students require a "choice board" using pictures, symbols, or icons. When laminating the choice boards and pictures—images used should depict only the items of interest—using as few background distractions as possible. (Dunlap & Liso, 2004).

Previous studies of choice-making identified differential effects related to increases in students' motivation. Researchers also found decreases in problematic behaviors (Diedrich, 2010). All of this ultimately helps develop personal freedom as a means to help individuals with disabilities function independently in society (Green, Mays, & Jolivette, 2011; Williams & Williams, 2012).

Research indicates choice-making can be effective for students with severe disabilities. Unfortunately, there is limited research examining the effectiveness of choice-making when used across multiple context areas (Hagopian & Leoni, 2017; Westing, 2015). This study will therefore examine the effectiveness of choice-making across eight domains (i.e., 1. mathematics, 2. time management, 3. money management, 4. personal information such as name, phone number, and address, 5. sight word recognition, 6. matching skills, 7. science, and 8. social studies).

There is adequate research examining the effectiveness of choice-making interventions as a means to facilitate behavioral change in students with severe disabilities (Hoch, Dzyak, & Burkhalter, 2016). Still, there remains a need for additional research examining the effectiveness of choice-making when it is used across multiple content areas as a means to reduce SIB in students with severe disabilities (Hagopian & Leoni, 2017; Kappel, Dufresne, & Mayer, 2012)

Table 1-Comparison of Differences Between Traditional and Choice-making Instruction

Traditional Instruction	Choice-Making Instruction
Schedules are rigid and often controlled.	Schedules are flexible.
Choice-making is minimal.	Choice-making is the base of all instruction.
Positive and negative reinforcements are typically chosen for the student by the teacher.	Positive and negative reinforcements are provided based on the student's choices.

Essential Components of a Choice-Making Curriculum

When being taught simple choices in a one-on-one setting there are behavior modification techniques such as positive and negative reinforcement (Slocum & Volmer, 2015), mediation (Berkman, Sheridan, Donahue, Halpern, & Crotty, 2013) and cognitive behavioral therapy (Craske, 2010) that are essential components of a choice-making curriculum.

There are a number of instructional techniques incorporated in the choice-making curriculum. These include positive and negative reinforcement, mediation, and cognitive behavioral therapy. Positive reinforcement consists of adding a preferred incentive to improve a behavior (Al-Ghamdi, 2017). Negative reinforcement consists of removing an aversive stimulus to improve behavior (Oakes, Lane, & Hirsch, 2018) Mediation is known to strengthen a teacher-student bond, which can show the student that the teacher cares about them. Mediation is an intervention that consists of the teacher-student-third party. The third-party person should be trained as an impartial mediator (Gross, 2016).

Cognitive behavioral therapy is a short-term, goal oriented intervention that helps

individuals alter challenging behaviors so that they can handle challenging situations

more clearly and effectively (Craske, 2010; Kerns, Collier, Lewin, & Storch, 2018).

<center>Behavior Intervention Plan</center>

A behavior intervention plan is based on the results of a functional behavior

assessment. A functional behavior assessment is an assessment that helps the student's

IEP team understand what is behind the problematic behaviors (Young, Andrews, Hayes,

& Valdez, 2018). A behavior intervention plan is written to describe the problematic

behavior, the rationale behind the behavior, and strategies that will help address the

behavior (Hogan, Knez, & Kahng, 2015).

<center>Self-Advocacy</center>

Self-advocacy is defined as a set of actions representing oneself or one's views

and interests (Morrisett, 2015). Studies indicate that self-advocacy skills, such as choice-

making, should be a high instructional priority when working with students with varied

disabilities across all levels of schooling (Carter, Lane, Jenkins, Magill, Germer, &

Greiner, 2015). Self-advocacy occurs when an individual takes control of his or her life

by managing the decisions and choices they make (Al-Sharif, 2018). Skills associated

with self-advocacy are known to enhance the quality of life's achievements, successes,

and goals (Williams, Ponting, & Ford, 2015).

METHODOLOGY

RQ1   Does the choice-making intervention reduce self-injurious behaviors when compared to business-as-usual during the baseline conditions?

RQ2   How much time does the choice-making intervention add to preparation?

RQ3   What costs are associated with the choice-making intervention in an average lesson?

Hypotheses:

1. Prior research indicates there is a reduction of problematic behaviors—such as hitting, biting, and self-injurious behaviors—when a choice-making intervention has been used with similar populations. This researcher therefore feels that using the choice-making intervention within the classroom will reduce the occurrence of these behaviors.

2. When any new intervention is used within a classroom, time needs to be spent preparing, learning, examining, and tailoring the curriculum. The choice-making curriculum will add time to lesson preparation and implementation.

3. Since the student will be using images of the tasks to put in order and complete; the researcher feels that the cost involved will depend on the materials being used.

Within this study, the researcher feels there will be additional costs to make the board, which includes pictures, Velcro, lamination, and tape.

Dependent Variables

- Behaviors (i.e., hitting, biting, and self-injurious)

- Time

- Cost

Independent Variables

- Condition (baseline vs. choices)

- Number of choices provided to the student

Inclusion and Exclusion Criteria

Individuals age 14 – 21 with severe disabilities in the researcher's self-contained classroom in a rural city in the southeastern United States will be screened for eligibility based on the number of SIB they exhibit during the school day. Individuals who exhibit more than six SIB in a 90-minute time period will be considered for inclusion in the study. Individuals who exhibit less than six SIB in a 90-minute time period will be excluded.

Design

This study uses a single-case non-concurrent multiple baseline withdrawal design with five phases (i.e., 1. baseline, 2. teach simple choices, 3. teach complex choices, 4. implement full choice-making intervention, 5. baseline).

Phases 1 and 5 (baseline) occurred over a five-day period, during which time the mean number of students' SIB was expected to stabilize. Phases 2, 3, and 4 also occurred over an anticipated five-day period. If stabilization did not occur, the five-day period was be extended until visual analysis of the SIB trend-line indicates stabilization of the SIB behaviors.

Participants and Setting

A self-contained classroom is designed for students with significant disabilities whose behavior or functional abilities are best served in personalized education settings. Self-contained classrooms typically provide small groups or individual students with more one-on-one attention. To be considered for placement in a self-contained setting the student has to have a disability that coincides with IDEA or ESSA and an IQ under 70. The self-contained classroom used for this intervention consists of eleven students, an Exceptional Student Education (ESE) teacher, and five paraprofessionals. The day starts at 7:20 a.m. and continues until 1:45 p.m. Students receive all core academics in the self-contained setting and participate with their general educational peers for lunch and electives.

Six high school students were selected to participate in this study. Selection was based on the following criteria: 1) classified as needing special education, 2) on an Individual Education Plan (IEP), 3) consistently exhibiting problem behaviors (i.e., hitting, biting, and self-injurious) that interferes with instruction, and 4) in a self-contained academic setting. For the purposes of this study, "self-contained" refers to students who stay within one classroom for all core academic subjects.

All six students were enrolled at the same school within the same self-contained classroom. Each session occurred within the self-contained classroom on the school campus.

Participant #1 - John is an 11th grade non-verbal high school student who is 17 years old. John has Autism, Intellectual Disability and a Language Impairment. He has difficulty staying on task and requires redirection to stay on task when involved in a non-preferred activity. John needs small group instruction. John is able to comply with adult directions if he is engaged in a preferred activity. When confronted with undesired tasks, he will have a tantrum or look for an escape. These tantrums may manifest into head banging, biting himself, hitting himself, other self-injurious behaviors, destruction of property, crying, screaming, and elopement.

Participant #2 - Scott is an 11th grade non-verbal student who is 17 years old. He has Autism Spectrum Disorder, Intellectual Disability and Language Impairment. He requires a Positive Intervention Plan. He has difficulty staying on task, and requires constant redirection to stay on task when involved in a non-preferred activity. Scott is able to comply with adult directions if he is engaged in a preferred activity. When confronted

with undesired tasks, he will have a tantrum, repeatedly saying "NO," start hitting himself, or look for an escape. These tantrums may manifest into head banging, biting himself, hitting himself, other self-injurious behaviors, hitting others, destruction of property, crying, and screaming. He has been aggressive toward adults.

Participant #3 - Rachel is a 12th grade student who is 18 years old with an Intellectual Disability. She requires a Positive Intervention Plan. She has difficulty staying on task. Rachel needs continuous redirection to stay on task when it is a non-preferred activity. She may exhibit maladaptive behaviors when presented with an undesired task. Rachel has a tendency to exhibit negative behaviors, such as head butting, elopement, biting, pushing, and self-injurious behavior (kicking and hitting herself), when she does not get what she wants or is asked to complete a non-preferred activity. Occasionally these behaviors will occur without an identifiable cause.

Participant #4 - Tony is a 10th grade student who is 16 years old with Autism, Language Impairment, and an Orthopedic Impairment. Tony requires verbal reminders to stay on task from his 1-1 paraprofessional. Tony needs continuous redirection to complete assignments, whether it is a non- preferred or preferred task. When left to work independently, Tony will often scribble or color the paper instead of completing his work or he will look to elope. Tony needs to be tested in a familiar place with a familiar person to administer his assessments. He also needs frequent breaks when completing a non-preferred task or assessment. Tony needs movement in order to remain engaged throughout the day.

Participant #5 - Liam is a 9th grade student who is 15 years old with Autism who receives Occupational Therapy. He has difficulty staying on task and focusing longer than 5 minutes. Liam needs redirection to complete assignments whether it is a non-preferred or preferred task from his 1-1 paraprofessional support. When left to work independently, Liam will look to elope. He also needs frequent breaks when completing a non-preferred task or assessment and he needs opportunity for movement.

Participant #6 -Mason is an 11th grade student who is 17 years old with Autism, Language Impairment, and Orthopedic Impairment. He has a difficulty staying on task and focusing longer than 10 minutes. Mason requires verbal reminders to stay on task, whether it is a non- preferred or preferred task from his 1-1 paraprofessional. When left to work independently, Mason will often rip, break, and/or eat the paper or writing utensil instead of completing his work, or he will look to elope. Mason will rip his clothing, curse, elope, and become physically violent (hit, scratch, bite, and kick others), when he is trying to avoid a task.

INSTRUMENTS

The researcher provided a list of academic tasks that were familiar and could be performed with competence by the participants. The activities selected were neither preferred nor rejected by the participants. Based on the researcher's lists, a list of options of eight assignments was developed for each student. The assignments are described in Table 2.

Table 2-Description of the Assignments That Were Used in This Study

1. Science Reading Assignment	Students will read and/or listen to a packet on a science-related story. After reading the story, the student will answer five questions. The five questions will be multiple choice; the correct answer needs to be circled. Each day they change.
2. Social Science Assignment	Students will read and/or listen to a packet on a social-science-related story. After reading the story, the student will answer five questions. The five questions will be multiple choice; the correct answer needs to be circled. Each day they change.
3. Time Assignment	The student will complete a worksheet on

	telling time. They will answer 10 questions related to telling time. Each month they change.
4. Money Assignment	The student will complete a worksheet on identifying bills/coins. They will answer 10 questions related to money. Each month they change.
5. Name, Address, and Phone Number Assignment	The student will copy and write their name, address, and phone number. Stays the same.
6. Math Assignment	The student will complete a math packet. It can consist of addition, subtraction, multiplication, division, time, and/ or money. Each week they change.
7. Matching Assignment	The students will choose the matching items in each question. There are 10 questions. Each week they change.
8. Sight Word Assignment	The student will read and/or repeat the sight word list they are working on. The researcher uses the Dolch sight words and

functional sight words.

PROCEDURE

The baseline phase included an examination of students' SIB when students do not have any choices. All assignments and assessments were mandated by the teacher. The timeframe for data collection remained consistent at 90 minutes throughout each day and phase. Each student had his or her-own data collection sheet, which includes an area for recording SIB, field notes related to the behaviors, preparation time, and cost of the lesson.

The researcher met with each participant prior to baseline in order to complete an individual interest inventory of snacks. These were used to reinforce students exhibiting positive behaviors.
The teacher took two snacks at a time and asked the student which snack they wanted. The teacher would eliminate the one that they did not choose, until there were only three snacks left. The choices were: Lucky Charms, dried apple slices, Honey Nut Cheerios, Fruit Loops, Cookie Crisps, Raisins', or Wild Berry Cheerios. The teacher recorded the top three choices for each student.

During the second phase (i.e., teach simple choices), students were taught how to make simple choices in a one-on-one setting using behavior modification techniques such as positive and negative reinforcement (Slocum & Volmer, 2015), mediation (Berkman, Sheridan, Donahue, Halpern, & Crotty, 2011) and cognitive behavioral therapy (Craske,

2010). Simple choices involve choosing between two similar tasks, such as completing an assignment on time management or completing one using mathematics.

The researcher placed two different science stories in front of each participant. The researcher pointed to the first story and told the participant the title and what the story was about. The researcher then pointed to the second story and told the participant the title and what that story was about. Finally, the researcher told the participant that they would get to choose either story. The participants were instructed they must pick only one. Once they did pick a story—either story—the researcher gave the student their preferred snack. The researcher provided student choice-making for science and social science stories.

Students received instruction on the first day, with follow-up instruction daily as necessary using the gradual release model (Pearson & Gallagher, 1983). Students were asked each day to describe the process by which they make simple choices. The researcher recorded evidence of the choice-making decisions and fidelity of implementing the strategy daily. As a result, the participants each demonstrated the ability to make a simple choice at the conclusion of the second phase. For example, the researcher had a whiteboard with two options on the top of the whiteboard: "science assignment" and "money assignment". Directly under the assignments was a T-Chart with "first" on the left side of the T-Chart and "last" on the right side of the T-Chart. The participants then chose which assignment they wanted to complete first and which one they wanted last, placing each on the correct side of the T-Chart. Once the student

completed placing their assignments in order and completed both assignments, they were able to choose a preferred snack.

Phase three (i.e., teaching complex choices) followed the same procedure as phase two. Complex choices involved choosing from multiple items. It involved the identification and rank ordering of the options. The researcher placed three options on the top of the board: "science assignment", "money assignment", and "time assignment". The participant then choice two of the assignments and placed them below the line on the first and second columns in the order that they wanted to complete both assignments. Once the participant chose both assignments, he or she then placed them in the correct column and completed the two assignments. The student was then able to choose one snack out of the three preferred snacks.

The researcher then placed four items on the top of the board: "science assignment", "social science assignment", "time assignment", and "money assignment". The participant picked three of the assignments they wanted to complete and put them in the first three columns in order of completion. Once the participant has chosen three assignments, he or she placed them in the correct column, and completed the three assignments. The students were able to choose one snack out of the three preferred snacks.

Afterwards, the researcher placed six items on the top of the board: "science assignment", "social science assignment", "time assignment", "math assignment", "matching assignment", and "money assignment". The participant picked five of the six assignments they wanted to complete and put them in the first five columns in order of

completion. Once the participant had chosen five assignments, placed them in the correct column, and completed the five assignments, the student was able to choose one snack out of the three preferred snacks.

During phase 4 (i.e., implementing the choice-making curriculum), the number of items students choose from was expanded to eight. The same procedures were followed. The researcher placed all eight items on the top of the board: "science assignment", "social science assignment", "time assignment", "sight word assignment", "name, address, and phone number assignment," "math assignment", "matching assignment," and "money assignment". The participant then picked six of the eight assignments they wanted to complete and put them in the six columns in order of completion. Once the participant had chosen, he or she was able to choose one snack out of the three preferred snacks.

Students were returned to a final baseline condition following phase 4. The second baseline condition included a reduction in the number of choices from eight to zero. After the fourth phase was the post-treatment follow-up phase. During this period, the intervention was withdrawn from the participants. During the post-treatment follow-up phase, the researcher took repeated measurements of the dependent variables and graphed the outcomes. Sequentially, the researcher examined the patterns and significance of the data points in the post-treatment follow-up phase and how they were related to the data points in the baseline and intervention phase to determine whether or not a change transpired (Boote, 2014).

Self-injurious behaviors were addressed following school policy and the student's Individual education program (IEP). The IEP is a legally-binding document that providing differential supports to each student based on their unique needs and preferences. No drugs or other devices were used in the study. Data was collected using a 60-second time-sampling technique (Berkman, Sheridan, Donahue, Halpern, & Crotty, 2013). Data was aggregated every 15 minutes. Total SIB was calculated by adding the 15-minute totals at the conclusion of the 90-minute data collection period each day.

Each 90-minute session contained eight assignments, of which the student was to complete six. Each lasted twelve minutes, with three minutes to get materials at the beginning, three minutes to put materials away at the end, and two-minute breaks in-between each assignment during the session. All six assignments must be completed within an hour and a half. The assignment length was selected because it seemed reasonable for the completion of several assignments if a participant is engaged in a full session with efficacy.

During the baseline phase, the researcher did not use the choice-making intervention. Each session started in order; all participants started on their assignments that were picked for them and completed six out of eight assignments during the baseline phase. Verbal instruction was given by the researcher to begin. The students obtained the assignment materials (e.g., reading assignments, pencil, clipboard, and dry erase markers) and took a seat. After working on the assignment for twelve minutes, the students were directed to turn in their assignment. Then the next assignments were selected and completed in the same manner. This happened for all six assignments. Once all six

assignments were handed in and materials put away, the session is completed. During the baseline phase, the assignments were assigned to the students. The students did not have a choice about which six assignments they would complete.

When the participants turned in an assignment, the researcher rewarded them with praise—such as, "Great job!" or, "Way to go!"—regardless of the quality of work submitted. The researcher and paraprofessional working with the participants provided redirection—such as let's continue our work—to each participant. The participants were redirected every 15-seconds that they were not engaged in the assignment. If the student started to show SIB, the student would be redirected to continue their assignment. If the student continued to show SIB after being redirected twice, the student would be given a 15-second break before again being redirected to continue their assignment. This redirection cycle was continued until all assignments were completed. During the treatment phase, the researcher used the choice-making intervention with the participants. All participants started on their six assignments that they had chosen from a list of eight option assignments. The verbal instruction was given by the researcher to begin. The students obtained the assignment materials (reading assignments, pencil, clipboard, and dry eases marker) and took a seat. After working on the assignment for twelve minutes, the students were directed to turn in their assignment. Then the next assignment was selected and completed in the same manner. This happened for all six assignments. Once all six assignments were handed in and materials put away, the session was completed. During the treatment phase, the students had a choice regarding which six assignments they would complete.

When the participants turned in an assignment, the researcher rewarded them with praise (such as: "Great job!" or "Way to go!"), regardless of the quality of work submitted. The researcher and Paraprofessional working with the participants provided redirection (such as, "Let's continue our work.") to each participant. The participants were redirected for each 15-seconds they were not engaged in the assignment. If the student started to show problematic behaviors, the student was redirected to continue their assignment. If the student continued to show problematic behavior after being redirected, the student was given a 15-second break before being redirected to continue their assignment. This redirection cycle continued for 90 minutes or until all assignments were completed, whichever came first.

During the post-treatment follow-up phase, the researcher did not use choice intervention. All participants worked on six teacher-chosen assignments. The students obtained the assignment materials (e.g., reading assignments, pencil, clipboard, and dry eases marker) and took a seat. After working on the assignment for twelve minutes, the students were directed to turn in their assignment. Then the next assignment was selected and completed in the same manner. This happened for all six assignments. Once all six assignments were handed in and materials put away, the session was completed. During the post-treatment follow-up phase, the students did not have a choice regarding which six assignments they would complete.

ANALYSIS

RQ1. Does the choice-making intervention reduce self-injurious behaviors when
compared to business-as-usual during the baseline conditions?

Daily SIB frequency counts were compiled and graphed each day. The data was
analyzed to determine whether there were changes in students' SIB over the course of
the intervention. Baseline conditions were compared to the choice-making
intervention described previously.

RQ2. How much time does the choice-making intervention add to preparation?

Daily preparation times were gathered, compiled, and graphed each day. A digital
clock was used to record preparation time from beginning to end. Preparation times
were recorded on the students' daily behavior tracking form. The data was analyzed
to determine whether there was a change in the amount of preparation time over the
course of the intervention. The baseline preparation time was conducted before
intervention took place.

<u>RQ3. What costs are associated with the choice-making intervention in an average</u>

<u>lesson?</u>

    The estimated cost of the choice-making intervention was collected and graphed each day. Results were recorded on the students' behavior tracking sheet. The data was analyzed to determine the costs associated with the choice-making intervention. The baseline cost was conducted before intervention took place.

RESULTS

RQ1. Does the choice-making intervention reduce self-injurious behaviors when

compared to business-as-usual during the baseline conditions?

Below are six figures demonstrating each participant's behavior during all phases of intervention.
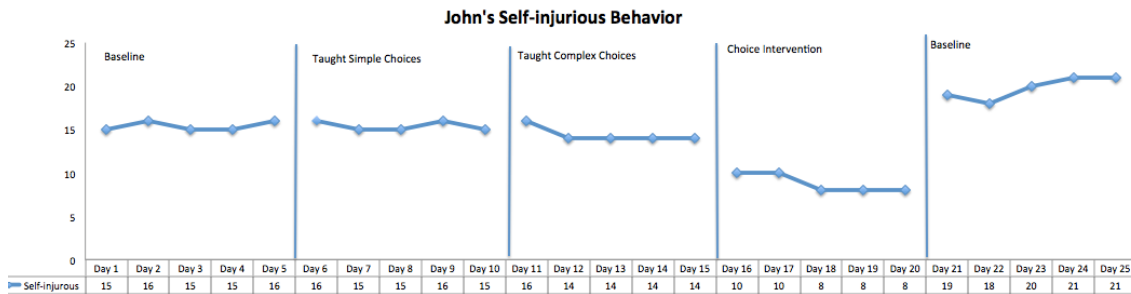
Figure 1-John's Self-Injurious Behavior

During baseline, John ranged from 15-16 self-injurious behaviors, which stayed consistent while John was being taught simple choice-making. When John was taught complex choice-making his self-injurious behaviors went down to 14. Then when John was in the choice-making intervention, his self-injurious behaviors decreased to 10 then to 8. When the choice-making intervention was withdrawn, John exhibited escalated self-injurious behaviors ranging from 19 to 21, which was higher than the original baseline.

Figure 2-Rachel's Self-Injurious Behavior

During baseline, Rachel ranged from 68-71 self-injurious behaviors. Rachel's self-injurious behaviors increased between 70-72 while simple choice-making was being

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taught. When Rachel was taught complex choice-making her self-injurious behaviors went down to 66. Then when Rachel was in choice intervention, her self-injurious behaviors decreased to 65 then to 45. When the choice-making intervention was withdrawn, Rachel exhibited escalated self-injurious behaviors ranging from 71 to 77, which was higher than the original baseline.

Tony's Self-injurious Behaviors

	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10	Day 11	Day 12	Day 13	Day 14	Day 15	Day 16	Day 17	Day 18	Day 19	Day 20	Day 21	Day 22	Day 23	Day 24	Day 25
Self-injurous	10	8	10	12	9	9	9	8	8	6	6	6	6	6	6	5	5	5	5	8	10	10	10	12	10

Figure 3-Tony's Self-Injurious Behavior

During baseline, Tony ranged from 8-12 self-injurious behaviors. Tony's self-injurious behaviors decreased to between 9-6 while simple choice-making was being taught. When Tony was taught complex choice-making his self-injurious behaviors decreased to 6. Then when Tony was in choice-making intervention, his self-injurious behaviors decreased to 5 then increased to 8. When choice intervention was withdrawn, Tony exhibited escalated self-injurious behaviors ranging from 10 to 12.

Liam's Self-injurous Behaviors

|	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10	Day 11	Day 12	Day 13	Day 14	Day 15	Day 16	Day 17	Day 18	Day 19	Day 20	Day 21	Day 22	Day 23	Day 24	Day 25
Self-injurous	7	8	7	7	7	7	8	8	8	7	7	7	7	8	8	6	6	3	3	3	9	12	12	12	12
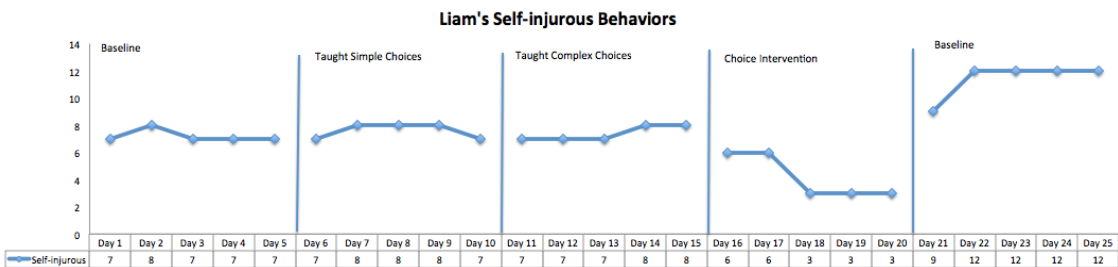
Figure 4-Liam's Self-Injurious Behavior

During baseline, Liam ranged from 7-8 self-injurious behaviors, which stayed consistent while Liam was being taught simple choice-making. When Liam was taught complex choice-making his self-injurious behaviors stayed consistent. Then when Liam was in choice intervention, his self-injurious behaviors decreased to 6 then to 3. When choice intervention was withdrawn, Liam exhibited escalated self-injurious behaviors ranging from 9 to 12, which was higher than the original baseline.
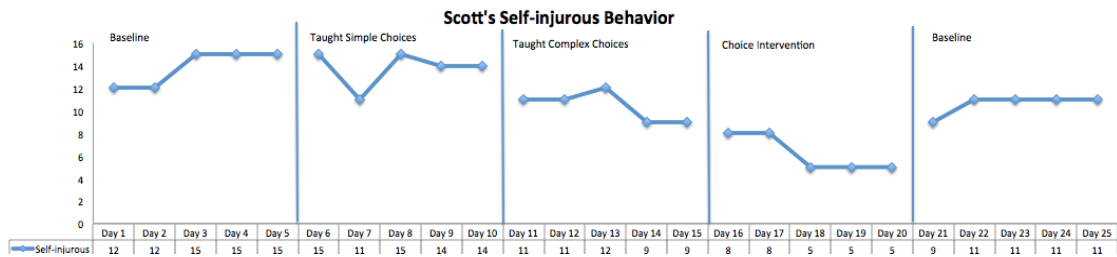
Figure 5-Scott's Self-Injurious Behavior

During baseline, Scott ranged from 12-15 self-injurious behaviors, which stayed consistent while Scott was being taught simple choice-making except one drop to 11 on day 7. When Liam was taught complex choice-making his self-injurious behaviors he decreased between 12-9. Then when Scott was in the choice-making intervention, his self-injurious behaviors decreased to 8 then to 5. When the choice-making intervention was withdrawn, Scott exhibited escalated self-injurious behaviors ranging from 9 to 11, which was lower than the original baseline.
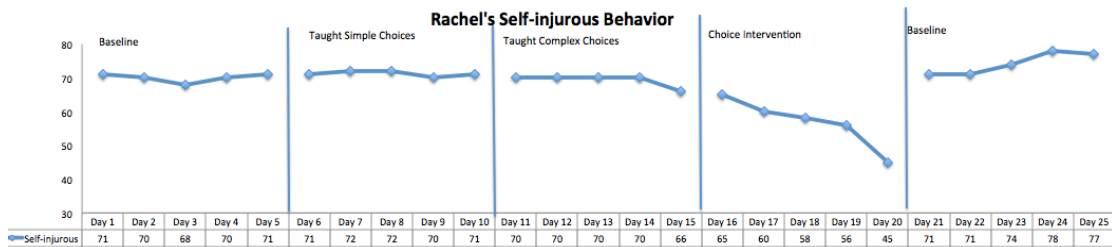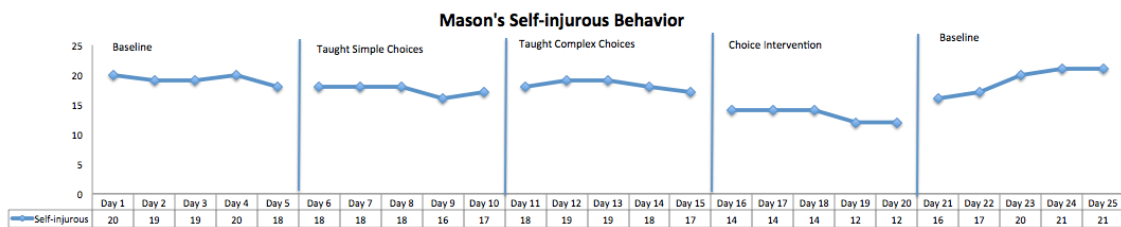

Figure 6-Mason's Self-Injurious Behavior

During baseline, Mason ranged from 18-20 self-injurious behaviors, which stayed consistent while Mason was being taught simple choice-making except one drop to 16 on day 9. When Mason was taught complex choice-making his self-injurious behaviors also stayed consistent. Then when Mason was in choice intervention his self-injurious behaviors decreased to 14 then to 12. When the choice-making intervention was withdrawn, Mason exhibited escalated self-injurious behaviors ranging from 16 to 21, which was consistent to the original baseline.
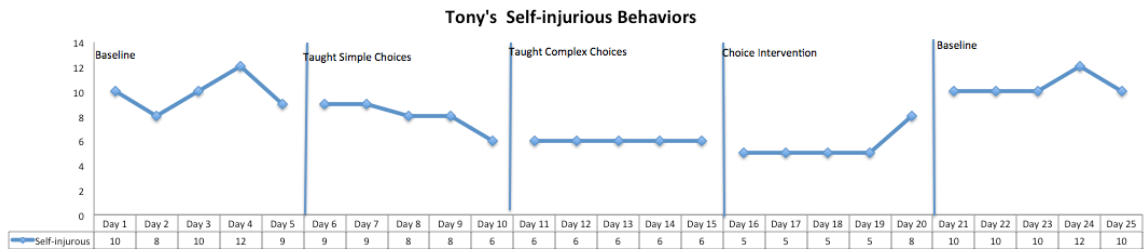
The findings of this study provide preliminary support that there is a benefit derived when using a choice-making intervention with SIB. When examining the above graphs 1-6, notice that the SIB stayed consistent during the baseline phase. When the participants were taught simple and complex choice making during the intervention

phase, a slight decline occurs in graphs 1, 2, 3, 4, and 6 with a significant decline in graph 5. This can be caused by the participants starting to understand how to make their own choices. An analysis of the choice-making intervention graphs indicates that all six participants exhibited a decrease in all SIB in the above graphs. When the choice-making intervention was withdrawn, an immediate increase in SIB was observed.

The findings of this indicate a need for additional time with lesson preparation. During the simple choice-making intervention there was an increase of 10 minutes during preparation time. During the complex choice-making intervention an additional 120 minutes of preparation time occurred. Complex choice-making required an additional 20 minutes of preparation time each day.

	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10	Day 11	Day 12	Day 13	Day 14	Day 15	Day 16	Day 17	Day 18	Day 19	Day 20	Day 21	Day 22	Day 23	Day 24	Day 25
Minutes	30	33	30	32	30	40	42	40	44	44	210	66	65	66	64	66	65	65	67	68	33	30	30	32	33
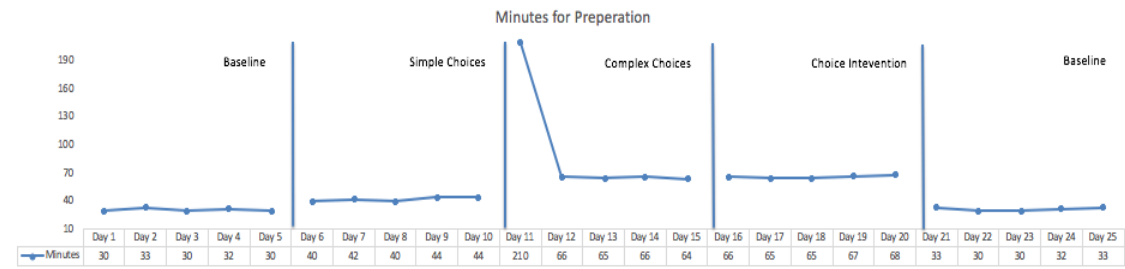
Figure 7- Minutes for Preparation

During the baseline the preparation time was between 30-33 minutes. During simple choice-making the preparation time was between 40-44 minutes, which is an increase of an additional 10 to 11 minutes compared to the baseline. During complex choice-making the preparation time was between 64 and 210 minutes, which is an increase of 180 minutes for the initial setup and 20 to 23 additional minutes compared to the baseline. During the choice-making intervention the preparation time was between 64-68 minutes, which is an increase of an additional 14-15 minutes compared to the baseline. During the

second baseline the preparation time was between 30-33 minutes, which was consistent with the first baseline.

RQ3. What costs are associated with the choice-making intervention in an average lesson?

The cost that is associated with simple choice-making is the cost of materials, which includes ink, paper, clipboards, dry erase markers and erasers, and the writing utensil. The costs associated with complex choice-making was substantially higher than simple choice-making, but additional materials were needed. The material needed for complex choice-making consisted of ink, paper, card stock, poster board, lamination paper, laminator, Velcro (course and soft), clip boards, writing utensils, and dry erase markers and erasers. Figure 8 shows costs associated with implementation.

Cost of Choice-Making Intevention

	Week 1	Week 2	Week 3	Week 4	Week 5
Dollars	5	14	55	7	5
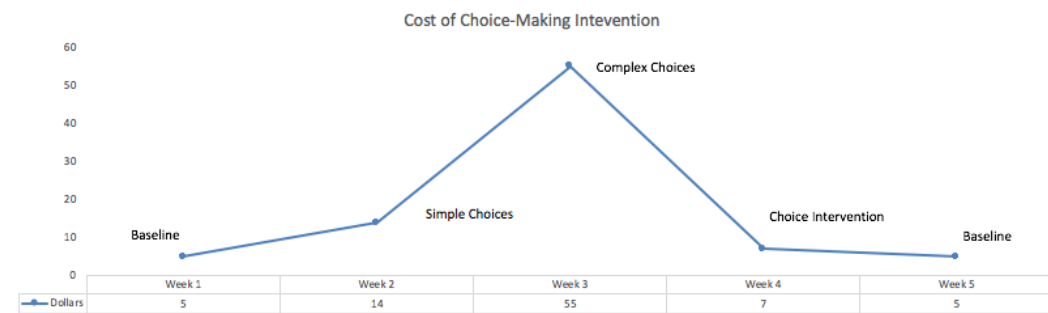
Figure 8- Cost of Choice-Making Intervention

During the baseline week the estimated cost of the lesson was 5 dollars. During the simple-choice-making week the estimated cost was 14 dollars, which is an increase of 9 dollars when compared to the baseline. During the complex choice-making week the estimated cost of the lessons was 55 dollars, which is an increase of 50 dollars when compared to the baseline and an increase of 41 dollars when compared to simple choice-making. During the choice-making intervention the estimated cost was 7 dollars, which is

an increase of 2 dollars compared to the baseline. During the second baseline week the estimated cost was 5 dollars, which is consistent with the first baseline.

DISCUSSION

Research has indicated that choice-making can be effective for students with severe disabilities. Unfortunately, there has been limited research that examines the effectiveness of choice-making across eight domains (i.e., 1. mathematics, 2. time management, 3. money management, 4. personal information such as name, phone number, and address, 5. sight word recognition, 6. matching skills, 7. science, and 8. social studies). This intervention focused on these eight domains. The research indicated that using choice-making interventions across content areas can facilitate behavioral change in students with severe disabilities.

The purpose of this intervention was to help improve the quality of life for individuals with severe disabilities by increasing choice-making opportunities and reducing SIB, which is critical for improving the quality of life. Individual participants may benefit from the procedural nature of the choice-making curriculum. The intervention may help students with severe disabilities make complex choices by prioritizing their desires and rank-ordering their choices (Francis, Gross, Turnbull, & Turnbull, 2014). The probability of positive outcomes is estimated at 83% (Gross et al., 2012). These benefits are expected to be life-long.

There were three questions that were being asked, 1) Does the choice-making intervention reduce self-injurious behaviors when compared to business-as-usual during the baseline conditions? 2) How much time does choice-making intervention add to the classroom teacher's preparation? 3) What costs are associated with the choice-making

intervention during an average lesson? There was a reduction of SIB in all the participants. In addition, the choice-making intervention did increase preparation time by an additional 10 minutes for simple choice-making and additional 20 minutes during complex choice making. In addition, lesson costs rose for simple and complex choice-making. Simple choice-making had an estimated increase of 9 dollars which is a 280% increase when compared to the baseline. Complex choice-making has an estimated increase of 50 dollars, which is a 1100% increase when compared to the baseline. Choice-making intervention had an estimated increase of 2 dollars, which is a 140% increase when compared to the baseline.

Since this pilot study provides promising results, there should be further research examining the effectiveness of the choice-making curriculum on a larger scale and across a longer timeframe. The impacts of these interventions could be life-long, which could enhance the individual's quality of life.

Freedom to Make Choices

International human rights laws protect a person's ability to decide how they would like to spend their money, where they would like to work, how they select healthcare, and the kinds of relationships they have with other people (Alderson, 2016). Most adults without a disability take freedom of choice for granted (Chernyak, Kushnir, Sullivan, & Wang, 2013). A person with a disability, such as intellectual, developmental, or a mental health disability often do not have the opportunity to make their own choices.

It is often assumed if they were given the opportunity to make their own choices they would not make appropriate choices (Eldeniz Çetin, & Safak, 2017). But a person with disabilities can make their own decisions or choices with the right supports. (autistic advocacy, n.d)

A person with disabilities needs explicit instruction related to the procedures necessary to make their own choices or decisions in life (Wolf & Joannou, 2013). These choices can range from where to live, what to do during the day or night, how to spend their money, and when they might need to see a doctor (Sparks, 2013).

Simple and Complex Choice Making Intervention

Student that have severe disabilities are often put on a structured schedule and told what happens throughout the day (Wolf & Joannou, 2013). They are not given the option to help make the choices that their peers are able to make (Sparks, 2013). This study was conducted to see how giving the students an opportunity to make their own choice in eight domains would help with SIB. This was done by having the participant choose what item they wanted more or what assignment they would rather complete. There was a reduction of SIB. The skill is defined by the participants' ability to identify and select a choice from multiple options (Williams, Ponting, & Ford, 2015). This concept is essential for the participant to work towards complex choice making (Al-Sharif, 2018).

Complex choice making is a critical ability for adults with severe disabilities (Barney & Maughan, 2015). Comprehensive skills in this area will enhance the person's living and goal actualization (Tsatsaroni & Sarakinioti, 2018). Once the participant was able to make a competent simple choice on their preferred item or assignment, they were able to move to more complex choice making. During complex choice making the researcher gave the student a number of assignments that needed to be completed and the participant then had to put them in the order that they would like to complete. This was conducted to determine whether giving the participant the option of assignments would lead to a reduction in SIB. The data strongly support this notion.

Self-Advocacy

Self-advocacy skills and characteristics are extremely important for students with disabilities to have a successful transition from high school to a post-secondary program (Meglemre, 2010). Self-advocacy provides people with the power to control their life outcomes by making decisions and choices for themselves to help make future goals in life (Carter, Lane, Magill, Germer, & Greiner, 2015). Self-advocacy is known to be essential in teaching students with disabilities the skills needed for problem solving and decision-making (Cho, Wehmeyer, & Kingston, 2013). This will allow the person to take control over their fate. To be able to teach a student self-advocacy, you first must teach the student simple choice making (Morrisett, 2015). This study was conducted to help teach choice-making skills as an intervention to reduce problematic behaviors, which will

lead to enhanced levels of self-advocacy (Cuenca-Carlino, Mustian, Allen, & Gilbert, 2016).

<div align="center">Limitations of The Study</div>

There were limitations that should be considered when evaluating the implications of this study. The first limitation was the small sample size. Also, there was only one location where the choice-making curriculum was implemented. Since the study has shown a decrease in SIB, there are grounds for further studies with different participants along with additional research examining whether the effects of the choice-making intervention are transferable across different contexts. For example, will the reduction in SIB in the classroom transfer to an out of school venue?

The second limitation was related to the preparation time. The researcher used a stop watch to record how long it took to complete the preparation. The reason the time is an estimate, is because not everyone works and gathers materials at the same pace. According to the researcher, having an additional 10 minutes for simple choice making, 20 minutes for complex choice-making and choice-making intervention, and an additional 120 minutes for initial setup for complex choice making is definitely worth the time when compared to the decrease in SIB behaviors.

The third limitation was the cost associated with choice intervention was only an estimate. The reason that it was only an estimate is because the price of items can fluctuate from place to place. It also depends on what items are already available. There was a larger start-up cost associated with the intervention. According to the researcher

the increase in cost from 9 dollars with simple choice-making, to 50 dollars for complex

choice-making, and an increase of 2 dollars during choice-making intervention is

definitely worth the cost when compared to the decrease in SIB. The cost could also be

lower if you do not need to buy a laminator and clipboards.

APPENDIX A: IRB LETTER

University of Central Florida Institutional Review Board
Office of Research & Commercialization
12201 Research Parkway, Suite 501
Orlando, Florida 32826-3246
Telephone: 407-823-2901 or 407-882-2276
www.research.ucf.edu/compliance/irb.html

Approval of Human Research

From: **UCF Institutional Review Board #1**
FWA00000351, IRB00001138

To: **Matthew Todd Marino** and Co-PIs: **Melanie Olson**

Date: **September 19, 2018**

Dear Researcher:

On 09/19/2018 the IRB approved the following human participant research until 09/18/2019 inclusive:

Type of Review:	UCF Initial Review Submission Form
	Expedited Review
Project Title:	An analysis of a choice-making curriculum.
Investigator:	Matthew Todd Marino
IRB Number:	SBE-18-14069
Funding Agency:	
Grant Title:	
Research ID:	N/A

The scientific merit of the research was considered during the IRB review. The Continuing Review Application must be submitted 30 days prior to the expiration date for studies that were previously expedited, and 60 days prior to the expiration date for research that was previously reviewed at a convened meeting. Do not make changes to the study (i.e., protocol, methodology, consent form, personnel, site, etc.) before obtaining IRB approval. A Modification Form **cannot** be used to extend the approval period of a study.   All forms may be completed and submitted online at https://iris.research.ucf.edu .

If continuing review approval is not granted before the expiration date of 09/18/2019,
approval of this research expires on that date. When you have completed your research, please submit a Study Closure request in iRIS so that IRB records will be accurate.

Use of the approved, stamped consent document(s) is required. The new form supersedes all previous versions, which are now invalid for further use. Only approved investigators (or other approved key study personnel) may solicit consent for research participation. Participants or their representatives must receive a copy of the consent form(s).

All data, including signed consent forms if applicable, must be retained and secured per protocol for a minimum of five years (six if HIPAA applies) past the completion of this research. Any links to the identification of participants should be maintained and secured per protocol. Additional requirements may be imposed by your funding agency, your department, or other entities. Access to data is limited to authorized individuals listed as key study personnel.

In the conduct of this research, you are responsible to follow the requirements of the Investigator Manual.

This letter is signed by:

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APPENDIX B. DATA TRACKING FORM

Name_____ Week of _____

Notes Section: Please write additional behaviors not listed on this data sheet that are problematic as well as a description of this student's day. DO NOT include names of other students.

MONDAY

Percent ____

7:30	7:45	8:00	8:15	8:30	8:30	8:45	9:00am	9:15	9:30am	9:45	10:00	10:15	10:30	10:45

11:00	11:15	11:30am	11:45	12:00	12:15	12:30	12:45	1:00	1:15pm	1:30pm	1:45pm	2:00	2:15pm	2:30

TUESDAY

Percent ____

7:30	7:45	8:00	8:15	8:30	8:30	8:45	9:00am	9:15	9:30am	9:45	10:00	10:15	10:30	10:45

11:00	11:15	11:30am	11:45	12:00	12:15	12:30	12:45	1:00	1:15pm	1:30pm	1:45pm	2:00	2:15pm	2:30

WEDNESDAY

Percent ____

7:30	7:45	8:00	8:15	8:30	8:30	8:45	9:00am	9:15	9:30am	9:45	10:00	10:15	10:30	10:45

11:00	11:15	11:30am	11:45	12:00	12:15	12:30	12:45	1:00	1:15pm	1:30pm	1:45pm	2:00	2:15pm	2:30

THURSDAY

Percent ____

7:30	7:45	8:00	8:15	8:30	8:30	8:45	9:00am	9:15	9:30am	9:45	10:00	10:15	10:30	10:45

11:00	11:15	11:30am	11:45	12:00	12:15	12:30	12:45	1:00	1:15pm	1:30pm	1:45pm	2:00	2:15pm	2:30

FRIDAY

Percent ____

7:30	7:45	8:00	8:15	8:30	8:30	8:45	9:00am	9:15	9:30am	9:45	10:00	10:15	10:30	10:45

11:00	11:15	11:30am	11:45	12:00	12:15	12:30	12:45	1:00	1:15pm	1:30pm	1:45pm	2:00	2:15pm	2:30

P = Physical Aggression   V = Verbal Aggression   PD = Property Disruption   E = Elopement   IS = Inappropriate Social   C = Classroom Disruption   R = Restrained
Physical Aggression — Any instance or attempt of hitting with an open hand or closed, kicking, spitting, slapping, pinching, biting, elbowing, headbutting, regardless of function.
Verbal Aggression — Any instance of student yelling at, screaming at, cursing at, threatening with or without gestures (balled up fists), at a teacher, school staff, or student
Property Disruption — Any instance or attempt of flipping tables, kicking walls or other objects, throwing chairs or items, tearing items off walls, destroying instructional materials, knocking items off tables, etc.
Elopement — Any instance or attempt at leaving the instructional setting without permission of staff.
Inappropriate Social — Any instance of a student discussing inappropriate topics (sexual, violence, drugs), invading others personal space, touching others with hands or feet, making inappropriate gestures, instigating others (teasing)etc.
Classroom Disruption — includes refusal to participate in academic demands.

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