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Use of behavior strategies in speech-language therapy: A survey of Virginia school based speech-language pathologists

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Use of Behavior Strategies in Speech-Language Therapy

A Survey of Virginia School Based Speech-Language Pathologists

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An Honors College Project Presented to

the Faculty of the Undergraduate

College of Health and Behavioral Studies

James Madison University

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by Gillian Sage Withers

May 2018

Accepted by the faculty of the Department of Communication Sciences and Disorders, James Madison University, in partial fulfillment of the requirements for the Honors College.

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PUBLIC PRESENTATION

This work is accepted for presentation, in part or in full, at the James Madison University Honors College Symposium on April 18th, 2018.

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Abstract

In the public schools, Speech-Language Pathologists (SLPs) serve as clinicians to children with various language, articulation, and communication disorders. Often times, these conditions are present in children who also have disruptive or inattentive behaviors. SLPs in the school system are required to provide effective treatment to each child; however, too often the effectiveness of treatment is hindered by behavior outbursts from the children. Although there are empirically supported plans and strategies for behavior management in general elementary school classrooms, little is known about the knowledge and implementation practices of SLPs who serve school-age children. The purpose of this honors thesis was to examine graduate student and practicing SLP knowledge and implementation of nine behavior management strategies through dissemination of a survey. The strategies examined were- Differential Reinforcement, Token Reinforcement, Antecedent Based Intervention, Response Interruption/Redirection, Prompting, Operant Reinforcement Schedules, Functional Communication Training, Prompt Fading, and Time Delay. The participants included 33 graduate students and 35 school-based SLPs. Results showed 100% of practicing SLPs serve students with behavior issues. The first year students reported less knowledge than the second year students who reported less knowledge than the practicing SLPs for every strategy except prompt fading and time delay. Implications for training and future research are also discussed.

Introduction

In the elementary school system, Speech-Language Pathologists (SLPs) provide prevention, assessment, and intervention to students referred to them (ASHA Roles; Ehren, 1993). At the beginning of every school year, SLPs compile a list of all the students they must provide services to and then schedule children in individual or group sessions. For example, a group of three children may attend therapy together on Monday, Wednesday, and Friday each week from 2:20-3:00. When creating this schedule, the SLP must ensure that the times that are chosen meet the needs of the children, their Individualized Education Program (IEP) goals, and their homeroom teacher. SLPs face a variety of barriers to effective therapy. On top of large caseloads, copious amounts of paperwork, and scheduling conflicts (Mayne 2010; Du, 2016; ASHA Roles, 2016), there is also the most unpredictable variable: the children themselves. One of the challenges to serving school-age children is that in addition to their communication diagnosis, some of these children also exhibit behavioral and emotional and mental health problems (Hollo, 2012; Charman, Ricketts, Dockrell, Lindsay, & Palikara, 2014). This comorbidity of symptoms sometimes leads to a variety of complications when trying to provide effective treatment. Ranging from aggressive behaviors, talking out of turn, or physical disruptions (such as hitting peers), these behavior problems may make sessions less effective with decreased teaching time while the SLP responds to the problem behavior.

Moreover, the majority of all SLPs in the schools have children with Autism Spectrum Disorders (ASD) on their caseload and many children with ASD require specialized behavior plans (Schwartz & Drager, 2008). As such, it is important that SLPs know about and have the confidence to implement evidence-based behavior management strategies.

The American Speech-Language-Hearing Association (ASHA) sets standards and implementation procedures for the Certificate of Clinical Competency in Speech-Language Pathology. These standards range from requirements of the degree acquired and knowledge outcomes to how to maintain certification. In the knowledge outcome section, the only mention of behavior is regarding students understanding the social aspects of behavior "including challenging behavior"; however, the skills outcome section states that SLPs should be able to administer appropriate evaluation procedures such as "behavioral observations" (ASHA Council).

The purpose of this study was to examine: a) knowledge about nine behavior management strategies, b) implementation of the nine strategies, and c) confidence in one's skills to implement each of the nine strategies. In addition, to surveying school-based SLPs, this project surveyed first and second year JMU graduate Communication Sciences and Disorders students to see what kind of experience they have with behavior management. While the intended audience of this project is initially the JMU Honors College, the ultimate goal is to inform the training of future SLPs in appropriate behavior management strategies.

Background

In the field of speech-language pathology, there is an abundance of literature regarding evidence-based intervention strategies for children with language, articulation, and communication disorders; however, limited information is available about the behavior management strategies that SLPs implement in individual group settings. Both the classroom teacher and the SLP share responsibility for a student's success, provide lesson plans for teaching information, and are key in the language learning process. The SLP and special education and regular education teachers work in an Individualized Education Program (IEP) team together with the parents of each child to create achievable goals for the child (Ehren, 2000). Since SLPs working in schools and teachers share similar roles and work with the same students, the information in the field of education regarding behavior management may apply to SLPs.

Theoretical Framework

Early behavior plans in the field of education were not officially created until 1997 when the Individuals with Disabilities Education Act (IDEA) added two amendments that applied functional behavioral assessment (FBA) and positive behavior support (PBS) in schools (105 Cong). An FBA serves as a systematic way to identify the problem behaviors of a child, why they are occurring, and come up with a plan to help decrease their occurrences. PBS uses positive behavioral interventions to make behaviors socially appropriate (Sugai et. al, 2000). In a PBS intervention plan, one of the most common supports used is the concept of reinforcement. Reinforcement was identified by B.F Skinner in 1968 and refers to the things in a person's environment that affect and cause him to either repeat or stop a behavior (Hannum, n.d. Ferster, Skinner, 1957). This concept is applied in classrooms nationwide through a variety of positive

behavior support methods used to encourage students to improve their behavior. Teachers are encouraged to use praise to show their approval, group contingencies to establish a goal for a whole class's performance, a good behavior game to use interdependent group goals, a mystery motivator to encourage their students to demonstrate good behavior in the classroom, or the Premack Principle to use activities as incentive (Vanderbilt, n.d.). The Premack Principle deals with controlling behavior by replacing an undesired behavior by using a more desired behavior as its reward (Homme et al., 1963). For example, if a student loves to read but does not enjoy doing his science work the teacher can reinforce him by rewarding him for doing his science work with ten extra minutes of free reading time. These concepts of reinforcing behavior are very common in both the fields of psychology and education, but they are not required knowledge in the field of speech-language therapy (ASHA Council, 2013).

Although there is limited information in the field of speech-language pathology regarding behavior management plans, many of the intervention strategies that SLPs do use are identical or similar to those implemented by trained Applied Behavior Analysis (ABA) professionals in the field of psychology (Mulac, 1977). ABA is an approach to analyzing behavior. It is typically used with individuals with ASD; however, it is useful for behavior management in general (Cooper, Heron, Heward, 2008). Discrete trial training (DTT) and pivotal response training (PRT) will be described to illustrate two main ABA techniques that may be implemented by SLPs in their language intervention (Donaldson & Stahmer, 2014).

Traditional ABA Approach: Discrete Trial Training (DTT)

DTT involves four main components: presentation of a stimulus, the child's behavior/response, a consequence to the behavior, and a pause before the next trial (Buckmann, 1997). This model is used frequently with children with ASD and also in speech-language

therapy. For example, when an intervention is focusing on expressive vocabulary, an SLP might point at an object and ask a child to label it (presentation). The child then labels it (behavior). The SLP then responds with either encouragement and reinforcement or a correction and then pauses before asking the child to label another object (Donaldson & Stahmer, 2014). Often the reinforcement or reward system used in response to DTT is a token economy, which is used very commonly in the schools. A token economy uses some sort of physical item, like stickers on a chart, to keep track of progress using token reinforcement. For example, a child has a chart and once they reach 8 stickers in a row they are able to get a prize.

Naturalistic ABA Interventions and Strategies

  Pivotal Response Training (PRT). PRT involves teaching through context and social interactions (Koegel, Koegel, Harrower, & Carter, 1999). It involves three behaviors: motivation to respond, initiation, and responsivity to multiple cues. When teaching expressive vocabulary, an SLP uses the target word when playing with the child—for example, a puzzle with lots of animals. SLPs help a child put together a puzzle and as they pick up pieces with different animals, they can narrate their actions. For example, "That's a cat. Where do you think we can put the cat? What kinds of sounds does a cat make?" PRT uses the four-step component of DTT to teach a child using familiar activities. SLPs use these components in therapy but it is called Mileu teaching (Donaldson & Stahmer, 2014). By using prompting, SLPs use a cue or prompt to increase the probability of learning a certain behavior. The main way of varying prompt schedules is prompt fading. Prompt fading uses a systematic approach to gradually reduce the number and type of prompts used. Time delay is purposeful waiting for the child to respond before providing verbal or visual prompt in order to reduce prompt dependency. It is used for

children capable of producing a spontaneous response. PRT helps children with ASD replace disruptive behaviors with appropriate language use across contexts (Kientz et. al, 2007).

Antecedent Based Intervention. This type of behavior management strategy involves modifying the environment before a behavior occurs to change the conditions and prevent the learner from engaging in an interfering behavior (The National Professional Development Center on Autism Spectrum Disorders [NPDC], 2018). An example of this strategy can be found in the Positive Behavior Support system (PBS). PBS is a four step process based on the idea that all behaviors can be predicted, and thus prevented. The first step is predicting, more specifically predicting which students in the classroom will struggle or even fail. The second step is prevention by developing rules, routines, and physical arrangements to prevent the students from struggling. This step uses antecedent-based intervention to modify the environment to prevent a certain behavior. The next step is consistency; this is when the new strategies are implemented in the classroom. And finally, the last step is evaluation through collecting data about the success in the classroom. This study used a case study design to evaluate PBS on a large scale design. Researchers found that it is possible to predict problem behaviors based on the circumstance, and by adding more routine into a classroom, children's disruptive behaviors decreased (Scott et al., 2007).

Differential Reinforcement. Differential Reinforcement delivers reinforcement upon the occurrence of a certain desirable behavior and withholds reinforcement when problem behaviors are exhibited (NPDC, 2018). In other words, undesirable behaviors are ignored. One problem that has demonstrated the effectiveness of this strategy is the Praise Note System. The Praise Note System uses reinforcement in the form of sticky notes randomly given to students demonstrating good behavior. For example, a multiple baseline design study examined the

effectiveness of the praise note system to reduce three problematic lunchroom behaviors in an elementary school. They found that with the use of differential reinforcement there was a large decrease in undesirable behaviors of littering, inappropriate sitting, and running (Wheatley et al., 2009). At the same time, increases were seen in appropriate sitting, keeping the lunchroom clean, and walking in the lunchroom.

Operant Reinforcement. Another type of reinforcement, Operant Reinforcement Schedules, use either a fixed ratio, variable ratio, fixed interval, or variable interval to deliver reinforcement. A fixed ratio involves delivering reinforcement every n responses where the ratio gradually increases over time. For example, an SLP gives a student a piece for their puzzle each time they say 3 words with the target sound and the response rate is gradually increased. Variable ratio delivers the reinforcement every n responses where n varies each time. From the previous example, sometimes the child gets a puzzle piece after saying their sound 3 times and sometimes they get a piece after 5 times. Fixed interval delivers reinforcement when t amount of time passes after a behavior is exhibited where t remains constant. For example, an SLP sets a timer and each time the child works for 3 minutes they receive a sticker for their chart. Variable interval delivers reinforcement when t amount of time passes after a behavior is exhibited where t randomly changes (NPDC, 2018). From the previous example, the SLP gives a sticker after random intervals of the child working hard, sometimes it's 3 minutes, other times it's longer.

Response Interruption/Redirection. When a child has an undesirable behavior it is also advisable to use response interruption/redirection. This strategy uses the interruption of an interfering behavior and then redirection to a desired behavior (NPDC, 2018). For example, for a child that bangs their head on the wall, a pillow is placed between the head and the wall and then

the child distracted by another activity. An SLP can use this strategy similarly to help students that struggle with particularly stereotypic or self-harming behaviors.

Functional Communication Training. Functional communication training, as opposed to Response Interruption/Redirection, is an antecedent replacement behavior management strategy. It teaches a new communicative behavior to replace an interfering behavior in the hopes that the child gradually stops using the interfering behavior (NPDC, 2018). For example, an SLP has a student that yells to get their teacher's attention. The SLP could use Functional Communication Training to teach the student to walk over and tap the teacher on the shoulder and sign "all done" so that the next time they are finished they don't disrupt the entire class.

Research Questions

There is a lack of information on SLPs' knowledge and confidence in implementing appropriate management strategies with the children on their caseload. This honors project used ABA framework and everyday language familiar to SLPs to survey and collect data on the types of behavior strategies used in speech-language therapy classrooms. The purpose was to specifically examine the knowledge, implementation, and confidence in implementation of nine specific behavior management strategies. The researcher gathered information for the survey questions from previous studies and behavior information from the field of psychology and education. Regarding the limitations of this study, the project did not "solve" the question of the most effective behavior management plan for a speech classroom but rather begins the scholarly conversation and ultimately makes a recommendation for future research.

Methods

Participants

This study was approved by the James Madison University Institutional Review Board prior to subject recruitment. The project includes a survey of school based SLPs in Virginia regarding their knowledge of behavior management and the strategies they are currently implementing in the schools. By contacting the Virginia Board of Education representative, the researcher obtained an email list of all the school SLPs in Virginia. The researcher and her advisor then created a pilot survey to be advised by their readers and to test it with a small selection of school-based SLP that the researcher already knows. The pilot survey aided the researcher in understanding whether the survey questions asked what she intended them to ask. An email invitation to participate in the survey was sent to 25 first year and 34 second year graduate students in communication sciences and disorders at James Madison University and 138 lead SLPs employed by the Virginia Department of Education who were asked to share the invitation with their SLP colleagues. The final number of respondents included 15 first year graduate students, 18 second year graduate students, and 35 practicing SLPs.

Survey Description

The survey consisted of a knowledge and skills section and a demographic section. The survey was created on a secured Qualtrics account. The first question in the knowledge and skills section asked participants to provide an open response about how they managed children's behavior. Next, participants were asked questions regarding knowledge, implementation, and confidence in implementation of nine behavior management strategies including: Differential Reinforcement, Token Reinforcement, Antecedent Based Intervention, Response Interruption/Redirection, Prompting, Operant Reinforcement Schedule Functional

Communication Training, Prompt Fading, and Time Delay. At the end of the survey, participants received a handout with a description of each of the strategies (Appendix C).

In order to gain a greater understanding of who the participants were, demographic questions were asked. This section included demographic questions regarding information about number of years of practice, caseload size and composition, and how knowledge about behavior management strategies was acquired. The demographic section appeared at the end of the survey so that participants felt a sense of anonymity while answering knowledge based questions at the beginning.

For each strategy, participants were asked to respond to a knowledge statement such as "I know what differential reinforcement is." The response format for these knowledge questions included a 4 point Likert scale consisting of *strongly agree*, *agree*, *disagree*, and *strongly disagree*. When participants selected *strongly agree* or *agree*, a statement about implementation followed (e.g., I implement differential reinforcement with my students). The next statement focused on confidence of implementation (e.g., I feel confident about my skills for implementing differential reinforcement."). Participants who selected *disagree* or *strongly disagree* indicating limited knowledge for a particular strategy did not see the implementation and confidence statements. Before asking participants about antecedent based intervention, they were asked questions about whether they modify the environment, and if so whether it is before, during, or after the behavior. This question was asked in order to gauge the participants' knowledge of antecedent based intervention without the official terminology used. Finally, a free response question was asked about how the participant fades prompts and a general question about what kinds of things they do to manage children's behavior.

Coding Procedures

The survey contained a free response regarding how participants manage behavior. These responses were coded by consensus based on established definitions by the researcher.

1. **Reinforcement (Positive/Verbal Praise)** ~ encouraging a positive behavior by drawing attention to it and providing praise
2. **Visual Supports/Schedules** ~ any number of visual resources for students including but not limited to behavior charts, picture schedules, and visibly posted reminders
3. **Token Reinforcement** ~ individuals earn tokens by performing any of a number of different desired behaviors that are later exchanged for a variety of reinforcers
4. **Modeling/Setting Clear Expectations** ~ individuals learn expectations from modeling and clear verbal or written instructions
5. **Response Interruption/Redirection** ~ interrupting an interfering behavior and then redirecting the learner to a more desired behavior
6. **Take a break** ~ stopping the current activity to give the individual a moment to calm down
7. **Choices** ~ providing the individual with the opportunity to choose the next activity or reward
8. **Antecedent-based Intervention** ~ using environmental modifications to change the setting that prompt an individual to engage in an interfering behavior
9. **Preference Assessment** ~ an assessment used to identify an individual's personal preferences for an object, activities, or people
10. **De-escalation** ~ an approach to conflict management that involves taking a student's behavior and minimizing it to something more productive

The researcher went through each free response and indicated whether one or more of the ten established management strategies was indicated in a participant's response. Each response was then checked and agreed upon by the researcher's advisor. The survey also contained a free response regarding the ways in which participants fade prompts. These responses were coded from MacDuff, Krantz, and McClannahan's "Prompts and Prompt-Fading Strategies for People with Autism" (MacDuff et al., 2001).

1. **Increasing Assistance (Least to Most Prompts)** ~ "When using increasing assistance, the instructor provides a sequence of prompts that begins with minimal assistance and progresses to more assistance. Increasing assistance is provided until the student makes a correct response."

2.   **Decreasing Assistance (Most to Least Prompts)** ~"Learners receive whatever prompts they need to successfully perform a new skill when instruction begins. Over successive teaching trials, the amount of assistance is gradually reduced until no prompts are provided."

3.   **Delayed Prompts**~ "Fades prompts by imposing a brief period of time between the presentation of the naturally occurring stimulus that should ultimately control behavior and the delivery of a prompt."

4.   **Graduated Guidance**~ "The instructor provides manual prompt to complete an action, and then fades these prompts by changing their intensity or location."

5.   **Stimulus Fading**~ "Procedures exaggerate some physical dimension (e.g., color, size, intensity) of a relevant stimulus to help a person make a correct response. The exaggerated feature is the prompt, which is gradually faded or reduced in order to transfer stimulus control from the prompt to the stimulus that will ultimately control the behavior of interest."

6.   **Stimulus Shaping**~ "The physical characteristics of stimuli used in teaching are gradually changed."

Similarly to the first free response, the researcher indicated whether each response contained one or more of the six types of prompt fading. The researcher's advisor reviewed each choice and they agreed upon each decision.

Analysis Procedures

Quantitative data collected from the survey was analyzed for frequency of response for each participant group (first year graduate student, second year graduate student, and practicing SLP). Pairwise comparisons between the groups was analyzed use a chi square test for significance. A significance level of 0.05 was accepted.

<center>**Results**</center>

Demographic Questions

   Graduate Students. The majority of the graduate students surveyed were

communication sciences and disorders majors during their undergraduate career. Other majors

included psychology and linguistics. Eighty-five percent of graduate students completed

observation hours in the schools, 73% in the university clinic, and 42% in early intervention.

Table 1
Graduate students' experience observing

School	Early Intervention	Nursing Home/ Assistive Living	Hospital/ Other Medical	University Clinic	Private Practice Clinic	Other
85%	42%	24%	61%	73%	39%	6%

Unsurprisingly, the majority of graduate students had experience serving children in school

settings and children or adults in a university clinic environment.

Table 2
Graduate students' experience practicing

School	Early Intervention	Nursing Home/ Assistive Living	Hospital/ Other Medical	University Clinic	Private Practice Clinic	Other
70%	9%	6%	36%	70%	9%	9%

Overall, graduate students reported receiving behavior management information from a variety

of sources with the most common being CSD/Speech Pathology courses, (Ex) Education courses,

and observation.

Table 3

Locations where graduate students received behavioral information

Psychology Course	(Ex) Education Course	CSD/ Speech Pathology Course	Observation	Other
52%	64%	73%	58%	18%

Practicing SLPs. One hundred percent of practicing SLPs indicated that they serve

students with behavior issues. The majority of SLPs surveyed have been providing speech-

language therapy services in the schools for over 16 years (Table E5).

Table 4
SLPs' length of time practicing

1-5 years	6-10 years	11-15 years	16+ years
11	4	4	17

The average caseload size was 43 students per week and the majority indicated that they serve

students at the preschool or elementary school level.

Table 5
SLPs' levels served

Preschool	Elementary School	Middle School	High School
80%	97%	37%	37%

Knowledge Questions

As expected, the first-year students reported less knowledge than the second-year

students for all behavior management strategies. The second year students reported knowing less

than the practicing SLPs for every strategy except for prompt fading and time delay. Their

ranking of strategies are shown below.

Table 6
Percentage of participants who selected 'strongly agree' or 'agree' for each knowledge statement.

First Year Graduate Students (n=15)

Differential Reinforcement	Token Reinforcement	Antecedent Based Intervention	Response Interruption/ Redirection	Prompting	Operant Reinforcement Schedules	Functional Communication Training	Prompt Fading	Time Delay
40%	87%	40%	53%	93%	40%	40%	67%	80%

Second Year Graduate Students (n=18)

Differential Reinforcement	Token Reinforcement	Antecedent Based Intervention	Response Interruption/ Redirection	Prompting	Operant Reinforcement Schedules	Functional Communication Training	Prompt Fading	Time Delay
67%	100%	72%	72%	100%	56%	56%	100%	89%

Practicing SLPs (n=35)

Differential Reinforcement	Token Reinforcement	Antecedent Based Intervention	Response Interruption/ Redirection	Prompting	Operant Reinforcement Schedules	Functional Communication Training	Prompt Fading	Time Delay
54%	100%	74%	74%	100%	69%	74%	97%	74%

Differences across the three groups were examined using a chi-square test with follow-up pairwise comparison when significance was detected (Appendix D). The practicing SLPs reported significantly more knowledge of token reinforcement than the first year graduate students. The influence of caseload composition on knowledge and skills was also examined among the practicing SLP group. The three SLPs who had the most students with ASD on their caseload (ranging between 70%-100% of their caseload) indicated *agree* or *strongly agree* more frequently across all strategies than the three SLPs who reported serving 10% or fewer students with ASD. The SLPs serving primarily children with ASD reported knowledge of 100% of the behavior management strategies while SLPs serving fewer students with ASD reported less knowledge (i.e., range of 40-70% across the strategies).

When the correlation between an SLP's presence in their school's FBA team and their knowledge of the nine behavior strategies was examined, there didn't appear to be any significance.

Implementation Questions

The results from the implementation questions are similar to the knowledge questions. The majority of participants who indicated knowledge of a behavior management strategy also indicated that they implement the strategy and that they were confident in implementing it. Looking at the participants' coded free responses, the most commonly used behavior management strategy coded for all three groups was Reinforcement (Appendix E). First year graduate students also reported using visual supports and token reinforcement to manage behavior. Second year graduate students reported visual supports and token reinforcement along with taking a break. Practicing SLPs reported token reinforcement and modeling/setting clear expectations.

The practicing SLPs reported significantly more confidence in implementation of differential reinforcement than the second year students and selected *agree* or *strongly agree* more frequently for implementation of antecedent based intervention than the first year students. The practicing SLPs also reported significantly more confidence of implementation of antecedent based intervention than both the first and second year graduate students.

In addition to the force response questions, participants were also asked a free response question about how they manage prompts. The most common way that participants indicated fading prompts was through decreasing assistance or when "Learners receive whatever prompts they need to successfully perform a new skill when instruction begins. Over successive teaching

trials, the amount of assistance is gradually reduced until no prompts are provided. (MacDuff et

al., 2001).

Discussion

Explanation of Results

The purpose of this study was to examine graduate student and practicing SLP knowledge and implementation of nine behavior management strategies through dissemination of a survey. The researcher hypothesized that the first year graduate students would know less than the second year graduate students who would know less than the practicing SLPs. This proved true except in the case of the second year students who had more knowledge in prompt fading and time delay than the practicing SLPs. This can most likely be explained by the fact the second year graduate students had just taken a required Autism Spectrum Disorder (ASD) graduate course within the last two months of taking the survey. The information was more readily retrievable to the second year students.

The researcher found that 100% of all surveyed SLPs indicated serving students with behavior issues. This finding affirms this study's overall relevance. Since all of the practicing SLPs have students that require behavior management strategies, it is important to understand what strategies they are using to inform further training and research. The researcher did not intend to analyze correlation between caseload composition and strategy knowledge; however, one trend was observed to emerge through the analysis process. SLPs who serve children with ASD were more likely to report knowledge of all nine strategies. Unsurprisingly, the more experience a participant has implementing behavior management strategies, the more knowledge they have.

Prior to survey distribution, the researcher hypothesized that the presence and participation on a school's FBA team would be associated with higher behavior management strategy knowledge; however, that was not the case. There was no association found.

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Implications for Training

Experience was one of the factors on the survey that was associated with higher levels of behavior management strategy knowledge. Across all three groups, participants reported the least amount of knowledge of differential reinforcement, operant reinforcement schedules, and functional communication training. Differential reinforcement, as defined earlier, is "delivering reinforcement upon the occurrence of a certain desirable behavior." It is possible that the first year graduate students understand and implement this strategy frequently; however, they did not understand the terminology used on the survey. While only 40% of first year graduate students reported knowledge of differential reinforcement on the knowledge questions, 60% of their free responses for how they manage behavior were coded for reinforcement. It is possible these students did not understand the nuanced difference between differential reinforcement and the more general term, reinforcement. It is recommended that future training emphasize differences between the general term reinforcement and the more specific term differential reinforcement and ways to use each of these strategies in therapy sessions.

Operant Reinforcement schedules, defined as "a variety of schedules used to vary the ratio or time between when a learner responds and when they receive feedback," also showed low levels of knowledge in the survey. It is recommended that there be further training at both the graduate school level and through the form of continuing education courses for practicing SLPs. Operant Reinforcement Schedules can be very useful in helping SLPs control the methods in which they deliver reinforcement to their patients and keep track of how they respond to the reinforcement.

The third strategy that had low levels of knowledge was Functional Communication Training (FCT) defined as "an antecedent replacement behavior management strategy that

teaches a new communicative behavior to replace an interfering behavior." Similar to Operant Reinforcement schedules, the researcher recommends further training of FCT at both the graduate school level and for practicing SLPs through the form of continuing education courses. It is important the SLPs understand how to use FCT to help their clients learn communicative strategies to reduce frustration and poor behavior outbursts.

Limitations of Study

Although the researcher received a substantial number of participants in the study, the number of participants is a limitation. Only 60% of first year graduate students and 53% of second year graduate students participated in the survey. The total number of SLPs that received the survey is unknown; however, with only 35 participating it can be assumed that this is only a very small subset.

The survey method itself has a number of limitations. Since participants received an email invitation to participate in the survey, it is possible that only individuals who felt semi-confident in behavior management participated in the survey after seeing the title. The generalizability of these results are limited. The opinions and knowledge of JMU's graduate students in no way represent the opinions and knowledge of other Virginia graduate programs or elsewhere in the United States. Finally, the validity of responses was not examined. Since the knowledge and confidence questions were self-reported, there is no guarantee that the results are 100% accurate. Participants reading the questions may overestimate or underestimate their knowledge and confidence of the skills.

The researcher used a Likert scale on the survey for participants to choose their response. These response choices included- strongly agree, agree, disagree, and strongly disagree. Since

the meaning of the responses are interpreted by each participant, one individual's choice of strongly agree might be similar to another's choice of agree.

Recommendations for Future Research

Several changes to the survey's response choices are recommended. Likert scales should only be used for implementation questions. For example, participants were given the statement "I implement differential reinforcement with my students" and given the choices "strongly agree," "agree," "disagree," or "strongly disagree." Technically, implementation is a yes or no question so the researcher would recommend giving participants just the two choices- "agree" or "disagree."

The purpose of this study was to analyze the knowledge and confidence of specific behavior management strategies of graduate students and practicing SLPs. The researcher recommends future studies into the efficacy of these behavior management strategies in the speech therapy setting in order to advise SLPs on which strategies work best.

Appendix A

Email sent to James Madison University Year One and Year Two Masters in Speech-Language Pathology students

You are being asked to participate in an online survey conducted by Gillian Withers and her advisor, Dr. Geralyn Timler, from James Madison University. This survey intends to gather information related to behavior management strategies in speech therapy.

You are not required to participate in this study; however, if you do, no identifiable data will be grouped with your response.

The survey will take no more than 15-20 minutes of your time and your participation would be much appreciated.
The link to the survey is:
https://goo.gl/BS4J01

Thank you for your time and consideration,
Gillian Withers and Dr. Geralyn Timler

Email sent to Virginia school based Speech-Language Pathologists

Greetings,

My name is Gillian Withers and I am a Senior Honors student working with Dr. Geralyn Timler at James Madison University. We are conducting a research study about the public school SLP's knowledge and skills related to behavior management. I am emailing to ask if you would like to take about 15 minutes to complete a survey for our research project. Participation is completely voluntary and your answers will be anonymous.

If you are interested, please click on the link for the survey: https://goo.gl/BS4J01

If you have any questions, please do not hesitate to contact me (withergs@dukes.jmu.edu) or Dr. Geralyn Timler (timlergr@jmu.edu).

Thank you in advance for your time.

Gillian Withers
Honors Student
James Madison University

Survey Questions

What kinds of things do you do to manage children's behavior?
_____

I know what Differential Reinforcement (DR) is
    -strongly agree
    -agree
    -disagree
    -strongly disagree

I implement DR with my students
    -strongly agree
    -agree
    -disagree
    -strongly disagree

I feel confident about my skills for implementing DR
    -strong agree
    -agree
    -disagree
    -strongly disagree

I know what token reinforcement is
    -strongly agree
    -agree
    -disagree
    -strongly disagree

I implement token reinforcement with my students
    -strongly agree
    -agree
    -disagree
    -strongly disagree

I feel confident about my skills for implementing token reinforcement
    -strong agree
    -agree
    -disagree
    -strongly disagree

Do you modify the environment?
    -Yes
    -No

If yes, do you usually modify the environment before the behavior happens or after it occurs?
    -Before (for example, giving a child the opportunity to make a choice of activity, or alerting them of a change in task)
    -After (for example, giving a sticker to a child as a reward for good behavior)
    -Both before and after (see examples above)

I know what Antecedent- Based Intervention is
- strongly agree
- agree
- disagree
- strongly disagree

I implement Antecedent-Based Intervention with my students
- strongly agree
- agree
- disagree
- strongly disagree

I feel confident about my skills for implementing Antecedent-Based Intervention
- strong agree
- agree
- disagree
- strongly disagree

I know what Response Interruption/Redirection is
- strongly agree
- agree
- disagree
- strongly disagree

I implement Response Interruption/Redirection with my students
- strongly agree
- agree
- disagree
- strongly disagree

I feel confident about my skills for implementing Response Interruption/Redirection
- strong agree
- agree
- disagree
- strongly disagree

I know what Prompting is
- strongly agree
- agree
- disagree
- strongly disagree

I implement Prompting with my students
- strongly agree
- agree
- disagree
- strongly disagree

I feel confident about my skills to implement Prompting
- strong agree
- agree

-disagree
-strongly disagree

I know what Operant Reinforcement Schedule are
-strongly agree
-agree
-disagree
-strongly disagree
I implement Operant Reinforcement Schedules with my students
-strongly agree
-agree
-disagree
-strongly disagree
I feel confident about my skills to implement Operant Reinforcement Schedules
-strong agree
-agree
-disagree
-strongly disagree

I know what Functional Communication Training is
-strongly agree
-agree
-disagree
-strongly disagree
I implement Functional Communication Training with my students
-strongly agree
-agree
-disagree
-strongly disagree
I feel confident about my skills to implement Functional Communication Training
-strong agree
-agree
-disagree
-strongly disagree

Prompt Fading
I know what Prompt Fading is
-strongly agree
-agree
-disagree
-strongly disagree
I implement Prompt Fading with my students
-strongly agree
-agree
-disagree
-strongly disagree

I feel confident about my skills to fade prompts
- -strongly agree
- -agree
- -disagree
- -strongly disagree

What kinds of ways do you fade prompts?
_____

I know what Time Delay is
- -strongly agree
- -agree
- -disagree
- -strongly disagree

I implement Time Delay with my students
- -strongly agree
- -agree
- -disagree
- -strongly disagree

I feel confident about my skills to implement Time Delay
- -strong agree
- -agree
- -disagree
- -strongly disagree

*Do you have any experience with Board Certified Behavior Analysts (BCBA)/Behavior Specialists?
- -yes
- -no

*If so, briefly describe your experience:
_____

Which of the following applies most closely to you?
- -First year graduate student
- -Second year graduate student
- -Practicing SLP

If first year graduate student or second year graduate student:
What was your undergraduate degree?
_____

What experience have you had shadowing or observing speech therapy? Check all that apply.
- -In a school
- -In early intervention
- -In a nursing home/assistive living facility
- -In a hospital or other medical facility

-In the university clinic
-In a private practice clinic
-Other: (list here)

Check below all settings where you, yourself, have provided speech-language assessment and/or therapy services.
-In a school
-In early intervention
-In a nursing home/assistive living facility
-In a hospital or other medical facility
-In the university clinic
-In a private practice clinic
-Other: (list here)

Post graduation where would you like to practice speech therapy? Check all that apply.
-In a school
-In early intervention
-In a nursing home/assistive living facility
-In a hospital or other medical facility
-In the university clinic
-In a private practice clinic
-Other: (list here)

Where have you received information regarding behavior management?
- Psychology course
-(Exceptional) Education course
-Speech Pathology/ Communication Sciences and Disorders course
-Observation
-Other:

How many clients are you seeing each week this semester?
_____

Estimate what percentage of your clients have each of the following diagnosis:
*Table
Rows Diagnosis
Across are the circles
-Autism Spectrum Disorders
0-10%
10-20%
20-30%
30-40%
40-50%
50-60%
60-70%
70-80%
80-90%
90-100%
Developmental Delay
0-10%
10-20%

20-30%
30-40%
40-50%
50-60%
60-70%
70-80%
80-90%
90-100%
Emotional Disability
0-10%
10-20%
20-30%
30-40%
40-50%
50-60%
60-70%
70-80%
80-90%
90-100%
-Intellectual Disability
0-10%
10-20%
20-30%
30-40%
40-50%
50-60%
60-70%
70-80%
80-90%
90-100%
-Learning Disability
0-10%
10-20%
20-30%
30-40%
40-50%
50-60%
60-70%
70-80%
80-90%
90-100%
-Multiple Disabilities
0-10%
10-20%
20-30%
30-40%

40-50%
50-60%
60-70%
70-80%
80-90%
90-100%
-Other Health Impairment
0-10%
10-20%
20-30%
30-40%
40-50%
50-60%
60-70%
70-80%
80-90%
90-100%
-Orthopedic Impairment
0-10%
10-20%
20-30%
30-40%
40-50%
50-60%
60-70%
70-80%
80-90%
90-100%
-Sensory Disabilities
0-10%
10-20%
20-30%
30-40%
40-50%
50-60%
60-70%
70-80%
80-90%
90-100%
-Speech-Language Impairment
0-10%
10-20%
20-30%
30-40%
40-50%
50-60%

60-70%
70-80%
80-90%
90-100%
-Traumatic Brain Injury
0-10%
10-20%
20-30%
30-40%
40-50%
50-60%
60-70%
70-80%
80-90%
90-100%

If practicing SLP:
What state do you practice in?
_____
What was your undergraduate degree?
_____
Does your school/school district have a formal Functional Behavior Assessment (FBA) team?
    -yes
    -no
If yes, are you a part of it?
    -yes
    -no
Highest degree received:
    -Bachelors
    -Masters
Years of professional experience in the schools:
    -1-5 years
    -6-10 years
    -11-15 years
    -16+ years
Check all the levels of students that you serve.
    Preschool level
    Elementary school level
    Middle school level
    High school level
How many students are on your caseload each week?
    _____
Approximate number of students currently on my caseload with behavior issues:
    -0 students
    -1-3 students
    -6-10 students

-11-15 students
-16-20 students
-21-25 students
-26+ students

I completed ___ courses in my undergraduate studies that solely addressed behavior issues and management for children
-0 courses
-1 course
-2 courses
-3 courses
-4 courses
-5+ courses

I completed ___ courses in my graduate studies that solely addressed behavior issues and management for children
-0 courses
-1 course
-2 courses
-3 courses
-4 courses
-5+ courses

I completed ___ courses in my undergraduate studies that addressed behavior issues and management for children in some manner:
-0 course
-1 course
-2 courses
-3 courses
-4 courses
-5+ courses

The courses which addressed behavior issues fell into the following categories (Check all the apply):
-Special education
-Language disorders
-General education
-Speech-pathology with special populations
-Other

I completed ___ courses in my graduate studies that addressed behavior issues and management for children in some manner:
-0 course
-1 course
-2 courses
-3 courses
-4 courses
-5+ courses

The courses which addressed behavior issues fell into the following categories (Check all the apply):
-Special education

-Language disorders
-General education
-Speech-pathology with special populations
-Other

Estimate what percentage of your students have each of the following diagnosis:
*Table
Rows Diagnosis
Across are the circles

-Autism Spectrum Disorders
    0-10%
    10-20%
    20-30%
    30-40%
    40-50%
    50-60%
    60-70%
    70-80%
    80-90%
    90-100%

Developmental Delay
    0-10%
    10-20%
    20-30%
    30-40%
    40-50%
    50-60%
    60-70%
    70-80%
    80-90%
    90-100%

Emotional Disability
    0-10%
    10-20%
    20-30%
    30-40%
    40-50%
    50-60%
    60-70%
    70-80%
    80-90%
    90-100%

-Intellectual Disability
    0-10%
    10-20%
    20-30%
    30-40%

40-50%
50-60%
60-70%
70-80%
80-90%
90-100%
-Learning Disability
0-10%
10-20%
20-30%
30-40%
40-50%
50-60%
60-70%
70-80%
80-90%
90-100%
-Multiple Disabilities
0-10%
10-20%
20-30%
30-40%
40-50%
50-60%
60-70%
70-80%
80-90%
90-100%
-Other Health Impairment
0-10%
10-20%
20-30%
30-40%
40-50%
50-60%
60-70%
70-80%
80-90%
90-100%
-Orthopedic Impairment
0-10%
10-20%
20-30%
30-40%
40-50%
50-60%

60-70%
70-80%
80-90%
90-100%
-Sensory Disabilities
    0-10%
    10-20%
    20-30%
    30-40%
    40-50%
    50-60%
    60-70%
    70-80%
    80-90%
    90-100%
-Speech-Language Impairment
    0-10%
    10-20%
    20-30%
    30-40%
    40-50%
    50-60%
    60-70%
    70-80%
    80-90%
    90-100%
-Traumatic Brain Injury
    0-10%
    10-20%
    20-30%
    30-40%
    40-50%
    50-60%
    60-70%
    70-80%
    80-90%
    90-100

Handout provided at end of survey.

Differential reinforcement- *a behavior technique that is useful for off task aggressive or destructive behavior. It delivers reinforcement upon the occurrence of a certain desirable behavior.*
Token Reinforcement- *each individual can earn tokens by performing any of a number of different desired behaviors and can later exchange these tokens for a variety of reinforcers (ie. a sticker chart)*
Antecedent-Based Intervention- *involves using environmental modifications to change the conditions in the setting that prompt a learner to engage in an interfering behavior (ie. arranging the environment so that specific trigger are no longer present)*
Response Interruption/Redirection- *involves interrupting an interfering behavior that is repetitive, stereotypical or self-injurious and then redirecting the learner to a more desired behavior.*
Prompting- *a type of behavior management that involves using a prompt to increase the probability that the learner will use a target skill correctly.*
Operant Reinforcement Schedules- *4 main schedules- fixed ratio (reinforcement delivered every n responses where the ratio gradually increases), variable ratio (number of required responses not constant from reinforcer to reinforcer), fixed interval (reinforcer depends both on the subject's behavior and the passage of time), variable interval(amount of times that must pass before a reinforcer is stored varies unpredictably from reinforcer to reinforcer*
Functional Communication Training- *used to teach a new, communicative behavior that replaces the interfering behavior, gradually learners stop using the interfering behavior when they realize it is no longer effective*
Time Delay- *purposeful waiting for the child to respond before providing a verbal or visual prompt in order to reduce prompt dependency; for children capable of producing a spontaneous response*
**Prompt Fading- *using a systematic approach to gradually reduce the number and type of prompts used*
More information can be found at http://www.autisminternetmodules.org/

** This strategy was inadvertently omitted from the handout and added after the survey was sent out.

Two-way contingency table significance data with pairwise comparisons.

Question #	Significance Level	Participant Comparison	
Q2 Knowledge of Token Reinforcement	0.164	1:2	0.032*
		2:3	0.076
		1:3	0.809
Q3 Implementation of Differential Reinforcement	0.165	1:2	0.570
		2:3	0.207
		1:3	0.109
Q4 Confidence in Implementation of Differential Reinforcement	0.050*	1:2	0.130
		2:3	0.043*
		1:3	0.360
Q5 Knowledge of Token Reinforcement	0.005**	1:2	0.267
		2:3	0.014*
		1:3	0.016*
Q6 Implementation of Token Reinforcement	0.386	1:2	0.363
		2:3	0.278
		1:3	0.567
Q7 Confidence in Implementation of Token Reinforcement	0.666	1:2	0.879
		2:3	0.447
		1:3	0.282
Q10 Knowledge of Antecedent Based Intervention	0.349	1:2	0.233
		2:3	0.888
		1:3	0.133
Q11 Implementation of Antecedent Based Intervention	0.030*	1:2	0.510
		2:3	0.047
		1:3	0.005**
Q12 Confidence in Implementation of Antecedent Based Intervention	0.009*	1:2	0.738
		2:3	0.005**
		1:3	0.010**
Q13 Knowledge of Response Interruption/Redirection	0.275	1:2	0.391
		2:3	0.526
		1:3	0.125
Q14 Implementation of Response Interruption/Redirection	0.564	1:2	0.651
		2:3	0.631
		1:3	0.313
Q15 Confidence in Implementation of Response Interruption/Redirection	0.096	1:2	0.380
		2:3	0.106
		1:3	0.163
Q16 Knowledge of Prompting	0.086	1:2	0.056
		2:3	0.386

		1:3	0.084
Q17 Implementation of Prompting	0.305	1:2	0.105
		2:3	0.765
		1:3	0.193
Q18 Confidence in Implementation of Prompting	0.197	1:2	0.102
		2:3	0.861
		1:3	0.072
Q19 Knowledge of Operant Reinforcement Schedules	0.359	1:2	0.331
		2:3	0.450
		1:3	0.227
Q20 Implementation of Operant Reinforcement Schedules	0.217	1:2	0.099
		2:3	0.081
		1:3	0.482
Q21 Confidence in Implementation of Operant Reinforcement Schedules	0.483	1:2	0.474
		2:3	0.460
		1:3	0.292
Q22 Knowledge of Functional Communication Training	0.015	1:2	0.455
		2:3	0.003
		1:3	0.042
Q23 Implementation of Functional Communication Training	0.161	1:2	0.334
		2:3	0.151
		1:3	0.254
Q24 Confidence in Functional Communication Training	0.251	1:2	0.233
		2:3	0.171
		1:3	0.326
Q25 Knowledge of Prompt Fading	0.007	1:2	0.032
		2:3	0.230
		1:3	0.024
Q26 Implementation of Prompt Fading	0.005	1:2	0.006
		2:3	0.468
		1:3	0.014
Q27 Confidence in Implementation of Prompt Fading	0.138	1:2	0.190
		2:3	0.542
		1:3	0.044
Q29 Knowledge of Time Delay	0.559	1:2	0.426
		2:3	0.458
		1:3	0.453
Q30 Implementation of Time Delay	0.462	1:2	0.977
		2:3	0.256
		1:3	0.423
Q31 Confidence in Implementation of Time Delay	0.441	1:2	0.676
		2:3	0.426
		1:3	0.251

*Indicates significance level of 0.05 ** Indicates significance level of 0.01*

Free Response Coding Results

Table F1
Free Response- "What kinds of things do you do to manage children's behavior"

Group	Reinfor-cement	Visual Supports	Token Reinforce-ment	Modeling/ Setting Clear Expectat-ions	Response Interruption	Take a Break	Choices	Antece-dent Based Intervent-ion	Preference Assessment
First Year Students	60%	33%	33%	13%	13%	0%	7%	0%	0%
Second Year Students	61%	33%	44%	11%	11%	33%	17%	17%	0%
Practicing SLPs	57%	23%	37%	26%	20%	20%	3%	6%	3%

Table F2
Free Response- "What kinds of ways do you fade prompts?"

Group	Increasing Assistance	Decreasing Assistance	Delayed Prompts	Graduated Guidance	Stimulus Fading	Stimulus Shaping
First Year Students	0%	50%	17%	0%	17%	17%
Second Year Students	0%	50%	36%	0%	50%	14%
Practicing SLPs	0%	45%	10%	3%	26%	16%

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