Increasing Vocal Repertoire in order to Reduce Screaming Behavior in Toddler with Autism

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Abstract

Many children with autism spectrum disorder have language delays and difficulty requesting for what they want. As a result, some of them engage in challenging behaviors. Our participant is a 6 years old child with autism who engaged in screaming when he wanted to have access to edibles. During mand training, we implemented most-to-least prompt procedures, which were faded when our participant mastered the target skill on each level. During the last step of the study, he was able to request, independently, for the edible without engaging in screaming. The results demonstrated the effectiveness of this intervention, as he achieved high percentage of correct requesting independently. Nevertheless, we should implement generalization to ensure that our participant will be able to apply the learned behavior outside of the learning environment and we should implement maintenance to ensure that child will continue to practice the acquired skill over time.

Keywords: Mand training, verbal behavior, prompt, fade, autism spectrum disorder.

Introduction

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder which significantly affects social interaction, verbal and non-verbal communication, expressive and receptive communication. These characteristics vary in degree and intensity from individual to individual. Their characteristics are based on the Diagnostic and Statistical Manual of Mental Disorder (DSM-5) and behavior therapists should appropriately use it in order to better understand ASD, identify lack of skills, and develop and design appropriate treatment plan/programs (Pratt, Hopf, & Larriba-Quest, 2017).

Moreover children on the spectrum often appear unusual stereotyped interest in objects, difficulty in gross and fine motor imitation, have unusual reactions to their senses, and difficulty with changes in their routine. Lastly, they cannot follow instructions and maintain their eye-contact with their peers (Penninngton, Cullinan, Southern, 2014).

All individuals who have been diagnosed with ASD exhibit social-communication impairments. During the first year of life signs of autism include lack of appropriate eye-contact, difficulty and inability to take initiations during conversations with other peers. More specifically, young children with ASD, have difficulty to demonstrate appropriate play skills (e.g., functional cooperative play) with their peers, they are struggling with using body language (e.g., difficulty understanding facial expressions and tone voice), most of the time, they cannot take-turns during conversations and play with other people and they cannot stay on topic during conversations (Pratt, Hopf, & Larriba-Quest, 2017).

It is very important to mention, that children with ASD, often have difficulties with their receptive and expressive language. More specifically, they cannot follow instructions, they are unable to verbally express their feeling, thoughts, and desires. Nevertheless, we should mention that many children on the spectrum are non-verbal and require communicative devices (e.g., augmentative and alternative communication). So, those who are non-verbal

appear language delays, lack of spoken language, and in order to communicate effectively, they often need to use alternative augmentative communication (AAC), such as pictures, sign language, voice output devices. Those who are verbal often appear echolalia (i.e., repeat words, phrases), they use repetitive and/or stereotyped language, and they also may appear immature grammatical and syntactic structure (Pratt, Hopf, & Larriba-Quest, 2017).

Both verbal and non-verbal children face difficulties with following instructions, understanding concepts, interpreting social language (e.g., understanding jokes), and they appear vocabulary delay (Pratt, Hopf, & Larriba-Quest, 2017).

Mand training (i.e., request training) is a form of behavioral training during which behavior therapists use prompts and reinforcements in order to request their preferred items and/or activities. A mand is a unit of language, as defined by Skinner, and it is always controlled by individuals' motivation to use verbal language, sign language, pictures, to have access to their reinforcements (e.g., tangibles, activities, etc.). It is important to mention, that for individuals who are unable to verbally request, we should implement manding procedures, by teaching them alternative communication techniques in order to make them request.

Before mand training, behavior therapists should identify strong reinforcers (e.g., items, activities, foods, drinks), as once we know our individuals' highly preferred items (i.e., reinforcers), we can create opportunities for them to use words (or any other type of communication) to have access to their desired tangible (Russell & Reincke, 2019).

An effective method for teaching a child on the spectrum to communicate effectively is mand training. Mand training is about to teach young kids with ASD to request their wants and needs, independently. This particular training is more than just talking, which means that children with autism can communicate and request for reinforcers verbally, via sign language, using picture exchange communication techniques, or assistive devices (Albert, Carbone, Murray, Hagerty, Sweeny-Kerwin, 2012).

Mand training occurs when the relevant motivating operation (MO) is forceful and the response is free from additional sources of control. Behavior therapists can implement fading, prompting, and differential reinforcement procedures when they want to teach mand. Based on Cooper, Heron, and Heward (2007, pp. 526-547) the behavior therapist should first present the nonverbal stimulus along with an echoic prompt and then differentially reinforce successive approximations to the stimulus with a specific reinforcement. The next step would be to fade the echoic prompt, and the final step would be to fade the nonverbal stimulus in order to bring the response under the control of the MO.

Leung (1994) stated that children with autism spectrum disorder (ASD) had been taught to spontaneously request through a time delay procedure. Based on this intervention, the target item was presented and the trainer (i.e. behavior analyst) prompted the child by immediately modeling the request response. When the response was imitated without any errors, then the prompting was delayed with the time interval being increased over the trials.

Another study, demonstrated the effectiveness of full vocal prompt of the mand and then the fading of the prompting when they wanted to teach children with autism to request for the removal of a stimulus (Shillingsburg, Powell, & Bowen, 2013).

The intervention for our participant was intended to teach him how to appropriately request for a desired edible. When he first initiated behavior therapy services, he was screaming in order to request for preferred edibles. Our goal was to shape his screaming behavior and teach him how to ask for the desired reinforcer more appropriately.

Participant

Mike is a 6-year-old toddler with a diagnosis of ASD. He has been receiving 12 hours per week of therapy on his Intensive Behavior Intervention (IBI) program for the past 3 months.

He can follow simple one-step and two-step instructions, he has basic imitation (i.e. gross motor) and play skills (i.e. Mr. Potato Head), and he is able to emit one-word requests for

actions (i.e. open, move, come). He engages in screaming behavior when he wants to request for highly preferred items (i.e. gummies).

Before the intervention, we informed Mike's parents about our research study and obtained their permission to implement it with their son. Thus, we explained to them the purpose of the study, the procedures that would be used, and how the resulting information would be used and by whom, and then they signed the parental informed consent form.

When Mike wanted to have access to edibles (i.e., gummies) and started screaming, we collected Antecedent – Behavior – Consequences (ABC) data. After the ABC data analysis, we hypothesized that the function of our participant's screaming behavior was to access gummies.

The operational definition of Mike's challenging behavior is the following: the occurrence of a mand involves Mike asking for item when the reinforcer is present, with a whole word or an appropriate verbal approximation.

Example: Mike requests with a whole word or appropriate verbal approximation for the gummy.

Non-example: Mike engages in screaming behavior when he wants to have access to edibles. By teaching our participant to mand, we are replacing his challenging behavior with a socially appropriate mand (Hozella & Ampuero, 2013).

Method

The objective of the program was that Mike would request for an item when the reinforcer was present, with a whole word or an appropriate verbal approximation. The material used for his challenging behavior intervention program was gummies as they were identified as highly preferred items during his preference assessment procedure [*Figure 1*].

A reinforcement assessment (i.e., preference assessment) is a strategy which can be used by clinicians (e.g., behavior therapist, speech pathologists, etc.) in order to identify the items and activities that individuals find reinforcing (i.e., highly preferred). So, these will be the items and activities that clinicians will use with their clients during intervention.

In our study, we implemented paired-choice preference assessment, during which we place two items (stimuli) in front of our participant and we allow him to select one. Once the child played with the selected item, we presented another trial of two other items. So, the items the individual selected most of the time, was our participant's highly preferred item/tangible (Rush, Kurtz, Lieblein, & Chin, 2005).
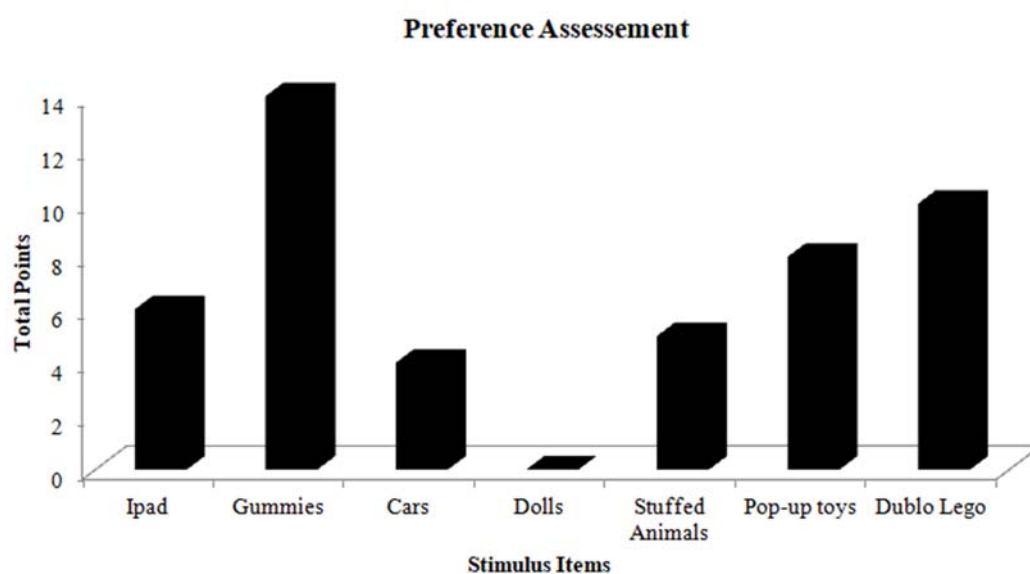

Figure 1. Paired-choice stimulus preference assessment across seven preferred items.

Our mastery criterion was to score 100% for 2 consecutive days or 80% across 3 consecutive days. The behavioral program met revision criteria under the following circumstances; 10 days delay without mastering a step, or when our participant has 5 data points with 40% or lower, or a decreasing trend across 5 data points. When we taught Mike this skill, we avoided to verbally prompt him (e.g. 'What do you want?'), otherwise the child would become a responder rather than an initiator.

Mastery criterion is an important concept in Applied Behavior Analysis (ABA) and in behavioral interventions, as it determines the number of independent (without prompts) correct responses over a number of trials needed for a target skill in order to be considered mastered (i.e., learned). The higher mastery criterion means higher individual's performance. Moreover, mastery criterion focuses on level of performance; total number of responses within a treatment session and frequency of observations; number of consecutive sessions/trials a particular target is observed (Fuller & Fienup, 2018).

During our first step, we contrived motivation for gummy by giving to him a freebie. Then during the second step, once we established that Mike wanted gummies, we hold a second piece of gummy in order to tempt him. Once indication of motivation was established, we prompted him vocally by saying the name of the item (i.e. gummy). We followed this step across several trials until our participant began to echo us right away or with us at the same time. Once this occurred we started giving him only verbal partial prompts. We implemented most to least prompt procedures, and more specifically we started by providing full verbal prompt (FVP). Once he mastered that, we continued with partial verbal prompt (PVP), and during the last step Mike was able to request for gummies independently (IND). For the error correction procedure, if he error and did not make the correct request or did not respond within 3 seconds, we followed the following steps; we provided a full verbal prompt and once he echoed our request, we had to provide him the gummy immediately. Then, the next step was to set up similar situation and to create MO for Mike to request for gummy with less prompting.

Results

We used trial – by - trial data collection procedure during the session. A correct trial consisted of Mike produced a whole word or appropriate verbal approximation to request independently when gummy was in sight. We graphed daily percentage of correct mands and at the same time we recorded our data on a skill tracking form. The changes on his requesting for gummies are interpreted in the graph below [*Figure 2*].
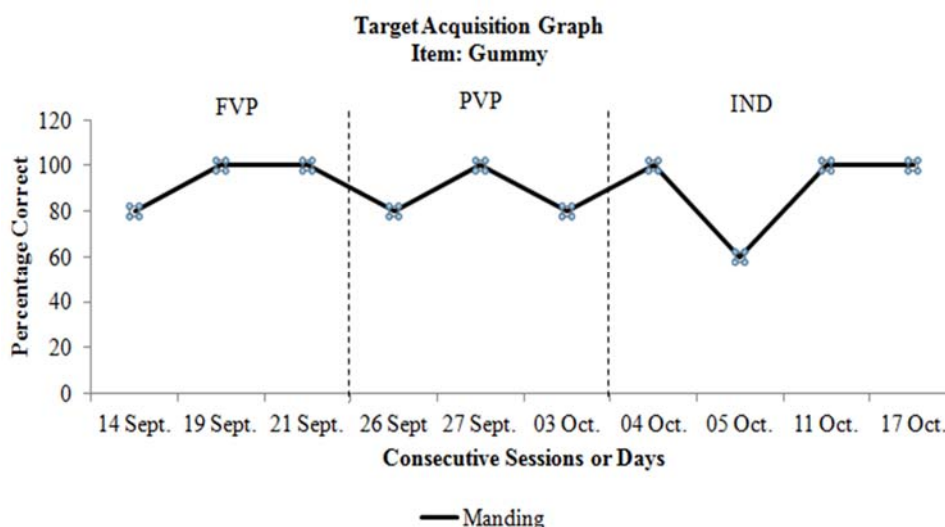

Figure 2. Percentage of Mike's correct responses with manding for the reinforcer (i.e. gummy) across 10 consecutive days.

Changes in the occurrence of the behavior (i.e. manding) during the sessions can be observed. This can be achieved with the visual analysis. For the percentage of correct manding during full verbal prompt procedure, for gummy, Mike achieved high percentage of correct responses during this type of prompting procedure and it is clear that our participant mastered the target with this prompt level after 3 consecutive trials. On *Figure 2*, we revised the prompt level and we introduced less prompting procedure. During partial verbal prompting procedure, Mike continued to achieve high percentage of correct responses. He mastered his target with this prompting level, after 3 consecutive trials. The last step was to fade prompting procedures, so he had to request for his highly preferred item independently. The graph showed that our participant during the first trial achieved high percentage of correct responses, without any prompts, whereas the other day he achieved moderate level of percentage, and it is clear that there is a decrease on the trend between the first and the second trial. After almost a week, there is a significant increase on the percentage and the line goes up to 100%.

Discussion

The present intervention indicated that manding for a present highly preferred item can be implemented with a participant who demonstrates limited manding skills. Mike used to engage in screaming behavior when he wanted to have access to gummies. Our main goal was to eliminate his screaming and replace it with more socially appropriate verbal behavior. Mike was taught to mand for gummies while we provided a full verbal prompt when the item was present. As he mastered this target we faded this prompt procedure and we implemented partial verbal procedure plus the presence of the item. On the final step, we did not provide prompting procedure, and our participant had to verbally and independently request for his reinforcer. The results demonstrated the effectiveness of this intervention as Mike achieved this target goal within less than a month. Several studies used this type of intervention when they wanted to teach manding in children with ASD who were also able to echo. Based on Albert, Carbone, Murray, Hagerty, and Sweeney-Kerwin (2012) vocal prompts and prompt fading are two fundamental and necessary procedures that we can implement when we want to teach manding.

Some of our study's strengths are that we successfully replace a challenging behavior with a more acceptable and socially appropriate behavior. Thus, instead of screaming in order to request for an item, Mike could appropriately and independently ask for what he wanted without engaging in any challenging behavior. Nevertheless, we should consider other variables that may limit the effectiveness of this intervention. It is important to consider that our participant may engage in screaming in the future if his preferred item is out of sight. Moreover, we should frequently assess if Mike is still motivated for this reinforcer. In case where he is not interested anymore, the intervention will be considered as ineffective and he will engage in screaming behavior or any other challenging behavior. When we want to teach manding, it is important to be aware of the MO and ensure that prompts are faded out as quickly as possible to avoid prompt dependency.

Conclusion

At the end of this research study, we identified that there are couple of technical improvements that we should have implemented. Requesting for gummies should have been taught with the help of functional communication training, as the purpose of this procedure is to teach new behaviors and at the same time eliminate challenging behaviors (Fisher & Bouxsein, 2011, pp. 335-369).

As other studies suggested, the next time that we will teach manding we can achieve that with the support of function-based video modeling. Video modeling can be

effectively used with children who had no way to mand for a preferred item and in addition they engaged in challenging behaviors (McCulloch & Noonan, 2013; Plavnick & Ferreri, 2011).

Another technical improvement would be to implement time-delay prompting procedures. More specifically, Halle and his colleagues used 5-seconds time delay to produce manding in children with mental retardation plus language delays (Tincani, Bondy, & Crozier, 2011, pp. 270-280).

Moreover, the importance of verbal behavior in children who have been diagnosed with ASD, and at the same time how significant is our role as behavior therapists as we have to support these children to build their verbal repertoire and make them more independent. And lastly, because mand benefits the speaker, it is very crucial to always assess the tangibles or the actions that function as reinforcers for our learners before we implement the instruction. That means that identify potential highly preferred items (reinforcers), is a crucial step in order to manage challenging behaviors in individuals who have been diagnosed with ASD and developmental disabilities. Without reinforcers it will be very challenging and difficulty for a behavior therapist to change behaviors. By assessing the preferred items, will be able to increase our participants/clients motivation to work for these preferred items/activities, which at the same time will yield a successful improvement and change in their behaviors (DeLeon & Iwata, 1996).

References

Albert, K. M., Carbone, V. J., Murray, D. D., Hagerty, M., & Sweeney-Kerwin, E. J. (2012). Increasing the mand repertoire of children with autism through the use of an interrupted chain procedure. *Behavior Analysis in Practice, 5* (2), 65-76.

Cooper, J. O., Heron, T. E., & Heward, W. L. (2007). Verbal Behavior. In Cooper, J. O., Heron, T. E., & Heward, W. L. (Eds.), *Applied Behavior Analysis* (pp. 526-547). Upper Saddle River, New Jersey: Pearson Prentice Hall.

DeLeon, I. G., & Iwata, B. A. (1996). Evaluation of multiple-stimulus presentation format for assessing reinforcers preferences. *Journal of Applied Behavior Analysis 29,* 519-533.

Fisher, W. W., & Bouxsein, K. (2011). Developing function-based reinforcement procedures for problem behavior. In Fisher, W. W., Piazza, C. C., & Roane, H. S. (Eds.), *Handbook of Applied Behavior Analysis* (pp. 335- 369). New York, NY: The Guilford Press.

Fuller, J. L., & Fienup, D. M. (2018). A Preliminary Analysis of Matery Criterion Level: Effects on Response Maintenance. *Behavior analysis in practice 11* (1), 1-8.

Hozella, W., & Ampuero, M. (2013, July). *Mand Training Basics.* Paper presented at National Autism Conference, Pennsylvania.

Leung, J. P. (1994). Teaching spontaneous requests to children with autism using a time delay procedure with multi-component toys. *Journal of Behavioral Education, 4* (1), 21-31.

McCulloch, E. B., & Noonan, M. J. (2013). Impact of online training videos on the implementation of mand training by three elementary school paraprofessionals. *Education and Training in Autism and Developmental Disabilities, 48* (1), 132-141.

Pennington, M. L., Cullinan, D., & Southern, L. B. (2014). Defining Autism: Variability in State Education Agency Definitions of and Evaluations for Autism Spectrum Disorders. *Autism Research and Treatment,* vol 2014, Article ID 327271, 8 pages.

Plavnick, J. B., & Ferreri, S. J. (2011). Establishing verbal repertoires in children with autism using function-based video modeling. *Journal of Applied Behavior Analysis, 44* (4), 747-766.

Pratt, C., Hopf, R., & Larriba-Quest, K. (2017). Characteristics of individuals with an autism spectrum disorder (ASD). *The Reporter, 21*(17). Retrieved from https://www.iidc.indiana.edu/pages/characteristics

Rush, K. S., Kurtz, P. F., Lieblein, T. L., & Chin, M. D. (2005). The Utility of Paired-Choice Preference Assessment in Predicting Reinforcer Effectiveness for an Infant. *Journal of Early and Intensive Behavior Intervention 2* (4), 247-251.

Russell, S. M., & Reincke, D. (2019). Mand acquisition across different teaching methodologies. *Behavioral Interventions 34* (1), 127-135.

Shillingsburg, M. A., Powell, N. M., & Bowen, C. N. (2013). Teaching children with autism spectrum disorders to mand for the removal of stimuli that prevent access to preferred items. *The Analysis of Verbal Behavior, 29* (1), 51-57.

Tincani, M., Bondy, A., & Crozier, S. (2011). Teaching Verbal Behavior. In Fisher, W. W., Piazza, C. C., & Roane, H. S. (Eds.), *Handbook of Applied Behavior Analysis* (pp. 270- 280). New York, NY: The Guilford Press.