

# The Power of the Mand: Utilizing the Mand Repertoire to Decrease Problem Behavior

Sheila M. Cornelius Habarad

B. F. Skinner Foundation, Cambridge, Massachusetts

The acquisition of a competent manding repertoire can present a challenge for a typically developing child with verbal behavior; it can be even more cumbersome for a child with autism who is effectively vocally nonverbal. Minshawi et al. (2014) recognized that the side effects of language delays, such as self-injurious behavior (SIB), must also be addressed because of the high correlation between SIB and a limited vocal verbal repertoire. The present study examined the relationship between SIB and a manding repertoire with 2 methods of communication. The participant of the present study was a 12-year-old boy who received direct, 1-on-1 Applied Behavior Analysis (ABA) therapy, emphasizing the development of the verbal repertoire. The study focused on 2 goals: establishing an effective manding repertoire while decreasing SIB. The subject began the study using PECS as his primary communication system, adaptive sign language was introduced as a secondary method of communication. The results suggest a correlation between an increased verbal repertoire and the decrease of SIB.

*Keywords:* adaptive sign language, Standard Celeration Chart, verbal behavior

The verbal behavior of an organism comprises different categories of verbal operants based on the stimuli and setting events evoking the response, the response, and the consequence. These elementary verbal operants examined in *Verbal Behavior* (1957) include the mand, the echoic, the tact, and the intraverbal, along with textual categories that include responses such as; textual, transcription, and copying a text all of which are reinforced by the listener. Although all seven operants are relevant to human language development, the mand is the verbal operant considered in this study. Skinner (1957) defines the mand as, “a verbal operant in which the response is reinforced by a characteristic consequence and is therefore under the functional control of relevant conditions of deprivation or aversive stimulation” (pp. 35–36). Sundberg and Michael (2001) enhance the definition of the mand as a response form that is under the control by an establishing operations

or EO, which can be motivative variables such as deprivation, satiation, or aversive stimulation. Even though the other operants are meaningful, they do not provide direct access to desired reinforcers.

In language development the mand is a significant milestone and is the only verbal operant that increases the likelihood that the speaker contacts reinforcement (Sundberg & Michael, 2001). Typically developing children reveal seemingly effortlessly hundreds of mands per day. Children with language delays, often must be explicitly taught individual verbal operants to strengthen their verbal behavior repertoire. Even though the acquisition of the mand is challenging, it is distinguished above the other verbal operants as the first to teach because “the mand gives the child control over the social and, indirectly, the nonsocial environment. This control should increase the value (to the child) of language training in general, which in turn should make the task of the language trainer an easier one” (Sundberg & Michael, 2001).

The acquisition of the mand can be demanding for a child who has verbal behavior, it can be even more cumbersome for the child who is effectively vocally nonverbal, or incapable to talk. Some children diagnosed with autism are

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Correspondence concerning this article should be addressed to Sheila M. Cornelius Habarad, B. F. Skinner Foundation, 18 Brattle Street, Suite 451, Cambridge, MA 02138. E-mail: [scornelius81@msn.com](mailto:scornelius81@msn.com)

considered nonverbal, lacking the ability to communicate vocally (Pickett, Pullara, O'Grady, & Gordon, 2009). For children with autism who are nonverbal, learning to mand can pose a significant challenge for two basic reasons. First, the family has to identify the best alternative method of communication for the child and community. Second, once the family chooses an alternative method, both child and the child's family and caregivers must learn the method. Three common forms of alternative communication include sign language, the Picture Exchange Communication System (PECS), and aided Augmentative and Alternative Communication (AAC) devices.

Beyond these difficult choices, the side effects of language delays, such as self-injurious behavior (SIB), must also be addressed. Minshawi et al., (2014) noted that the literature addressing SIB and autism surmounts any other type of disorder. Further noting the correlation between SIB and the severity of deficit, such as a lack of verbal communication, minimal receptive or expressive communication, significant social deficits and so forth. The research validates further investigation into the correlation between alternative methods of communication and SIB.

The present study examined the relationship between SIB and manding with two methods of communication.

## Method

### Participants and Setting

The participant of the present study was a 12-year-old boy with autism who was nonverbal, incapable of vocally communicating. The subject received direct, one-on-one Applied Behavior Analysis (ABA) therapy, emphasizing the development of the verbal repertoire, 35 to 40 hours of intervention per week in a center-based setting. This study focused on two goals: establishing an effective manding repertoire while decreasing SIB. The subject presented as a kind, compliant, and energetic child. The participant exhibited basic imitative receptive and self-help repertoires. These repertoires required gross and fine-motor skills, with minimal assistance, and self help skills such as dressing and basic toileting. Although PECS was the subject's primary method of communication he

was unable to use the system independently, requiring gestures and physical prompts from the technician (e.g., pointing to his book, guiding his hand to open the book, lightly nudging his elbow to finish the movement-cycle to grasp a specific picture card). During the subject's first week in the study the staff collected data on his usage of verbal operants, motor skills, self-help skills, and self-injurious behavior. Self-injurious behavior (SIB) topographies included moving his open hand and touching the palm of his hand to his head with a force that left a red mark on his skin.

SIB occurred when manding for a desired item or information was under extinction condition. The previous school the subject attended, provided one-on-one ABA services, and his family implemented a working time-out procedure every time he engaged in SIB. During the working time-out procedure the caregiver removed the subject's PECS then delivered 3 to 5 directions (e.g., previously mastered imitative and receptive skills). The subject received his PECS book after responding to the directions, however the higher preferred items removed. The subject received the higher preferred pictures after a period of time passed without SIB. The family insisted the working time-out remain in the subject's daily program at the center. The subject's staff agreed to the family's request contingent upon the data collected.

### Materials

The subject had a medium size communication book that he carried. The communication book transitioned to a small book containing Velcro pictures that he wore around his waist.

### Apparatus

The technicians used tally counters to count the mands and SIB. Staff were trained to use the tally counters and how to track specified behavior. Regular accuracy checks also took place, consisting of an observer and technician tracking the same behavior with tally counters to confirm systematic data collection. The checks occurred at random times across all clients and technicians in the center.

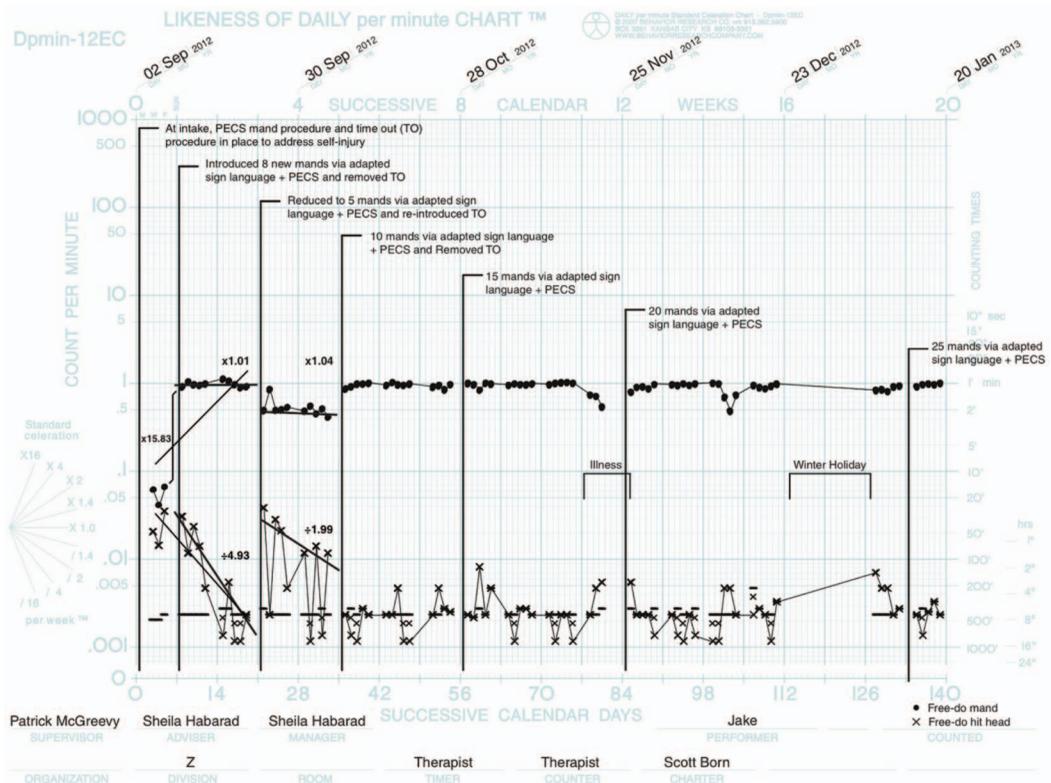


Figure 1. ● = number of mands emitted per minute; x = number of times client hit head per minute.

**Chart**

The technicians graphed the collected data daily on a Standard Celeration Chart (SCC), shown in Figure 1. The SCC displays dots that represent the number of times the client manded per minute and an x to show the number of SIBs the client engaged in per minute. The chart also has a timing floor, the horizontal line near the bottom of the chart representing the total number of hours the client received services per day. Finally, the acceleration line indicates the increase in frequency of the client’s manding per day while the deceleration line shows the decrease in frequency of SIB per day.

**Baseline**

The subject was observed manding for 5 items and activities using his PECS during baseline. He required gestural and physical prompting in order to utilize the remaining 15 pictures

in his PECS. The subject manded one time per 15 to 30 minutes across three days. He also engaged in SIB one time per 35 to 60 minutes per day.

**Procedure**

The procedure differed across the first four conditions shown in Figure 1. The baseline condition consisted of providing the subject free access to items and activities that the subject enjoyed and not yet introduced in PECS. The subject was redirected to his PECS book if he tried to access an item or activity without using the picture. The technician implemented a working time-out when the subject engaged in SIB. The working time-out consisted of the technician removing the communication system from the subject’s view, presenting three to five previously mastered imitation or receptive directions. The subject’s communication system was returned after he completed the tasks. How-

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ever, the two most preferred items were removed from the picture book for a period of 10 to 15 minutes. The subject received access to the higher preferred items after 10 to 15 minutes of following directions and manding without SIB.

The second phase of the study introduced eight adaptive signs as a secondary method of communication along with PECS, his primary communication method. The working time-out was removed and replaced with planned ignoring. The technician placed the SIB on extinction, during planned ignoring, and continued with the task, play or manding.

The third phase returned to baseline, reintroducing the working time-out. The technician reduced the number of signs from eight to five that were reinforced as mands. All mands emitted by the subject with PECS were reinforced. The technician placed the three eliminated signs on extinction.

Finally, the fourth phase removed the working time-out and reinstated planned ignoring. The technicians reinforced all mands emitted using both PECS and the eight signs originally introduced. The subject continued to learn new signs of highly preferred items and activities during this phase.

## Results

The results indicate the correlation between establishing a robust manding repertoire and decreasing the rate of SIB. The second condition shows a rapid deceleration of SIB alongside a significant jump up in the rate of manding supporting this correlation. The third condition reintroduces the working time-out, resulting in the acceleration of SIB while the mands simultaneously decrease from one time every minute to one time every two minutes. Finally, the subject's manding repertoire returns to a rate of one time per minute while SIB decreased to three to zero occurrences per seven to eight hours.

## Discussion

Visual analysis of the graphed data shows that adaptive sign language can be an effective alternative communication method, particularly in cases where fine motor coordination is limited.

The study suggests that increasing the rate of manding, where a child presents a limited manding repertoire, appears to be correlated with decreases of SIB. Future studies could elucidate this relationship.

Although there was a return to baseline condition, a true return to baseline was not possible because of the history of the subject's participation in this program. The subject's manding repertoire continued to grow despite the independent variables.

The baseline data collected pose a potential threat to the validity of this study. Three days of baseline data were collected before the intervention took place. In this study the rate of SIB shows an increase, prompting the investigation of alternative communication methods.

Another potential risk is the lack of interobserver agreement. The center did implement the random accuracy checks described above. However, scheduled interobserver agreement sessions did not take place.

Center-based ABA therapy offers a child with autism a highly controlled environment to learn. Generalizing the study outside of a one-on-one ABA program, emphasizing the development of a verbal repertoire, may be quite an undertaking. This study encourages community and school based efforts to integrate such services.

Current research is being published that is questioning the effectiveness of using sign language as an alternative method of communication for children with autism (Schwartz & Nye, 2006). This is one study that emphasizes the necessity for future research supporting alternative methods of communication, specifically sign language as a communication method for vocally nonverbal children with autism.

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