Teaching Language to a Two-Year-Old with Autism

Shiri Bartman and Nancy Freeman

Abstract

This research examined the rate of communication acquisition of a two-year old girl with autism using the principles of Applied Behaviour Analysis (ABA) with an emphasis on B. F. Skinner's analysis of language. The primary treatment goal was to teach communication by providing as many manding/requesting opportunities as possible through manipulation and control of the environment. The primary communication system was sign language paired with spoken words. Prior to treatment, this girl had no formal system of communication. The speed with which she acquired spontaneous signs leads us to conclude that a language-training program with an emphasis on manding/requesting can be highly efficient and effective in developing functional communication.

Children with autism have severe social-communicative deficits. Those who do not communicate in traditional ways use behaviours that serve to communicate with others in their environment (Freeman, 1993; Freeman, Perry & Bebko, 2002). However, it is essential to teach these children to move from unconventional to more conventional forms of communication (e.g., pictures, signs, or words).

Children who are typically developing, have language that includes a high proportion of requests. Surprisingly, language-training programs for children with developmental delays has generally focussed on tact (labelling) or echoic (repeating) training, failing to emphasize the innate reinforcing power of manding or requesting (Hall & Sundberg, 1987). Skinner (1957) defined the mand as "a verbal operant in which the response is reinforced by a characteristic consequence and is therefore under the control of relevant conditions of deprivation or aversive stimulation" (pp. 35-36). Typical language training focussing on receptive understanding and

the ability to tact or label items teaches the learner to follow directions given by others. This is arguably of little immediate benefit to the learner, and in fact may be argued to be of benefit to the speaker. In contrast, the mand (or request) is the only verbal operant/behaviour that immediately and directly benefits the learner. As a consequence, students seem to be more willing and motivated to participate in language training sessions when being taught to mand/request for specific reinforcement (Sundberg, 1993).

Manding or requesting is defined as being controlled by conditions of deprivation or aversive stimulation called "establishing operations" (Michael, 1982, 1988). Michael (1988) has defined the establishing operation (EO) as "an environmental event that affects an organism by momentarily altering (a) the reinforcing effectiveness of other events and (b) the frequency of occurrence of that part of the organism's repertoire relevant to those events as consequences" (p. 3). That is, establishing operations can be loosely considered to be similar to motivation. In order to use the establishing operations, the reinforcing effectiveness of situations, objects, or events must be captured or contrived. This involves capitalizing on the establishing operations or motivation as it occurs naturally in the environment or manipulating the situation that alters the value of another object or event as a form of reinforcement (Sundberg, 1993).

Another important factor in language training for non-verbal individuals is selecting the optimal system for communication. Michael (1985) has outlined two different types of verbal behaviour. One is called topography-based, which is based on the form or appearance of the communication, and includes both signing and writing. The other is called stimulus-selection-based verbal behaviour, and includes both pointing to and exchanging symbols. The research available is beginning to support a topography-based approach to teaching language, suggesting that students taught using this approach seem to show overall better performance including faster learning (Michael, 1985; Sundberg & Sundberg, 1990; Wraikat, Sundberg & Michael, 1991).

In an effort to extend research on topography based language and mand training to younger children, the current research was designed to examine the effectiveness of this teaching approach on the behavioural intervention program of a nonverbal two-year-old with autism.

Method

Participant

During her initial assessment, a 2-year, 3-month-old girl with autism was found to have the following Vineland Adaptive Behavior Scale Domain age equivalents: Communication 3 months; Social 7 months; Daily Living 8 months; Motor 1 year, 3 months. Her social interaction, communication, and behaviour met the DSM-IV criteria for autistic disorder, and the Childhood Autism Rating Scale (CARS) score fell within the range of autism when completed by two independent observers.

Setting

Language training was conducted at a centre-based program at the Toronto Preschool Autism Service - Surrey Place Centre. Sessions were held every afternoon, and consisted of two and a half hours of direct one-to-one teaching.

Procedure

Three different Instructor Therapists spent the first few sessions pairing (or associating) themselves and the teaching environment with valuable high-density reinforcement. Once initial pairing was successful, the therapists began to fade in language training tasks. A naturalistic approach permitted the child's motivation to determine which mands were targeted. The girl was taught to request preferred items with signs using physical prompting and fading procedures. Three signs were targeted at a time, and were always paired with the corresponding spoken word. The environment was captured and contrived so that the girl needed to direct the instructors to gain access to any preferred item via a mand or request.

Measurement

Data were collected for both physically prompted and unprompted mands using tally counters. A prompted mand was tallied if a request required physical prompting from an instructor. Immediately following prompting, a second teaching trial (a transfer trial) was given to provide an opportunity for an independent request, in order to fade out the dependence on physical prompting. An unprompted mand was tallied if a request was made without

any physical prompting from the instructor. No differentiation was made at the time between a mand following a verbal prompt such as "What do you want?" or purely spontaneous mands.

Data was also collected to determine the number of sessions it took the child to acquire each sign and begin using it independently. At the beginning of each session an initial or "cold" probe was conducted for each of the target mands. A "Yes" was scored if, on the first presentation, the child signed to request the target item unprompted by the instructor. A "No" was scored if she failed to request the item and needed physical prompting to do so. The criterion for a sign to be considered mastered was three "Yes" responses across three days and at least two Instructor Therapists. Further, spontaneous vocalizations and echoic (repeating) responses were tracked independent of the acquisition mastery criterion. Although a heavy emphasis was placed on mand training, other skills were also targeted throughout the session. These skills included receptive language, gross motor imitation, vocal play, and functional toy play.

Results

Initially, when teaching began, all mands required full physical prompts to assist the child to sign. However, over a relatively brief period of time following the initiation of sign language training, the child began to use targeted signs to mand or request for items. The child made her first unprompted mand using a sign she was taught during the 21st session (see Figure 1). From that point forward she began to make more requests using signs independently each session. Consequently, fewer physically prompted mand opportunities were necessary in order to keep her motivated to continue communicating.

In addition, the rate of independent acquisition of new signs increased with each successive sign (see Figure 2). That is, it took 34 sessions to master the first sign, 23 to master the second, 12 for the third, and 9 for the fourth. On several occasions the child was also observed to vocalize as she used the signs she was taught, leading us to anticipate that she may begin pairing appropriate spoken words with her signs.

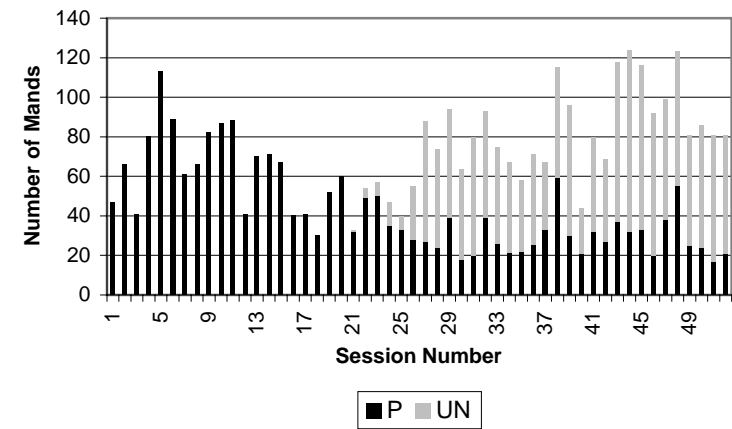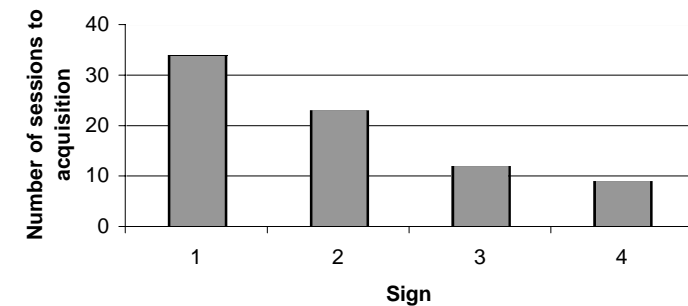*Figure 1: Prompted (P) and Unprompted Mands (UN)*

Figure 2: Rate of Sign Acquisition

Discussion

The results of this study show that it is possible to teach a very young child with autism to communicate in the form of signing, when the emphasis is initially placed on teaching requesting for highly preferred items. The data clearly show that for this child, the rate of language acquisition increased

over time, as she learned each new sign faster than the previous sign, and the number of independent mands increased substantially over time. Along with sign acquisition, this child is beginning to show verbal echoic (repeating) responses along with her signs, which is promising.

This research was designed to examine further the effectiveness of placing an emphasis on the mand during language training, taking into account our knowledge of topography (or form) based language training. From the observations and data collected, it appears that a language training program that is engineered to contrive many opportunities to mand, and that takes into account the establishing operations in the environment, may enhance a child's motivation to participate in teaching sessions, promote communication, and can be taught effectively using signs.

Glossary

Mand: A request for preferred items, attention, or information. For example, a child says "water" when thirsty and someone responds by providing water.

Targeted Mands: Requests that are specifically being taught in intensive behavioural intervention (IBI).

Tact: A label for an item or object. For example, a child says "ball" when the teacher asks "what is this?"

Naturalistic Approach: Teaching in the child's natural environment and allowing the child's motivation to guide the instructor.

Fading: Gradually reducing teaching prompts.

Reinforcement: Providing a consequence for a behaviour that increases or maintains that behaviour.

High density of reinforcement: Access to reinforcement on a continuous schedule.

Acknowledgements

References

Freeman, N. L. (1993). Behaviour is communication. *Journal on Developmental Disabilities, 2*(2), 20-29.

Freeman, N. L., Perry, A., & Bebko, J. M. (2002). Behaviour is communication: Nonverbal communicative behaviour in students with autism and instructors' responsivity. *Journal on Developmental Disabilities, 9*(2), 145-155.

Hall, G., & Sundberg, L. M. (1987). Teaching mands by manipulating conditioned establishing operations. *The Analysis of Verbal Behavior, 5*, 41-53.

Michael, J. L. (1982). Distinguishing between the discriminative and motivational functions of stimuli. *Journal of the Experimental Analysis of Behavior, 37*, 149-155.

Michael, J. L. (1985). Two kinds of verbal behavior plus a possible third. *The Analysis of Verbal Behavior, 3*, 1-4.

Michael, J. L. (1988). The establishing operation and the mand. *The Analysis of Verbal Behavior, 6*, 3-9.

Skinner, B. F. (1957). *Verbal behavior.* Engelwood Cliffs, NJ: Prentice Hall.

Sundberg, L. M. (1993). The application of establishing operations. *The Behavior Analyst, 16*, 211-214.

Sundberg, C. T., & Sundberg, M. L. (1990). Comparing topography-based verbal behavior with stimulus selection-based verbal behavior. *The Analysis of Verbal Behavior, 8*, 31-41.

Wraikat, R., Sundberg, C. T., & Michael, J. (1991). Topography-based and selection-based verbal behavior: a further comparison. *The Analysis of Verbal Behavior, 9*, 1-17.

Correspondence

Shiri Bartman
Surrey Place Centre
2 Surrey Place
Toronto, Ontario
M5S 2C2
sbartman@tpas.ca