SPEECH DEVELOPMENT IN A NON-VERBAL ADOLESCENT WITH AUTISM

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INTRODUCTION

Clinicians and parents seeking prognostic indicators are often told that if a child with autism has not developed useful speech by age five, it is "extremely unlikely" that he or she will do so. However, there have been a number of reported cases of children with autism acquiring speech after the age of five (Pickett et al., in press). Our student (AI), an adolescent with autism who was placed in an intensive home-based treatment program at age 12, was non-verbal until age 16. Rigorous multi-media documentation has allowed us to examine AI's communicative behaviors before and after speech acquisition. We formulated four research questions that guided our video analysis: 1) Did AI show any communicative intent before speech acquisition? If so, what did he communicate and how? 2) Although he was non-verbal, did he produce any phonemic sounds that could be utilized to develop speech? 3) Were there any changes in communication mode, intent, and/or phonemic repertoire after the development of speech? 4) Once speech was established, did AI's speech and language skills change during a period of less intensive intervention?

PHASE 1

PROCEDURES

Videotapes of AI were analyzed at two intervals in time, before (age 11) and after (age 17) he acquired speech, by two speech-language pathologists (EP and MMB). The SLPs viewed approximately 8 hours of video at each interval, including a variety of contexts such as structured educational activities, leisure time, and meals. Two main behaviors were coded: all vocalizations containing English phonemes and gestures with inferred communicative intent. Two characteristics were coded for each behavior: 1) The level of spontaneity at which the behavior was produced and 2) the communicative intent inferred by the coders. All vocalizations were transcribed using the International Phonetic Alphabet and broad transcription. Inter-rater reliability was measured for approximately 15% of the data. Coder agreement was 72% for occurrence of events, 94% for behaviors, 93% for spontaneity level, and 90% for communicative intent.

RESULTS

At Interval 1, AI expressed a number of communicative intents using non-words, informal gestures, and a manual communication board. However, 78% of the coded behaviors were non-words with no inferred intent. AI produced the consonants /m,b,p,j,h,w,ʍ,l,t,d,n,ŋ,f,v,g,k,s,z,ʃ,tʃ,ʒ,ʤ,θ/ and the vowels /ʌ,i,ɪ,o,u,ʊ,ɔ,æ,ɑ,e,ɛ/, and he exhibited nearly every combination of vowels as diphthongs. His five most frequently used phonemes were /m,i,h,d,ʌ/, which together accounted for 54% of all phonemes produced.

From Interval 1 to Interval 2, AI's behaviors inferred as communicative increased from 22% to 56%, and his production of non-words with no inferred intent decreased (Fig. 1). Coincidentally, behaviors coded as "upset" declined (Fig. 2). Word approximations and signs were added in Interval 2 (Fig. 3). Initiated behaviors decreased while imitated and responsive behaviors increased, reflecting the increased amount of direct speech and language instruction in Interval 2 (Fig. 4). The consonants /r,ð/ were added to his phonemic repertoire. Four of his five most frequent phonemes, /m,i,h,ʌ/, were the same in Interval 2 as in Interval 1. However, the top five phonemes in Interval 2 accounted for 44% of all phonemes produced, indicating that AI's phoneme production was more diverse in Interval 2.
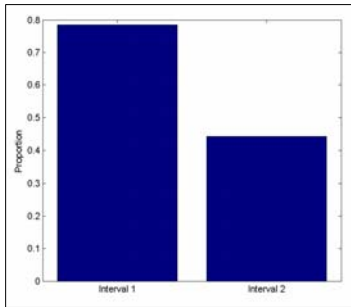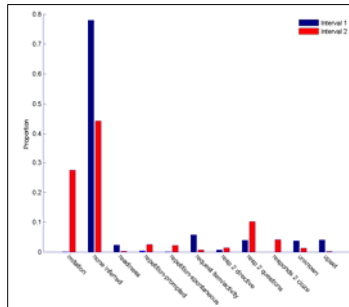

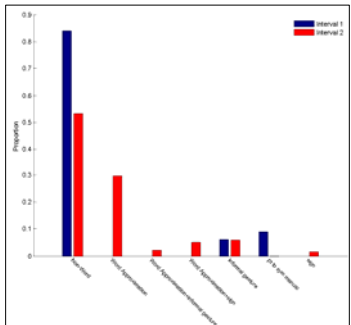Figure 1. Non-words with no inferred intent
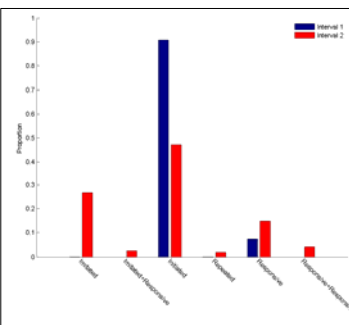

Figure 2. Communicative intent

Figure 3. Behaviors

Figure 4. Levels of spontaneity

PHASE 2

PROCEDURES

To examine skill retention, a set of videos from before, during, and after a period of less intensive intervention (summer break), when AI was 18 years old, were coded by three speech-language pathology graduate students. Approximately 3 hours of video were viewed at each of three intervals: Spring, Summer, and Fall. Unlike Phase 1, only behaviors resulting in meaningful utterances were coded. Each utterance was characterized by mode used (e.g., word approximation or sign), the situation in which it was produced (e.g., work or break), and the level of spontaneity. The actual utterances were also recorded (e.g., "I want book"). Inter-rater reliability was 93% for occurrence of events and 89% for behaviors.

RESULTS

The amount AI communicated decreased with less intensive intervention: he produced more utterances in the Spring and Fall than in the Summer (Fig. 5).

Some measures of AI's speech and language skills decreased with less intervention but did not rise again with more intensive treatment in the Fall: the proportion of utterances AI initiated spontaneously (Fig. 6), and the average number of words per utterance (Fig. 7).

Interestingly, AI seemed to be more intelligible in the Summer: the percentage of his utterances that were unintelligible decreased from 4% in the Spring to 1.5% in the Summer and then rose again to 4% in the Fall. "Yes" was the utterance AI produced the most frequently in each interval. Other common utterances were "I want," "walk," and "one."
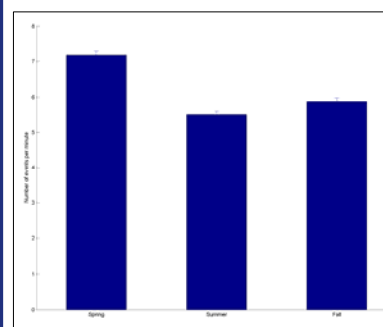

Figure 5. Number of events produced per minute in each interval
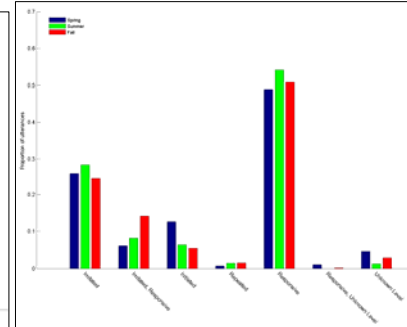

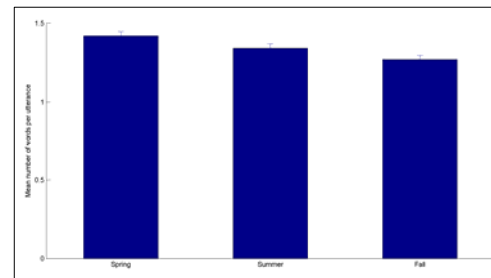Figure 6. Levels of spontaneity

Figure 7. Average number of words per utterance produced in each interval

DISCUSSION

Although non-verbal by almost any standard measures, prior to learning speech, AI communicated a variety of intents using multiple modes, and he exhibited English phonemes in his vocalizations. Furthermore, these communicative behaviors progressed from Interval 1 to Interval 2, coincident with an intensive, comprehensive treatment program. AI engaged in more communicative acts, and his communicative behaviors became more sophisticated with the acquisition of speech and signs. AI's speech development coincided with a decrease in the amount of behaviors coded as "upset." This inverse relationship between speech acquisition and maladaptive behaviors has been found in many other cases of non-verbal children with autism who were taught to use speech (e.g., Windsor et al., 1994; Bernard-Opitz et al., 2001). A decrease in the intensity of treatment tended to have different effects on different aspects of AI's speech and language skills. His rate of communication, production of spontaneous utterances, and utterance complexity decreased during a period of less intensive intervention, but his intelligibility increased. We conclude that communicative intent and oral communicative potential may be present in such individuals as AI, even at a relatively advanced age. Moreover, with intervention some such individuals may be able to achieve usable levels of oral speech production.

Works cited

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Windsor, J., Doyle, S. & Siegel, G. (1994). Language acquisition after mutism: A longitudinal case study of autism. Journal of Speech and Hearing Research, 37, 96-105.