Communicative intent and vocalizations in older nonverbal children with autism

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Absract: Although a large proportion of individuals with autism never develop speech, do they display any of the precursors for speech and early communication? A retrospective videotape analysis was performed at two intervals in time to investigate communication and vocalizations in two older, nonverbal adolescents with autism. Both participants' communicative behaviors progressed from Interval 1 to Interval 2. They increased their percentage of behaviors perceived as communicative, and both added new communicative intents. Both participants expanded their modes of communication between intervals: one began using a voice output visual communication aid, while the other learned speech and sign language.

SUMMARY OF PROPOSAL

Introduction: A large proportion of individuals with autism never develop functional speech. Much of the current emphasis in the autism field is on early intervention, and few studies investigate communication in older, non-verbal children with autism. Although they are not using speech, do these individuals display any of the articulatory precursors to speech that could potentially be used to build speech? Do they display any of the precursors for development of social interaction and early communication? We formulated three research questions that guided our work with two older, nonverbal participants with autism: 1) Do they show any communicative intent? If so, what are they communicating and how are they communicating it? 2) Do they produce any sounds that might be perceived as phonemic? 3) Are there any changes in communication mode, inferred communicative intent, and/or phonemic repertoire over time?

Methods: This study was a retrospective videotape analysis. Videotapes of our two participants, SR and AI, were analyzed at two intervals in time. At Interval 1, SR was 8 years old and AI was 11; at Interval 2, SR was 13 and AI was 17. Eight hours of video were coded for each subject at each interval by two speech-language pathologists using the Noldus Observer XT software. Fifteen percent of the video was coded by both coders and checked for inter-rater reliability.

The SLPs viewed a variety of contexts, and two main behaviors exhibited by the participants were coded: all vocalizations containing English phonemes, and gestures with inferred communicative intent. For each behavior, the following was coded: type of gesture (informal gesture, sign, manual symbols, or voice output visual communication aid (VOCA)) or vocalization (non-word or word approximation); level of initiation of the behavior (e.g., initiated, imitated, responsive); and inferred communicative intent (e.g., comment, protest/refusal, respond to question). For vocalizations, syllable configuration was also coded (e.g., isolated vowel, CV, C-string, humming). All vocalizations were transcribed using the International Phonetic Alphabet and broad transcription.

Results: At Interval 1, both SR and AI demonstrated communicative intent through a variety of modes. Both used non-words, informal gestures, and a manual communication board to express a number of intents, such as "request item/activity," "upset," and "response to questions." However, for both participants, the majority of behaviors were non-words with no inferred intent (SR: 70%, AI: 78%). Both participants had a surprisingly large phonemic repertoire during Interval 1. SR and AI had at least one occurrence of the consonants /m,b,p,j,h,w,ʍ,l,t,n,ŋ,f,v,g,k,s,z,ʃ,ʧ,ʒ,ʤ,ɵ/ and the vowels /ʌ,i,ɪ,u,ʊ,æ,ɑ,e,ɛ/. They exhibited nearly every combination of vowels as diphthongs. AI also produced /ɖ,ð/. The majority of the phonemes SR produced were vowels, while AI demonstrated a more equal distribution of vowels and consonants. SR's syllable configurations mainly consisted of isolated vowels, V-strings , and humming, while AI mainly used humming, C-strings, and V-strings. SR and AI shared 3 of their 5 most frequently used phonemes: AI - /m,i̲,h̲,d,ʌ̲/, SR - /ʌ̲,i̲,h̲,ɑ,ɛ/.

To answer the research question of whether or not there were any changes over time, Interval 1 was compared with Interval 2. SR's behaviors inferred as communicative by the coders increased from 30% of his total behaviors in Interval 1 to 36% in Interval 2, and AI's rose from 22% to 59%. SR's use of non-words decreased from 93% of his total behaviors to 72%, while his use of informal gestures VOCA increased. AI's production of non-words decreased from 84% to 49%. His development of speech and sign language which occurred between the two intervals was evident by the increase in his word approximations and signs. Both participants' communicative intent also changed. SR's intent of "upset" decreased and "response to questions" increased. AI's behaviors with no inferred intent decreased by half, while "response to questions" and "imitation" rose. SR added three new intentions that did not exist in Interval 1, and AI added five. SR's total number of vocalizations decreased between intervals. His proportion of vowels and consonants did not change, but his syllable configurations were different in Interval 2. Instead of the main configurations of isolated V, C-string, and humming that were found in Interval 1, SR's vocalizations mainly consisted of isolated C, isolated V, V-string, and humming. AI produced the same amount of vocalizations in each interval, but his total number of phonemes decreased, indicating that his vocalizations contained fewer phonemes in Interval 2 than in Interval 1. His use of vowels increased from 46% of his total phonemes in Interval 1 to 61% in Interval 2. AI's syllable configurations expanded from three main configurations in Interval 1 to five in Interval 2. AI's humming decreased from half of his vocalizations to one quarter. Neither SR nor AI's phonemic repertoire changed much from Interval 1 to Interval 2. Three of SR's five most frequent phonemes were the same between intervals /ʌ ,i,ɑ /, and three of AI's top five also remained the same /i,h,ʌ / even though he acquired speech.

Conclusions: Both SR and AI's communicative behaviors progressed from Interval 1 to Interval 2. Both participants increased the percentage of behaviors perceived as communicative by the coders, and both added new communicative intents. Also, both participants expanded their modes of communication: SR began using a VOCA between intervals, while AI learned to use speech and sign. Based on these results, it is concluded that older, low-functioning children with autism do communicate, and their vocal and early linguistic skills continue to develop even in the absence of speech production. In addition, as demonstrated by AI, speech acquisition is possible at a late age. Because they do change over time, vocalizations and communicative attempts should be thoroughly observed and documented periodically to inform treatment decisions. Although it is important to provide a child with alternative means for communication when he is not producing speech at an appropriate level, modes of communication should be revisited as the child gets older.

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