Title: Developing an Observational Measure of the Flexible Use of Pre-linguistic Vocalizations in Preverbal Children with Autism

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Background: Up to thirty percent of children with Autism Spectrum Disorder (ASD) persist in using minimal spoken language despite early intervention. It is unknown why some children with ASD develop spoken language and some do not. Previous studies have suggested that children with ASD demonstrate differences in pre-linguistic skills, such as vocalizations, that are useful in predicting the extent to which they will develop spoken language abilities. A foundational pre-linguistic skill that has not been investigated in children with ASD who are not yet using spoken language (i.e., preverbal children with ASD) is the ability to combine vocalizations with different types of affect. The goals of this study were: (1) to determine if preverbal children with ASD demonstrate the full range of vocalizations and affective states evident in language-matched TD peers, and (2) to develop a measure of pre-linguistic vocalization functional flexibility (PVFF) in preverbal children with ASD to ascertain whether children with ASD are able to use vocalizations with affect flexibly.

Method: An existing longitudinal data set from The Useful Speech Project (Yoder, Watson & Lambert, 2015; Woynaroski et al., 2016) was used for this study. The children with ASD who were enrolled in this study were between the ages of 20-48 months at baseline and were examined at five total measurement points separated by 4 month intervals. For the present study, we draw upon Time 2 multimedia recordings of each child as they participated in two different semi-structured assessments with built-in communication presses: Communication and Symbolic Behavior Scales and Early Symbolic Communication Scale. A partial-interval coding scheme was used to code these multimedia recordings for the occurrence of vocalization and affect types. Vocalizations and affect were coded during two separate passes in order to avoid having the codes for one behavior influence the other. Vocalizations produced by children were classified in five categories based on pitch and phonation quality: squeal, vocant, growl, cry and laughter. Facial affect was categorized as positive, negative or neutral.

Results: The behavioral coding method developed for this study was found to be reliable for both vocalizations (Protophones: mean 0.88 and range: 0.80-0.98) and affect (mean: 0.92 and range 0.67-1) and stable (R= 0.97 for protophones, R=0.85 for negative affect, R= 0.85 for neutral affect, and R= 0.93 for positive affect). A significant minority of ASD participants demonstrated limited variety in their expressed vocalizations and affect. Six participants (30%) did not demonstrate the full range of protophones, and five participants (25%) did not demonstrate the full range of affect. Pre-linguistic vocalization functional flexibility was operationalized using an operant contingency values (OCV) approach to quantify the degree of association between vocalization types and affect types. The analysis revealed predominately negative OCV values for neutral affect and protophones in this sample (i.e. vocalizations were more likely to be produced in the absence of neutral affect). OCV values for negative affect and protophones revealed predominately positive values (i.e. vocalizations were more likely to be produced with negative affect than other affective states).

Discussion: The results of the analysis indicate that preverbal children with ASD demonstrate limited flexibility in their use of vocalizations with different affect. In a social communication context, this could limit the types of messages that children with ASD are sending to communication partners including parents. If these results are replicated, PVFF could be integrated as an early target in an intervention, due to its early developmental emergence.

References:


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