

A crosslinguistic study on prosodic characteristics in non or minimally verbal autism

Laura Smorenburg¹, Jill Thorson², Aoju Chen¹ and Wolfram Hinzen³

¹Utrecht University, ²University of New Hampshire, ³Universitat Pompeu Fabra

Of those diagnosed with autism, approximately one-third is non or minimally verbal (NMVA). Severe impairments are reported in this population for syntax, morphology, and vocabulary in both production (Chenausky et al., 2019) and comprehension (Slušná et al., 2021). One unexplored domain is prosody. Crucially, prosody can be independent of words. Although those with NMVA lack phrase speech and a functional vocabulary, they still vocalize. In the current study, we use existing datasets to ask how prosody is used in the vocalisations of children and adolescents with NMVA from different language environments (American English: Thorson et al., 2016 and Catalan/Spanish: Slušná et al., 2021). American English has a wider pitch range than Catalan and Spanish (Astruc-Aguilera et al., 2009), as well as different syllable structures and rhythmic properties. It was hypothesized that effects of ambient language would be found, implying acquisition of prosodic abilities.

Datasets (English: $N = 5$, mean age = 12;3, $SD = 4;9$, Catalan/Spanish: $N = 23$, mean age = 11;4, $SD = 4;0$) consisted of the Autism Diagnostic Observation Schedule sessions. All nonvegetative vocalizations were segmented and labelled as 'verbal' or 'nonverbal'. F0 median and span and utterance duration were extracted from each vocalization using Praat (Boersma & Weenink, 2024). Linear mixed modelling was used to look at the effect of ambient language, vocalization type (verbal, nonverbal) and autism severity on prosodic features.

Preliminary results show that verbal vocalizations have lower median F0 than nonverbal vocalizations and that this difference is larger for Catalan/Spanish. Vocalization duration was longer as autism severity increased in English but not Catalan/Spanish, which may be related to the consonant-to-vowel ratio differences between the languages. More analysis is needed to confirm language-specificity in prosody in NMVA. Future work will focus on the communicative function of prosody in NMVA.

References

- Astruc-Aguilera, L., Payne, E., Post, B., Prieto, P., & Vanrell, M. M. (2009). Acquisition of tonal targets in Catalan, Spanish and English. *Cambridge Occasional Papers in Linguistics*, 5, 1-14.
- Boersma, Paul & Weenink, David (2024). Praat: doing phonetics by computer [Computer program]. Version 6.4.21, retrieved 24 September 2024 from <http://www.praat.org/>
- Chenausky, K., Brignell, A., Morgan, A., & Tager-Flusberg, H. (2019). Motor speech impairment predicts expressive language in minimally verbal but not low verbal, individuals with autism spectrum disorder. *Autism & Developmental Language Impairments*, 4, 1-12.
- DiStefano, C., & Kasari, C. (2016). The window to language is still open: Distinguishing between preverbal and minimally verbal children with ASD. *Perspectives of the ASHA Special Interest Groups SIG 1*, Vol.1(Part 1).
- Slušná, D., Rodríguez, A., Salvadó, B., Vicente, A., & Hinzen, W. (2021). Relations between language, non-verbal cognition, and conceptualization in non-or minimally verbal individuals with ASD across the lifespan. *Autism & Developmental Language Impairments*, 6.
<https://doi.org/10.1177/23969415211053264>
- Thorson, J. C., Usher, N., Patel, R., & Tager-Flusberg, H. (2016). Acoustic analysis of prosody in spontaneous productions of minimally verbal children and adolescents with autism. In the supplement to the proceedings of the 40th Annual Boston University Conference on Language Development (BUCLD), Boston, MA.