Accented vs native exposure in child second language intelligibility

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It is generally accepted that *more* exposure to language leads to improvements in child language abilities [1]. However, it is still not clear to what degree quality of the input affects language development. In the case of acquisition of the phonological system of a second language, children often have exposure to both native and accented speakers of the second language. Especially in Korea, there has been a push for more native exposure in children to aid phonological acquisition [2]; however, the improvement of English-speaking abilities as a result of such exposure is difficult to quantify. There have been studies showing children as young as 5-years-old can attune their speech to be more similar to an exposed stimulus in the short term [3]. Therefore, any effects found in the long term may also be evident after short term exposure. This study focuses on both quantity and quality (native vs accented) of English input in the development of English phonological systems in children. Further, we examine if the effects of input are detectable in both the short- and long-term.

Sixty-eight children aged 6-9 years old were recruited to participate in this study. Children were native Korean speakers residing in Korea, with varying degrees of English language abilities. Children participated in an experimental task in addition to multiple language tests in English and Korean. Parents filled out information about the child's language development and detailed information about the child's weekly exposure to both accented and native English. The experimental task was a series of exposure and test trials under two conditions. In the first condition, the exposure stimuli were recorded by a native English speaker and in the second condition, the stimuli were recorded in English by a Korean accented speaker. For exposure trials, participants performed a picture identification task which included 2 images on a screen and an auditorily presented English word. The English words alternated between having an initial phoneme from a set of 2 that are not easily distinguishable in Korean ([b] vs [v]; [p] vs [f]; [l] vs [r]). Following exposure to 4 English words, participants performed 2 test trials which included a picture naming task where they named words from a set of minimal pairs with an initial phoneme from the same difficult to distinguish set (e.g. bee vs vee). Children spoke the words into a microphone on a headset they were wearing, and each participant provided 72 single word recordings to be judged. Condition and order of phoneme sets were counterbalanced.

Recordings were judged, blind to condition, for intelligibility by a native English speaker (first author). The data for four words that we expected our participants to have trouble producing (fan, vee, lock, rock) were used for all analyses. Five participants were excluded due to various reasons. Three analyses were performed to answer our research question. The first analysis looked at the effect of short-term native vs accented English exposure during the course of the experimental task. Intelligibility was assessed with a logistic mixed effect model regressing intelligibility on condition and including a random intercept and slope for condition using the afex package [4] in R. Average intelligibility of the words in the accented condition was 0.74 (SD = .44) and in the native condition was 0.76 (SD = .43) and the model indicated that the addition of condition did not significantly improve the model (χ^2 (1) = .01, p = .94). The second analysis examined how long-term experience with accent affected performance on the task. Here intelligibility of all difficult items regardless of condition were regressed on the overall percentage of weekly English exposure provided according to parent report. The proportion of English exposure was square root transformed to account for the skew of the data.

The logistic regression indicated that addition of English exposure significantly improved the model (χ^2 (1) = 13.79, p < .001). Finally, percentage of weekly English exposure was divided into exposure from a native vs accented English speaker. These two variables were entered into logistic regression. Both variables were again square root transformed to account for skew. The addition of native English exposure improved the model significantly when controlling for accented exposure (χ^2 (1) = 10.15, p < .01) and the addition of accented English exposure significantly improved the model when controlling for native exposure (χ^2 (1) = 8.53, p < .01). See Figure 1 for a depiction of the last model. Model coefficients can be used as quasi effect size measures in logistic regressions; the accented exposure (b = .51, SE = .17) had a higher coefficient than native exposure (b = .43, SE = .13).

Our results clearly show that in both short and long-term, differences in native vs accented exposure do not lead to large differences in intelligibility. If anything, accented exposure seemed to be a stronger predictor of intelligibility than native exposure. This is likely the result of differences in how the exposure is received (i.e. in person vs recordings) rather than the type of exposure. Overall amount of exposure played a large role in intelligibility, such that whether or not the exposure is accented or native, more exposure led to higher intelligibility. However, intelligibility is only one way of rating foreign accent. Data coding is ongoing with ratings of accent of each recording being the next item to be analyzed. Ratings of accent are expected to vary much more than ratings of intelligibility since an item can be highly foreign accented and yet still very intelligible. Results with regard to accent will also be discussed.

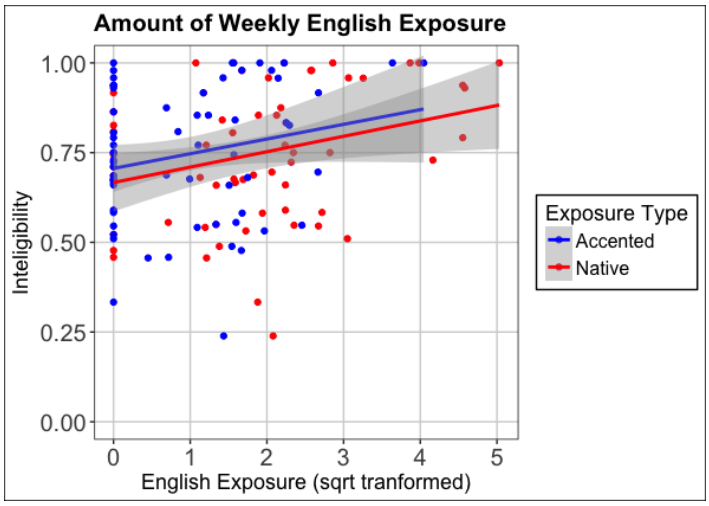

Figure 1 Amount of average weekly exposure to accented vs native English speech. Each point represents one child, grey represent standard errors. Exposure is square root transformed such that a 5 represents approximately 25% exposure on an average week.

References

[1] Hart, B., & Risley, T. R. (2003). The early catastrophe: The 30 million word gap by age 3. *American educator*, *27*(1), 4-9.

[2] Jeon, M., & Lee, J. (2006). Hiring native-speaking English teachers in East Asian countries. English Today, 22(4), 53-58.

[3] Nielsen, K. (2014). Phonetic imitation by young children and its developmental changes. Journal of Speech, Language, and Hearing Research, 57(6), 2065-2075.

[4] Singmann, H., Bolker, B., Westfall, J. and Aust, F. (2017). afex: Analysis of Factorial Experiments. R package version 0.18-0. https://CRAN.R-project.org/package=afex