Perception of ATR in Dàgáárè

Within the ATR harmony literature, there are several claims that rest on the perceptibility or lack thereof of certain ATR contrasts. For example, Rose (2018) suggests that the lack of perceptibility of ATR contrasts in high vowels is why languages with an ATR contrast in high vowels almost always have ATR harmony. However, very little research has been done on how native speakers of ATR languages perceive ATR contrasts. As such, confirming Rose's (2018) hypothesis requires investigating two largely untested sub-hypotheses: that ATR contrasts are hard to perceive in high vowels, and that ATR harmony helps with ATR perception.

Results of the limited existing literature on perception of ATR contrasts in high vowels are mixed. Fulop et al. (1998) found that Degema listeners perceived ATR contrasts better in mid vowels than in high vowels, while Rose et al. (2019) found that Akan listeners achieved over 90% accuracy in differentiating ATR in all CV syllable types, including for high vowels. In this study, we report on two experiments to investigate the perception of ATR in Dàgáárè (Gur; Ghana), examining both perception of different ATR contrasts and the effect of (dis)harmony on ATR perception.

In Experiment 1, we conducted an ABX task, in which 24 native Dàgáárè listeners judged the contrasts [i]~[ɪ], [ɪ]~[e], and [e]~[ɛ] in contexts of monosyllables (e.g. [ki] vs. [kɪ]), before harmonic high vowels (e.g. [kiki] vs. [kɪkɪ]), before harmonic mid vowels (e.g. [kike] vs. [kɪkɛ]), and before harmonic cross-height vowels (e.g. [kike] vs. [kɪke]). Overall accuracy rates were relatively low (~68.5% across conditions), but participants were significantly worse at cross-height ([ɪ]~[e]) differentiation as both contrast and context (p<0.05). No other effects were significant.

In Experiment 2, we conducted another ABX task, but with only the particularly difficult [ɪ]~[e] contrast. In addition to monosyllabic and harmonic (identical) disyllabic contexts, this experiment tested 24 native Dàgáárè speakers on four disharmonic contexts: before and after [ɪ] (disharmonic for [e] tokens) and before and after [e] (disharmonic for [ɪ] tokens). We found that speakers performed approximately equivalently on monosyllabic and harmonic contexts, but performed worse on disharmonic contexts, significantly so in three of the four contexts (p<0.05; cf. Figure 1).

Based on these results, we conclude that ATR harmony does not help perception in Dàgáárè, but disharmony does impede it, providing a form of perceptual motivation for the existence of ATR harmony. In line with previous research, we also find that ATR contrasts are not particularly difficult to perceive in high vowels ([i]~[ɪ]), but that the [ɪ]~[e] contrast is particularly difficult to differentiate. We discuss the implications of these results for the typology of ATR harmony.
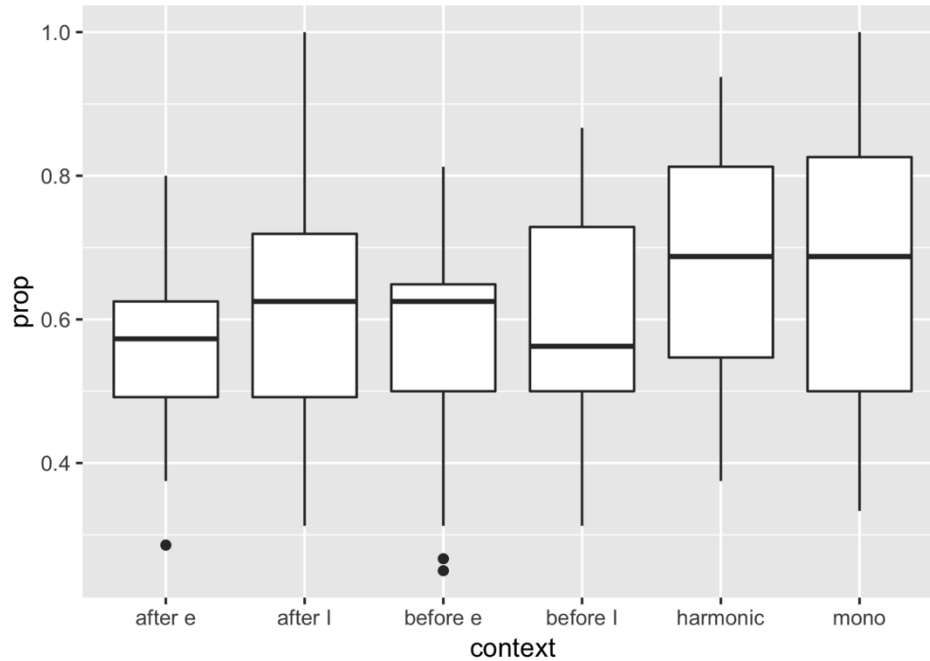
Figure 1: Proportion correct by context for Experiment 2

References

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