

Language Discrimination and Whistled Speech

Mary Ann Walter

Cambridge University/Middle East Technical University, Northern Cyprus Campus

walter@metu.edu.tr

Introduction

Whistled speech has drawn increasing attention in recent years both in the scholarly literature (Kouneli et al. 2013, Meyer 2015) and popular media (Nijhuis 2015, Robson 2017). As Meyer observes, in all documented cases, whistled language is based on the ambient spoken language. The whistled version relies primarily on pitch contours for tonal languages, and approximation of spectral transitions for non-tonal ones, sometimes with a reduced segmental inventory. This basis in speech distinguishes it from other non-speech modes of language, in particular sign languages, with their fully independent grammar systems.

Such whistled languages are reported to be unintelligible to residents of neighboring areas sharing the same native spoken language. As such, they represent a novel source of information as to the nature of speech perception.

This study investigates language discrimination among untrained, non-whistling speakers of whistled languages. While within-language vowel discrimination in whistled speech has been studied previously (Meyer et al. 2017), discrimination between languages has not. I find that such speakers are able to identify their own native language when whistled (versus whistled versions of other languages) at above-chance rates.

Methods

Participants included 48 native speakers of Turkish (28 female, 20 male) between the ages of 18 and 30 with hearing normal or corrected to normal and no direct experience of whistled language.

Whistled stimuli were assembled from television broadcast quality recordings of whistled Turkish, Spanish, Greek, French, and Chinantec (Oto-Manguan, Mexico), drawn from documentaries on whistled speech. These naturalistic samples were divided into clips of between 4 and 8 seconds in duration at prosodically-appropriate phrase boundary locations.

Each participant listened to 12 pairs of clips, randomized according to order and selected clip, divided evenly among the 4 language pairs.

Participants performed a forced-choice decision task in which they indicated on a printed response sheet which clip in each pair was their native language, Turkish.

Results and Conclusions

Participants were slightly but significantly above chance at identifying their native language versus other languages in whistled form (see Table 1 for data summary).

This difference was driven largely by enhanced discrimination between Turkish and French, and to a lesser extent, Turkish and the neighboring, though unrelated, language Greek.

Participants could not reliably discriminate between Turkish and Spanish or, despite its typological dissimilarity, between Turkish and Chinantec.

Just as neonates are able to discriminate between the “native”/ambient speech variety and other classes of languages based on the restricted phonetic information available to them while still in the womb (see review in Ramus 2002), naïve listeners are also able to discriminate between their native language and others based on the relatively restricted acoustic information and novel modality of whistled speech, even in the absence of intelligibility.

	N correct	% Correct	Significance*
Turkish overall	6.65 /12	55	p=.017
Turkish/French	1.82 /3	61	p=.003
Turkish/Greek	1.71 /3	57	p=.055
Turkish/Spanish	1.58 /3	53	p=.280
Turkish/Chinantec	1.53 /3	51	p=.413

Table 1. Language discrimination of whistled speech, overall and by language

*As found by 1-sample t-tests

References

- Kouneli, Maria, Julien Meyer & Andrew Nevins. 2013. Whistled languages: Including Greek in the continuum of endangerment situations and revitalization strategies. In Mari C. Jones & Sarah Ogilvie (eds.), *Keeping languages alive; Documentation, pedagogy and revitalization*: 198-211. Cambridge: Cambridge University Press.
- Meyer, Julien. 2015. *Whistled languages – A worldwide inquiry on human whistled speech*. Springer, Berlin.
- Meyer, Julien, L. Dentel, and F. Meunier. 2018. Categorization of natural whistled vowels by naïve listeners of different language background. *Front. Psychol.* 8:25.
- Nijhuis, Michelle. 2015, August 10 & 17. The whistled language of northern Turkey. *The New Yorker*. <https://www.newyorker.com/tech/elements/the-whistled-language-of-northern-turkey> Accessed 14-09-2017.
- Ramus, Franck. 2002. Language discrimination by newborns. *Annual review of language acquisition* 2: 85-115.
- Robson, David. 2017, May 25. The beautiful languages of the people who talk like birds. BBC
 BBC 2017. <http://www.bbc.com/future/story/20170525-the-people-who-speak-in-whistles>
 Accessed 14-09-2017.