Whistled Speech and Language Discrimination

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Spanish

‘una botella de vino tinto’

a bottle of red wine
Καλώς ήλθατε. Είσαι καλά?

Kalos ilthane. Ise kala?

Welcome. Are you well?
What are whistled languages?

♦ A widely-attested language modality
  ♦ Remote, mountainous and heavily vegetated areas

♦ Based on [non-standard varieties of] ambient spoken language

♦ Implications for language origins
  ♦ Bonnie the orangutan ➔ spontaneous imitative whistling,
    Smithsonian National Zoo, 1980s
What are whistled languages?

♦ Chinantec example (Sicoli 2016)
What are whistled languages?

- Silbo Gomero (Spanish) example (Rialland 2005)
What are whistled languages?

♦ “Pitch variation is found to encode segmental distinctions in the first type of language [non-tone languages, which transpose F2 patterns] and tonal distinctions in the second [tonal languages, which transpose tone melodies]. What is common to both is the central role of amplitude modulations, which provide a frame with respect to which segmental boundaries are defined and major segmental classes are distinguished.” (Rialland 2005)

♦ Consonant transitions manifest as conventionalized adaptations of CV F2 transitions and H1 amplitude modulations
Current status

♦ In most cases, endangered or moribund

♦ Chinantec –
  ♦ Used by men only
  ♦ Formerly the focus of an adulthood initiation
  ♦ Less skillful users could be fined
  ♦ These practices now discontinued
  ♦ Could change with more outside interest

♦ Whistles in the Mist, featuring linguist Mark Sicoli
Current status

♦ 20th “Bird Language” Culture and Art Festival

♦ Includes contest as well as demonstration

♦ ~10,000 in attendance

♦ Facebook group: Kuşdilini Tanıtıma Kültür Ve Turizm Derneği (Cultural and Touristic Association for Bird Language Promotion)
Current status

♦ In French Pyrenees, last whistler died ~2000
♦ Documented in 1960s by Busnel (Meyer 2015)
♦ Still alive in popular memory (cathedral plaque), revitalization effort in 2008
♦ http://www.lemondesiffle.free.fr (compilation)
♦ Short documentary:
  https://www.youtube.com/watch?v=AymnVY_xXPg
Current status

♦ Silbo Gomero, Canary Islands, Spain

♦ Already pre-Spanish conquest, possibly related to use in Atlas Mountains by Berber speakers

♦ Masterpiece of the Oral and Intangible Heritage of Humanity, UNESCO, 2009

♦ Compulsory in local schools since 2005
Current status

♦ Antia, Greece (moribund)

♦ Topic of two documentaries
  ♦ 1980 – https://www.youtube.com/watch?v=LHp2yDNc304
  ♦ And more recently by Nevins and Kouneli -
    https://www.youtube.com/watch?v=EHc7x_zDwl4

♦ And one conference, 2014

♦ Community site: http://sfyria.com/ (in Greek)

♦ Academic sites:
  https://www.ucl.ac.uk/llsd/projects/Whistled_language
  https://elar.soas.ac.uk/Collection/MPI483785
Previous research

♦ Historical and contemporary documentation, phonetics (Busnel, Meyer, Sicoli, Rialland)

♦ Neural correlates
  ♦ Left-hemisphere activation, as for speech, for whistlers only (Carreiras 2005)
  ♦ Bilateral activation, compared to left-lateralized speech (Gunturkun et al 2015)

♦ Perception
  ♦ Comprehension over distances (maximum 10 kilometers), without faces, map task
  ♦ Whistled vowel discrimination (Meyer et al 2017)
    ♦ Spanish whistler >> Spanish non-whistlers >> French >> Chinese
Language discrimination

♦ Today’s questions:

♦ Can non-whistlers discriminate between the whistled version of their language and whistled versions of other languages?

♦ To what extent is this facilitated by individual factors such as training, L2 exposure, etc?
Materials

♦ Sound clips of whistled speech were assembled

♦ broadcast-quality television sources
♦ all currently available on youtube
♦ between 4-8 seconds duration, somewhat longer than those used in e.g. infant discrimination studies
♦ divided at prosodically-appropriate phrase boundaries
♦ no background speech or music
♦ Turkish, Bearnese, Spanish, Greek, Chinantec
Participants and Task

♦ Participants
  ♦ 48 native speakers of Turkish (28 female)
  ♦ Between the ages of 18-30, hearing normal
  ♦ No direct experience of whistled speech

♦ Task
  ♦ Forced-choice decision
  ♦ 12 randomly-selected pairs of whistling clips
    ♦ Re-sorted if all 3 instances of a language were ordered together
    ♦ Or if Turkish-non-Turkish order repeated more than 4x

♦ For each pair, which one is Turkish?
**Language discrimination**

- Overall, participants were able to correctly distinguish Turkish whistling in 6.65/12 cases (55%).

- Slightly but significantly above chance (p=.017)

**Overall correct responses (n/12)**

- 9 “low” scores (0-4 correct)
- 19 “medium” scores (5-7 correct)
- 19 “high” scores (8-12 correct)
Language discrimination

♦ Some language pairs are more discriminable than others.

♦ Typological dissimilarity does **not** lead to better discrimination (Chinantec)

♦ Why Bearnese?
  ♦ Global reach of French
  ♦ Most common additional language for this population

♦ Why Greek?
  ♦ Close neighbor
  ♦ Balkan sprachbund
Language discrimination

- Participants were divided into those with at least one year of classroom French instruction (n=34) and those with none (n=14)

- French learners are not significantly better at discrimination

- The familiarity benefit comes from outside, not inside, the classroom
Language discrimination

♦ Participants were divided between Turkish Cypriots, with substantial passive naturalistic exposure to (Cypriot) Greek (n=12), and mainland Turks, without such exposure (n=36)

♦ Turkish Cypriots are **not** significantly better at discrimination

♦ The familiarity benefit extends across the region

![Correct responses, N/3](chart.png)
Language discrimination

- Participants were divided between those who viewed a collection of short films about whistled languages (n=31) and those who did not (n=17)

- The films totaled 1 hour in length and included a subsequent group discussion about such languages

- Film watchers are **not** significantly better at discrimination

- Minimal training has no effect
Discussion

♦ Non-whistlers are able to discriminate between their whistled language and others

♦ Amount and type of exposure to other languages has no effect on discriminability

♦ More relevant is the global familiarity or ‘reach’ of a language for a certain population
Discussion

♦ Compatible with data from the Great Language Game (Skirgard et al 2017)
  ♦ [https://greatlanguagegame.com/](https://greatlanguagegame.com/)
  ♦ Confusability datasets available

♦ The most identifiable language (of 78) is French

♦ Most predictive factor for identification is global reach
  ♦ indexed by frequency of the language name’s occurrence in English and Chinese Google Books

♦ Followed by GDP of main country
Discussion

- Neonates show a similar ability to discriminate between “native”/ambient language and others despite the limited acoustic information available to them through the filter of the womb (Ramus 2002)
  - Based primarily on duration and intensity, C/V ratio

- Despite total lack of intelligibility, listeners can discriminate even under conditions of extreme limitations in the acoustic signal

- Whistled modality represents a novel source of information on important issues including language perception and origins and the relation of acoustic signals to phonological categories
Bibliography

Broadcast sources

- https://www.youtube.com/watch?v=P0aoguO_tvI
- https://www.youtube.com/watch?v=cDFlqTCfBrI
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