

## The hyperspace effect in Standard Modern Greek and two Greek dialects

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Listeners' perceptual targets are exaggerated compared to their productions, a phenomenon known as the "hyperspace effect" (e.g. Frieda et al. 2000; Johnson 2000; Johnson et al. 1993). Whalen et al. (2004) questioned the validity of such a perception-production comparison since perception responses are mapped to a single (synthetic) voice while production data are averaged across participants.

This study further investigated the hyperspace effect by comparing the perception and production of vowels by speakers of Standard Modern Greek and two regional dialects (Cretan and Kozani Greek). In experiment 1, participants produced the five Greek vowels (/i, e, a, o, and u/) in isolation and in a carrier sentence and performed a perception task where they chose vowel best exemplars (prototypes) from synthesised vowels modeled to the voice of a speaker of their dialect (i.e., to the voice of one Standard Modern Greek, one Cretan, and one Kozani speaker respectively). A goodness optimisation method allowed participants search for vowel prototypes from a large stimulus set containing more than 100,000 vowels (see Iverson and Evans, 2009 for a detailed analysis of the procedure). In experiment 2, the three speakers who had made the recordings for the best exemplars experiment, participated themselves in the experiment. As a result, the synthetic vowels were modeled to their own voice, which allows a direct comparison of their perceived and produced vowel spaces.

Across dialects, participants' perceived spaces were more expanded than the produced ones for isolated vowels, which were in turn more expanded than those for vowels in sentences. These results were confirmed in experiment 2; all three speakers who had mapped vowel prototypes to their own voice, had perceived spaces more expanded than their produced ones. This suggests that the hyperspace effect is not an artifact of the methodology used in previous studies but instead a robust phenomenon that reveals listeners' internal representations of vowels.

### References

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