

The Perceptual Learning of Time-Compressed Speech: A Comparison of Training Protocols with Different Levels of Difficulty

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INTRODUCTION

Speech perception can be improved substantially with practice (perceptual learning) (Samuel & Kraljic, 2009).

Several approaches exist for skill acquisition including:

- **Constant vs. variable training**
- **Errorless** (Karni & Sagi, 1991) **vs. desired level of difficulties** (Bjork & Bjork, 2011).

It is still not clear which training yields the most perceptual learning of time-compressed speech.

GOAL

Determining which protocols' features are important for the perceptual learning of time-compressed speech and its generalization

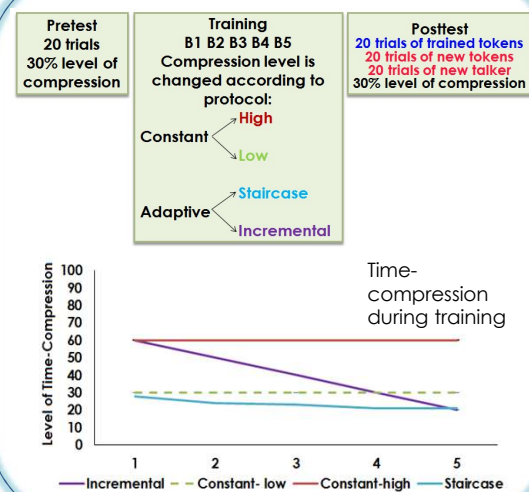
METHODS

Participants. 65 native Hebrew speakers.

Stimuli. 120 simple active sentences in Hebrew (Prior & Bentin, 2006).

Time-Compression. using a WSOLA algorithm (Verhelst & Roelands, 1993).

General Procedure



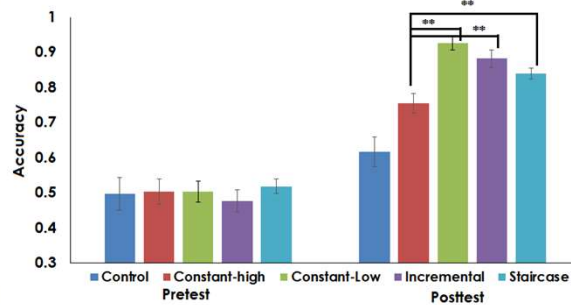
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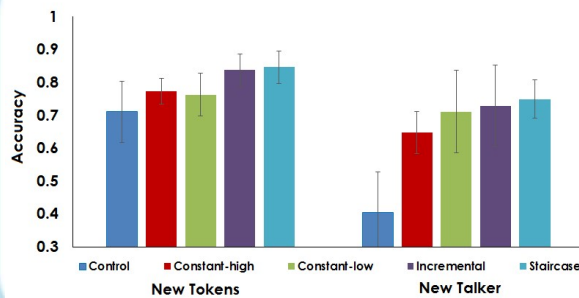
RESULTS

Performance gains



For **trained tokens**, lowest performance on the constant-high protocol, $t(24) = -5.38, p < .01$.

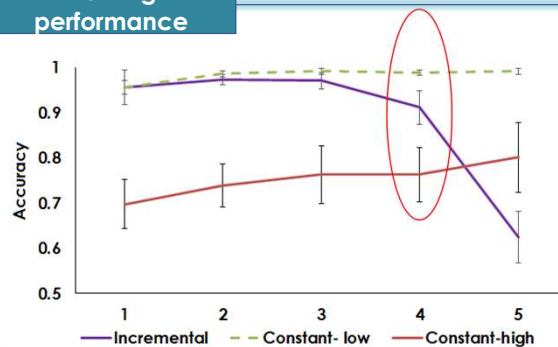
Generalization



For **new tokens** – adaptive protocols are better than constant, $F(1, 60) = 5.83, p = .01$.

For **untrained talker**, a trend toward significance, $F(1, 48) = 3.57, p = .06$, implies the lowest performance in the constant high protocol.

Training performance



Performance accuracy at the 4th block is the lowest in the constant-high protocol, $F(1, 24) = 17.32, p = .00$.

CONCLUSIONS

Initial training on "easy items" (errorless learning) can facilitate the perceptual **learning** of speech - lowest performance when initial trials are difficult.

Speech-rate variability can support **generalization** - better performance in adaptive compared with constant protocols.

The differences between acoustic input and lexical representations are smaller in adaptive compared to constant protocols, thus enabling a more gradual adaptation.

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