

Cognitive style in speech accommodation

Investigating Autistic-spectrum Quotient as a factor in phonetic imitation

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Introduction

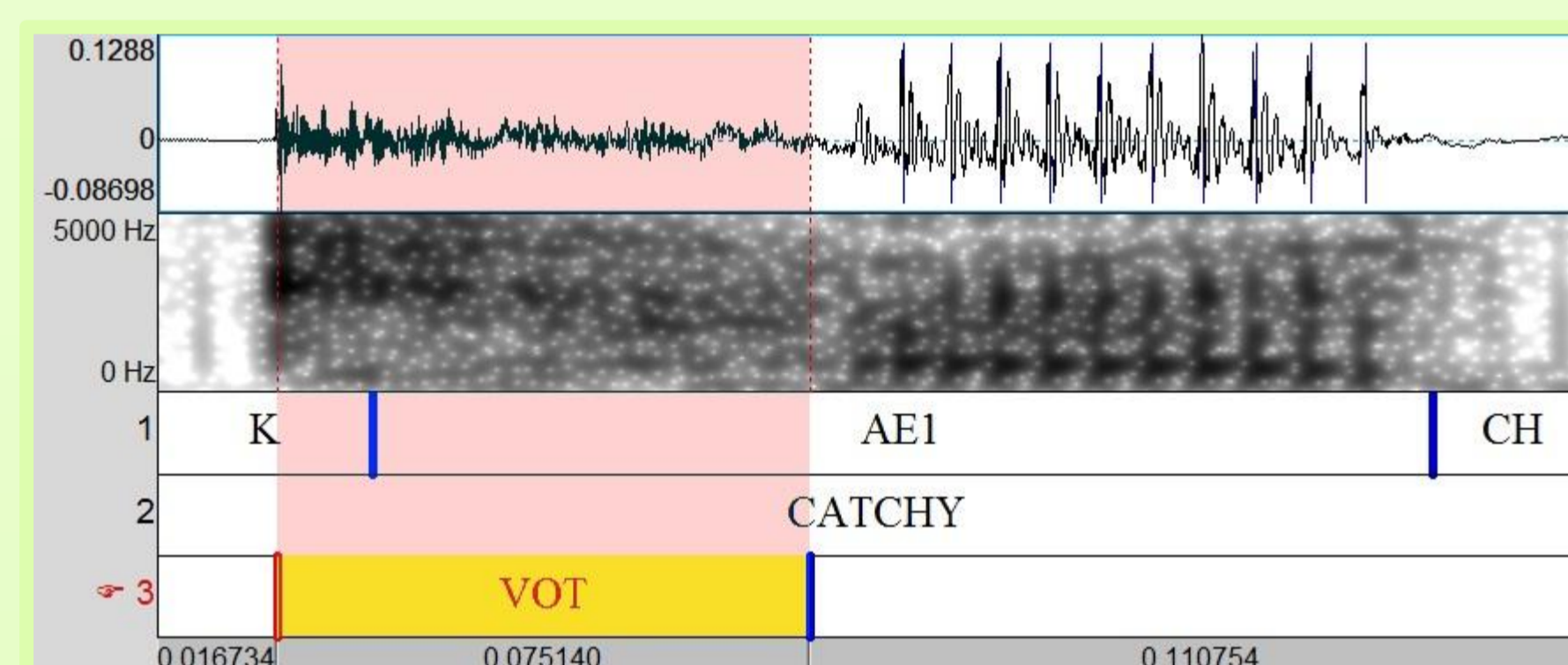
The purpose of this project was to test the hypothesis that variation in cognitive style affects how words are stored in the mental lexicon.

Research Question

Do individuals with high Autism Quotient (AQ) scores show different imitation behaviour than individuals with low AQ scores?

Hypothesis

High-AQ participants will tend to imitate an exaggerated property more in the words in which they heard it, and low-AQ participants will tend to generalize the exaggerated property—voice onset time—to other words.



VOT: the length of time that passes between when a stop consonant is released and when voicing, the vibration of the vocal folds, begins.

Why?

This study follows up a clinical observation about the linguistic behaviour of high-functioning Autistic children with an experiment that has implications for models of linguistic representations and processing.

Children with Asperger's syndrome sometimes have word-specific pronunciations, based on the accent of the person they heard a word from.

This study investigates a previously unexplored area of research and may lay groundwork for future study with clinical populations that would have more direct implications for individuals with Autism Spectrum Disorders.

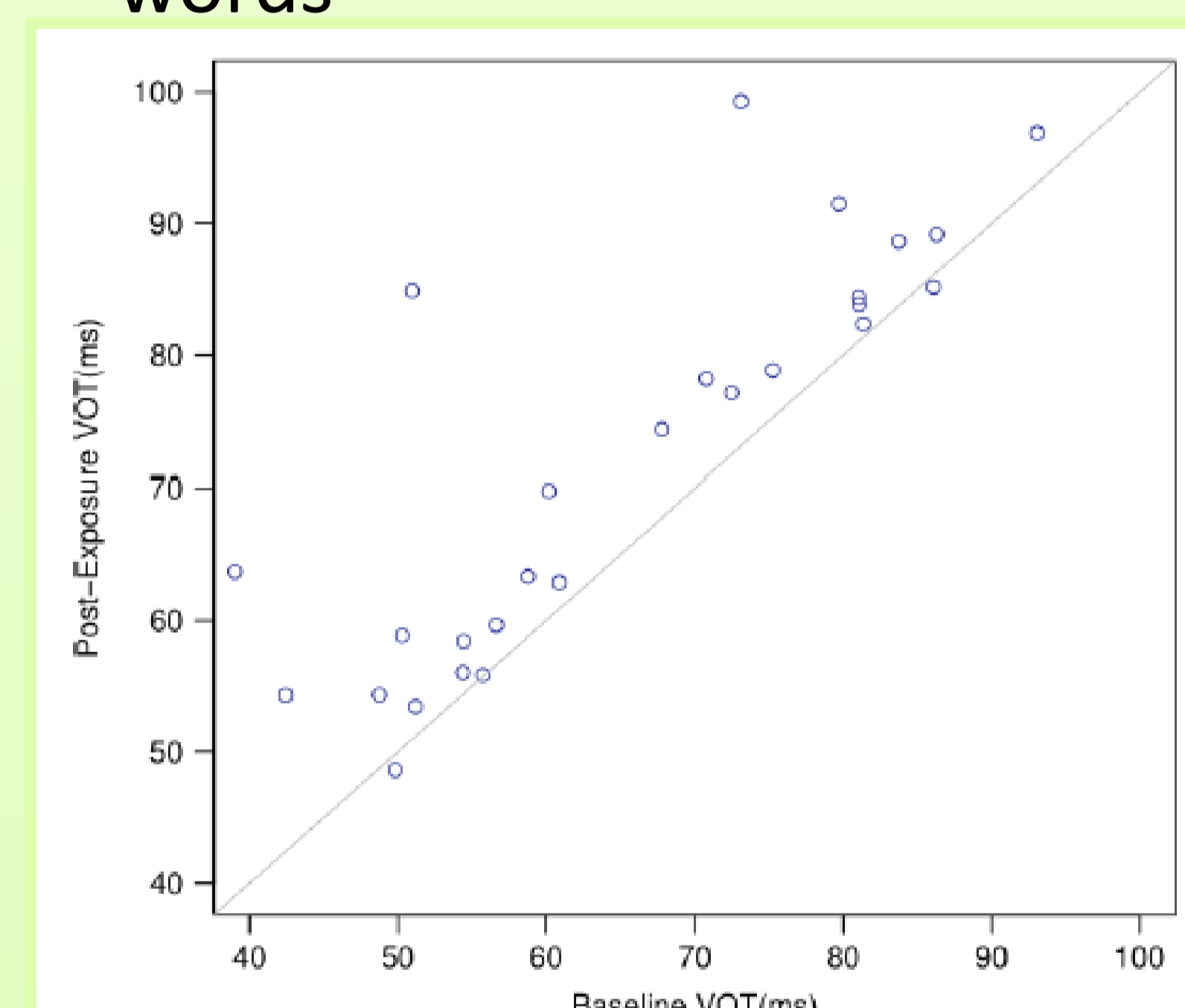
Method

Data Collection

Collection of Speech Data

The speech data collection procedures are based on the Nielsen's (2007) modified imitation paradigm.

1. Participants read a list of words
2. Participants listen to a recording in which the Voice Onset Time (VOT) of all word-initial [p]s has been increased
3. Participants reread the list of words



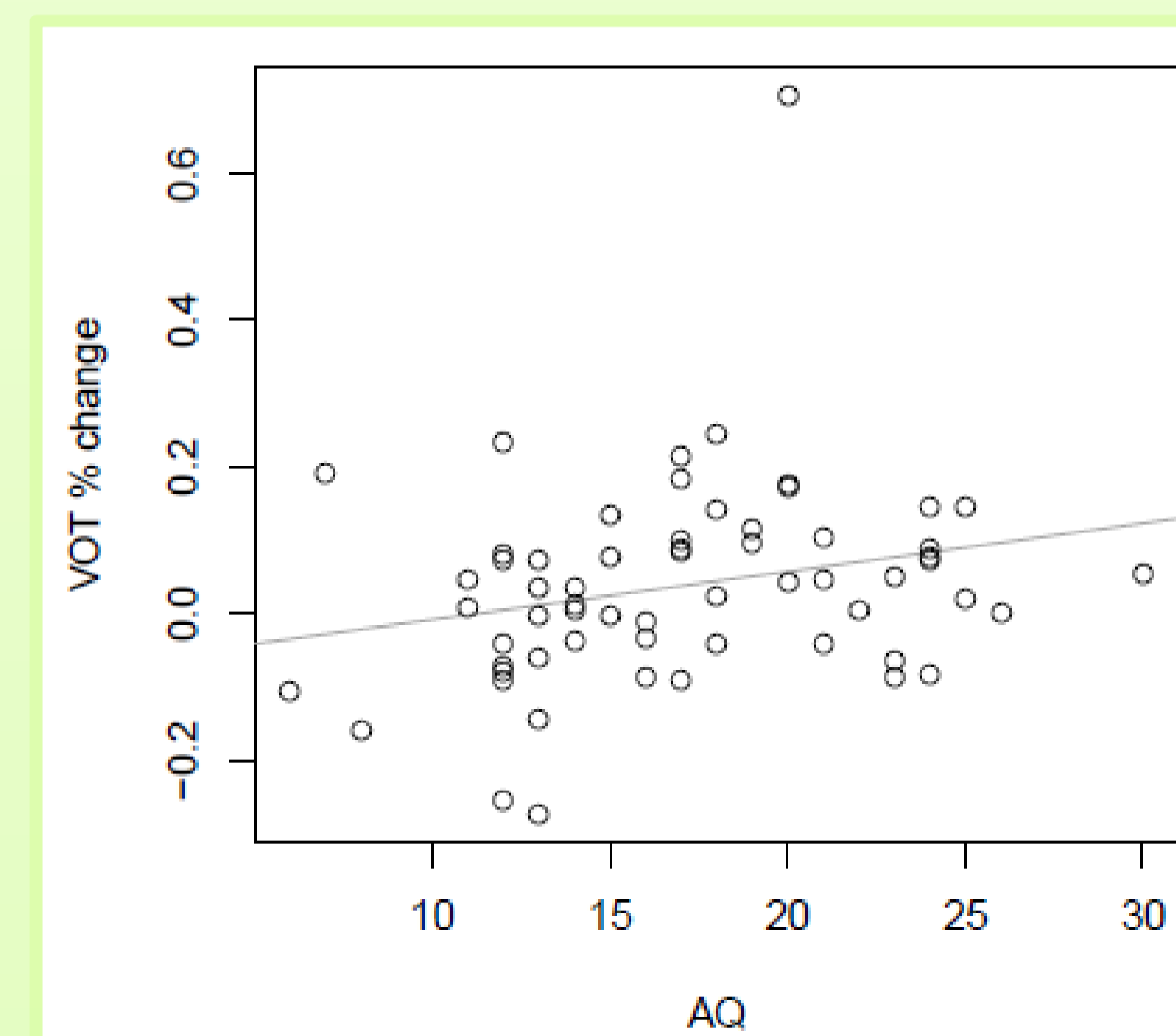
Nielsen (2011)

Participants produced significantly longer VOTs after being exposed to target speech with extended VOTs. They also generalized to new instances of /p/ and the new phoneme /k/. This included an initial familiarization block where participants read the words silently, which was omitted from our experiment.

Autism Quotient Test

The Autism Spectrum Quotient (Baron-Cohen et al. 2001)

- Self-administered test of Autistic-like traits made up of 50 questions
- Used as a diagnostic tool
- Mean AQ score for neurotypicals is 16.4
- 80% of people diagnosed with an autism spectrum disorder score above 32



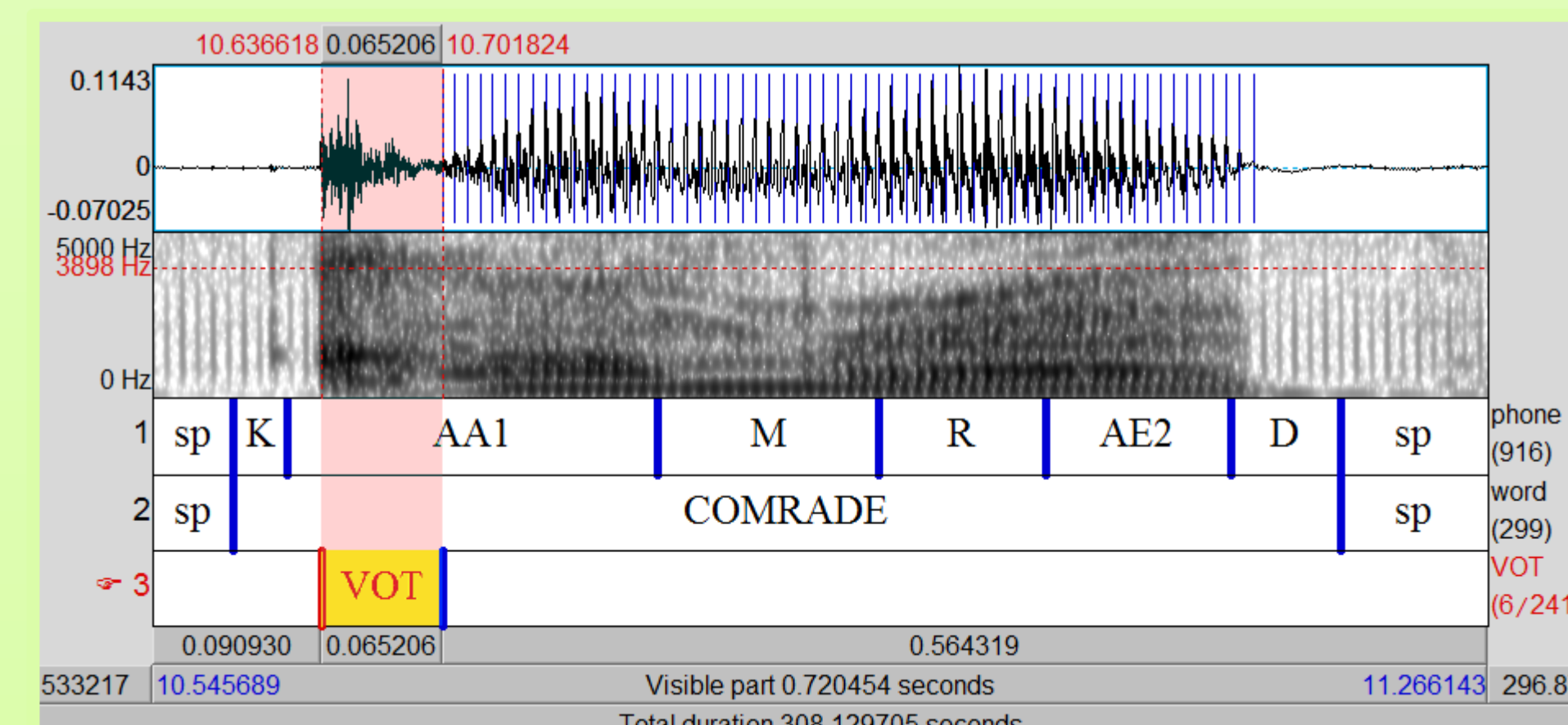
Participants in our experiment

- 61 native speakers whose data we have analyzed
- Recruited from linguistics and computer science classes

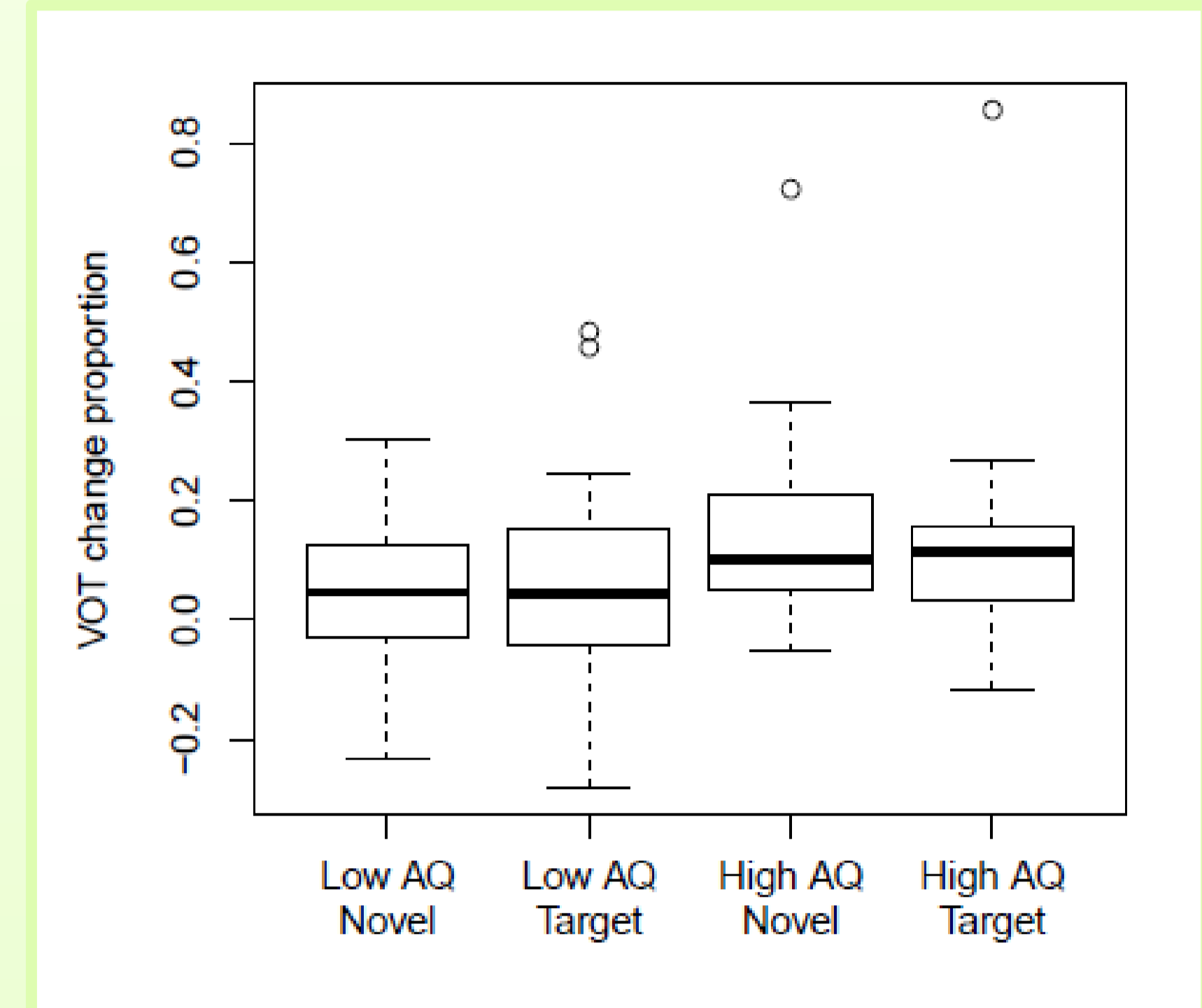
Data Analysis

An algorithm was applied to Praat, which added the VOT tier.

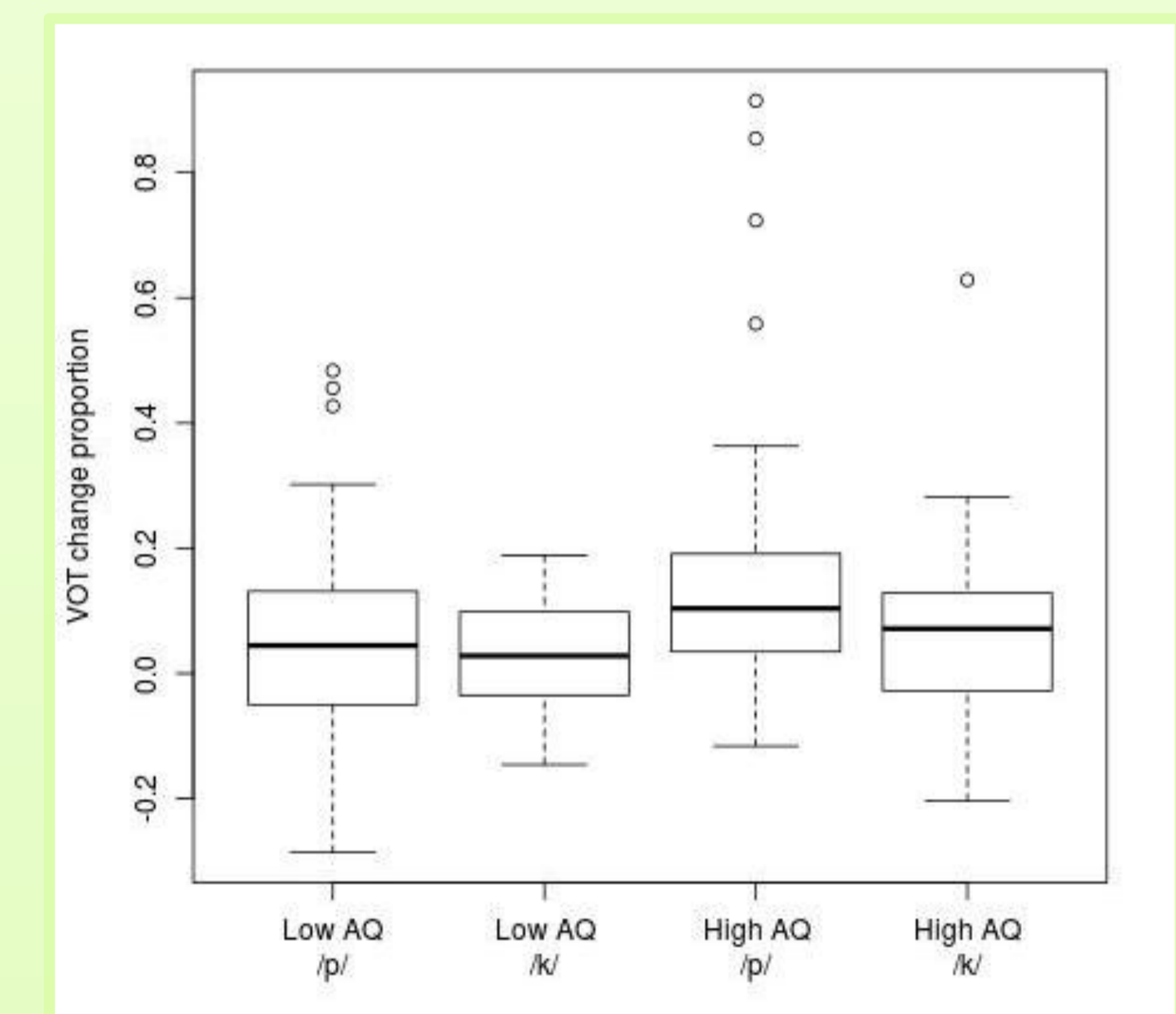
The algorithm tried to find the release and the onset of voicing by finding an abrupt start of noise (the release) and then finding the nearest glottal pulse to that point, which should be the onset of voicing.



Conclusions



VOT change by AQ and Target/Novel



VOT change by AQ and Segment

Results

- Positive correlation found between AQ score and VOT % change
- Target words were more exaggerated by higher AQ participants, as expected

What can we take away from our results?

- Surprisingly little imitation in the first place. Why?
- Hard to interpret differences because all subjects are in the neurotypical range
- Encouraged to continue experiment with Autism Spectrum Disorder subjects and use the other subjects as a control group