USING AN EYE-TRACKER IN THE STUDY OF PHONEMIC HEARING INFANTS – A COMPARISION RESEARCH METHODS

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INTRODUCTION

Number of studies shows that preverbal infants differentiate the speech sounds that occur in both their native language and foreign languages (Kuhl 2003).

With child development, differentiation of some of the sounds disappear and some will be intensified. Confirmation of this assumptionis hindered by a technical problems.

The test requires the infant to maintain long state of focus. The child, however, quickly distracted attention and going to recalibrate eye-tracker (ET).

MAIN

The conducted research have two main objectives:

- (1) replication of the results obtained in studies of US and Japanese infants (Kuhl 2003)
- (2) comparism of the effectiveness of two methods 2AFC type (two-alternative forced choice) (Albareda Castellot vs. Bjerva) allowing at the earliest possible diagnosis of differentiation of speech sounds.

METHODS

- The study invited parents with children (N = 12, including 5 girls) aged between 7 and 12 month old (M ≈ 9.2 SD≈ 1.6) with wich:
  - N = 6, including 3 girls; 8-11 mths (M ≈ 9.2 ≈ 1 SD) by ELMO
  - N = 6, including 2 girls; 7-12 mths (M ≈ 9.2 ≈ 2.1 SD) by 2A.
- Use of two methods based on anticipation the position appears of visual object depending on the presented stimulus sound (Czoska 2015).
- In order to validate predictions, a procedure using ET SMI and our in-house developed platform Gaze Controlled Application Framework (GCAF)*.
- The languages stimuli were French and Polish pseudo-words sounding as follows: feda, feud, feufa, feufou.
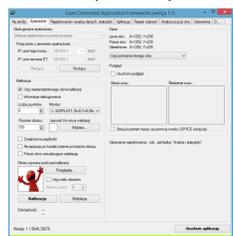
*What is GCAF?
GCAF is a platform for easy building of customized applications controlled by gaze. It is possible due to new interface description language, namely Gaze Interaction Markup Language (GIML) based on human readable XML files.
The GCAF allows collection of events history and basic statistical analysis. Data containing complete information including an analysis of eye movement and can be exported to common formats such as CSV, XML or plain text. There is no need to use additional software. It is also possible to record a sequence of screenshots or video of test.
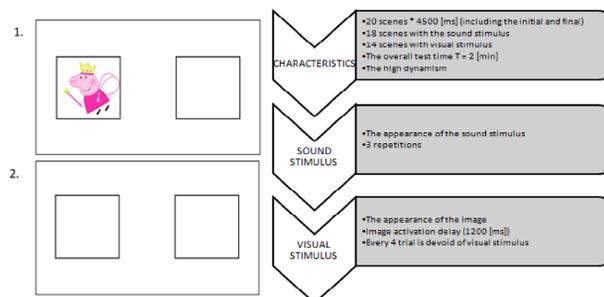
TASKS

Method 1: ELMO
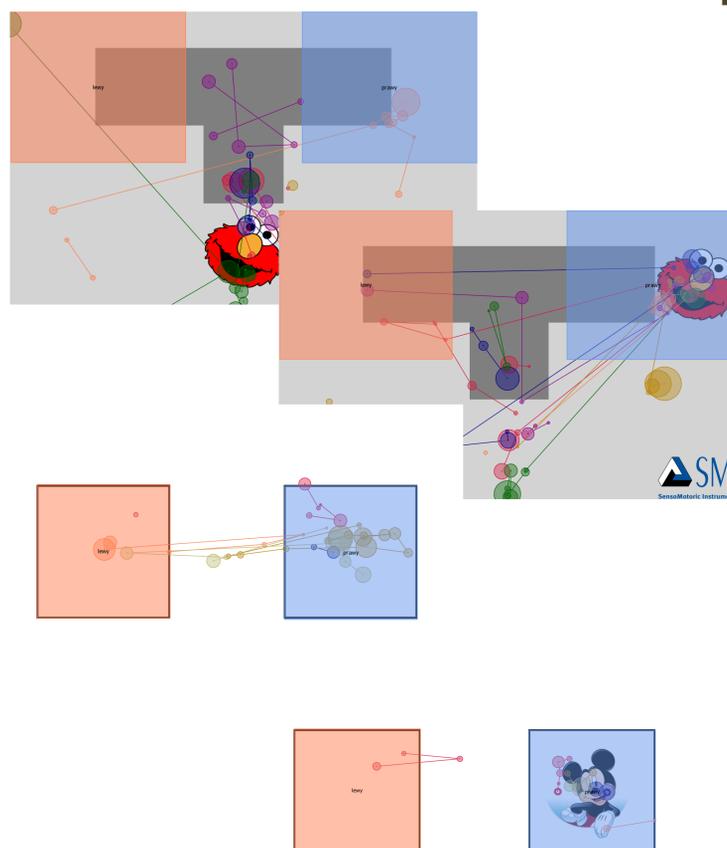(Albareda-Castellot B. 2011)
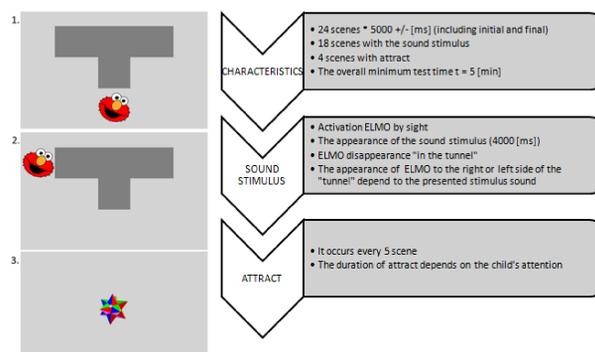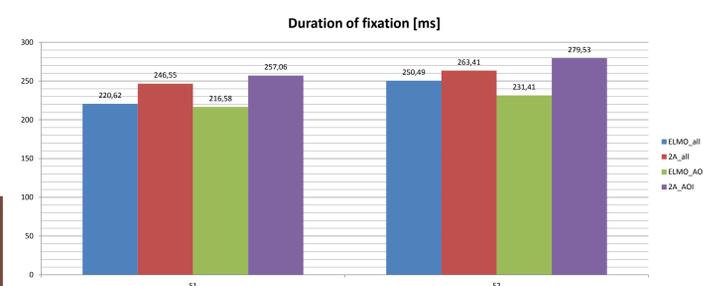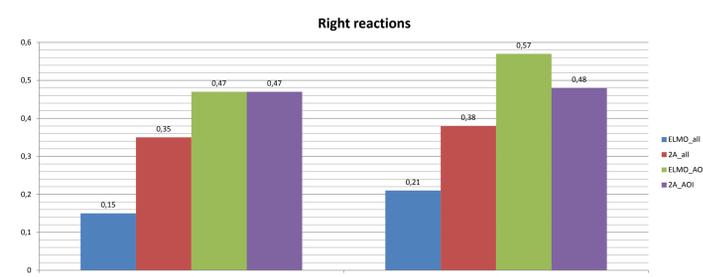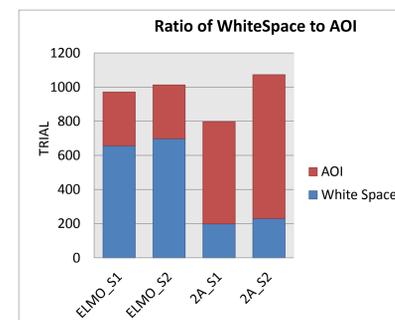

Method 2: 2A (two areas)
(Bjerva J. 2011)

SCAN PATH EXAMPLES

During and after the sound stimulus

RESULTS

Ratio of WhiteSpace to AOI

Right reactions

Duration of fixation [ms]

CONCLUSIONS

Our results confirm that the preverbal infants differentiate speech sound occurring both in their native language and foreign languages.

Method 2A is more attractive to infants due to its dynamism and diversity of visual stimuli.

100% of respondents using 2A gave results usable for analysis, where in the case of ELMO this was only 33%.

In comparison with the ELMO, method 2A is shorter and attracts more attention.

LITERATURE

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