

## Introduction

Speech perception is a multimodal process:

- using auditory and visual input
- in which seeing the speaker influences comprehension
  - in noisy environments (Sumbly & Pollack, 1954)
  - in aphasia (e.g. Shindo et al., 1991)

### The McGurk effect

- discovered by McGurk and MacDonald (1976)
- dubbing of non-matching auditory (/pa/) and visual (/ka/) information
- perception: fusion of both (/ta/)
- has been described in aphasia: patterns similar to non-brain-damaged (nbd) controls (Campbell et al., 1990; Klitsch, 2008)

### Aims

- gaining more information on processing
- finding potential differences between aphasic and nbd participants

## Participants

All participants are Dutch, right-handed, with normal hearing and (corrected to) normal vision

- 14 non-brain-damaged control subjects
  - with no neurological problems or (history) of language disorders
- 3 aphasic subjects with comprehension disorders (details in Table 1)

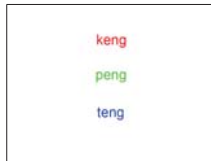
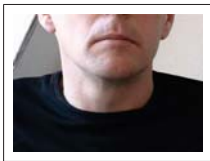
Initials	Age	Gender	Type of Aphasia	Months post onset	PALPA Nonword Discrimination
WB	57	male	Wernicke	148	56/72
EK	48	male	Anomic	16	58/72
JH	51	female	Mixed	44	66/72
controls (mean)	56	50% male 50% female	-	-	71.75/72 <sup>1</sup>

TABLE 1: Demographics and nonword discrimination scores of the aphasic participants and the group of non-brain-damaged control participants

## Method & Materials

### Task: Nonword Identification

1. Presentation of video
2. Answer choices
3. Recording of answer & reaction time (RT)



### Materials

- CVC(C) structure
- starting with /p/, /t/ or /k/
- 4 conditions:
  - auditory only (AO)
  - audiovisual (AV)
  - visual only (VO)
  - McGurk (McG)

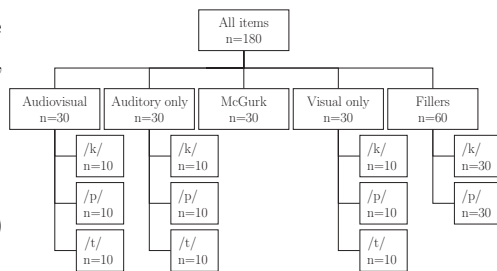


FIGURE 1: Overview of material used

### Analysis

- Aphasic vs. control subjects: Are aphasic subj. within ndb range?
- Between conditions: Wilcoxon Test
- Answer types within McG condition: Friedman Anova & Wilcoxon
- Reaction times per answer type: Kruskal-Wallis & Mann-Whitney-U

## Results

- Each aphasic subject worse than nbd controls in AO, AV & VO
- Each aphasic subject slower than nbd controls in AO & VO; EK & JH also slower than nbd controls in AV
- Aphasic subjects: better and faster in AV than AO
- Nbd control subjects: also faster in AV than AO
- Within McGurk condition:
  - No difference in answer patterns between aphasic and nbd subjects
  - RT depend on answer type for nbd but not for aphasic subjects

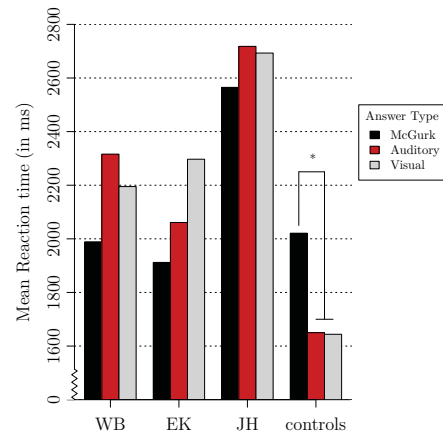


FIGURE 2: Reaction time per answer type  
\*: Mann-Whitney-U Test,  $p < .05$

## Discussion

Findings:

- Beneficial influence of speechreading on perception
- qualitative differences between aphasic and nbd subjects:

Hypothesis: Aphasic subjects have no access to unimodal information → only multimodal processing → no slow-down

### Reaction times on fusion percepts

Nbd subjects experience slow-down

- because fusion needs additional resources
- access to unimodal information before fusion (Soto-Faraco & Alsius, 2007)

## References

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