

The role of stress position in bilingual word recognition: Cognate processing in Turkish and Dutch

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INTRODUCTION

- Effect of stress position on cognate processing in Turkish and Dutch by Turkish-Dutch bilinguals in the Netherlands.
- Research in the visual modality: co-activation of overlapping orthographic, phonological and semantic representations of the two languages → cognate facilitation effect (e.g., Dijkstra & van Heuven, 2002).
- Little research in the auditory modality.

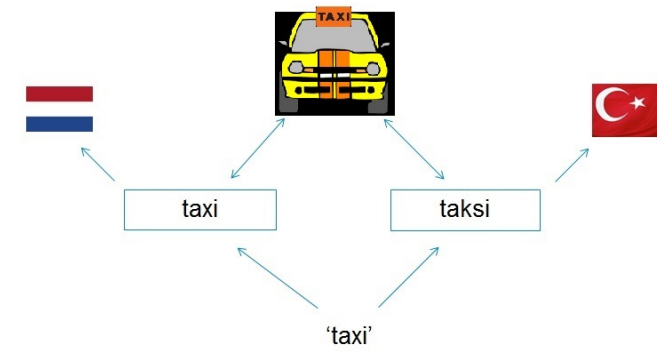


Fig. 1. Representation of the Turkish-Dutch cognate 'taxi'.

THE PRESENT STUDY

- Cognate processing in the auditory modality.
- Turkish and Dutch differ regarding stress position:
 - Turkish: stress location is predictable; mostly ultimate stress (Inkelas & Orgun, 2003; Kabak & Vogel, 2001).
 - Dutch: stress location is more variable; tendency for stress on first syllable (van Donselaar et al., 2005; van Oostendorp, 2012).
- Cognates in Turkish and Dutch: congruent or incongruent:
 - Turkish *baLON* – Dutch *baLLON* 'balloon' (ULT-ULT)
 - Turkish *TEnis* – Dutch *TEnnis* 'tennis' (PEN-PEN)
 - Turkish *moTOR* – Dutch *MOtor* 'motor' (ULT-PEN)

RESEARCH QUESTIONS

- Is there evidence for a processing difference between cognates and non-cognates in auditory word recognition in Turkish and Dutch?
- What is the effect of stress position in the two languages on the bilingual processing of cognates?

➤ Auditory lexical decision tasks with EEG in Dutch and in Turkish.

- ERP-component: N400: semantic integration (e.g., Hauk & Pulvermüller, 2004) and stress position (e.g., Domahs et al., 2013).

HYPOTHESES

- Cognates will be processed faster than non-cognates and N400 will be smaller for cognates.
- Cognates with congruent stress in Turkish and Dutch will be processed faster than cognates with incongruent stress and N400 will be smaller for cognates with congruent stress.

METHODS

Participants:

- Dutch: 20 Turkish-Dutch bilinguals (15 female; mean age: 21.9 years).
- Turkish: 21 Turkish-Dutch bilinguals (14 female; mean age: 21.1 years).
- Sociolinguistic background questionnaire (NetQ, 2002), language proficiency ratings, and Boston Naming Test (Kaplan et al., 2001) → The participants' L1 is Turkish, but their dominant language is Dutch.

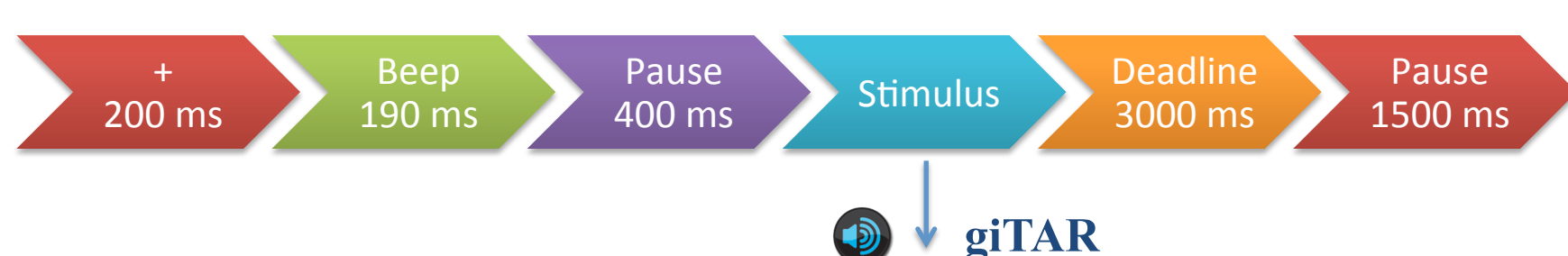
Materials:

- Two-syllable items in three stress conditions:

| Condition | Example | Stress position |
|-----------|-----------------------|-----------------|
| ULT-ULT | <i>giTAR – giTAAR</i> | congruent |
| PEN-PEN | <i>TEnis – TEnnis</i> | congruent |
| ULT-PEN | <i>tüNEL – TUnnel</i> | incongruent |

- 30 cognates, 30 non-cognates, and 60 non-words per condition.
- Word frequency, phonological similarity, semantic similarity.

Procedures:



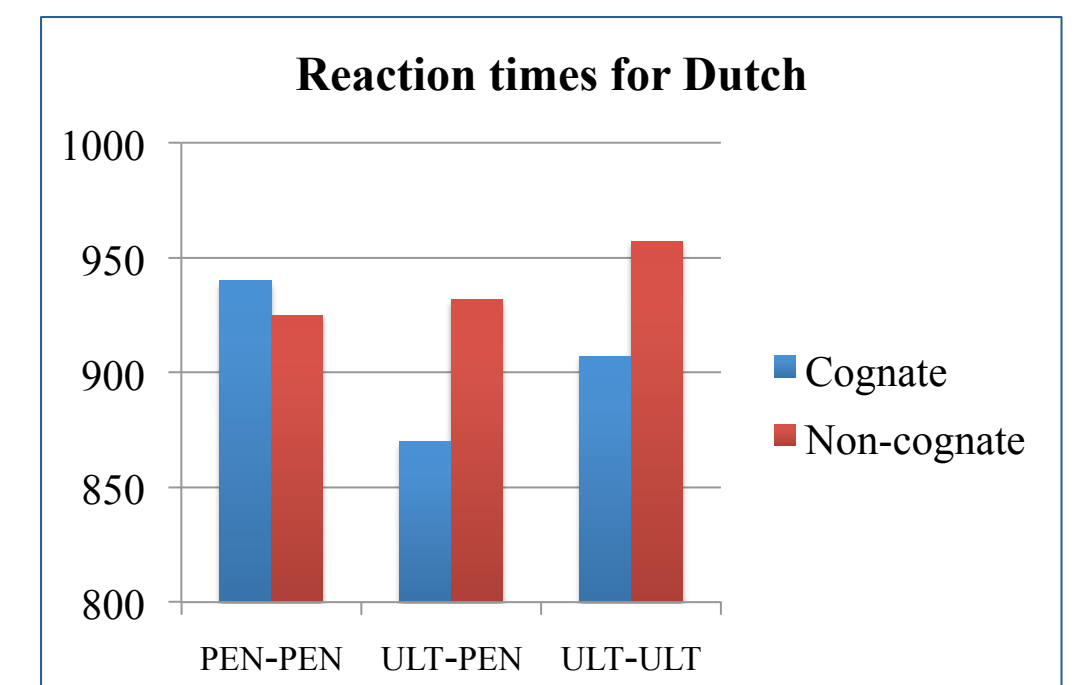
- 4 blocks, with 90 trials per block; pseudo-randomized stimuli.

RT RESULTS

- Mixed-effects regression modeling with lmerTest package (Kuznetsova et al., 2014) in R (R Core Team, 2014).

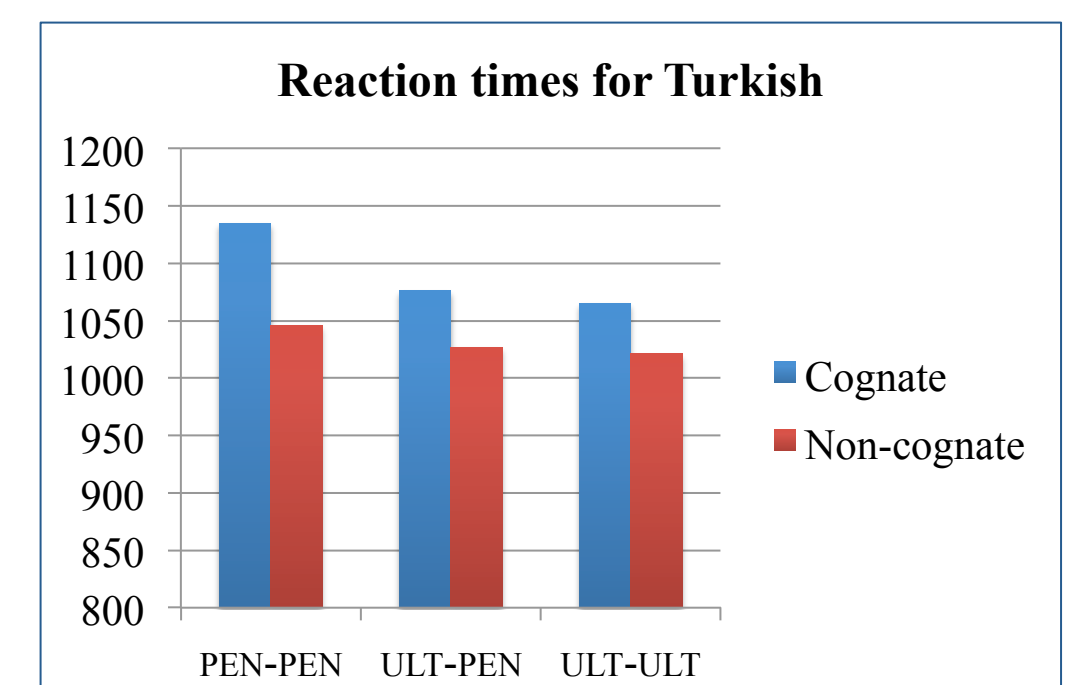
Dutch:

- Interaction between Cognate status and Stress condition: Significant difference between PEN-PEN and ULT-PEN ($p = .035$) and between ULT-ULT and PEN-PEN ($p = .032$) → Cognate facilitation for ULT-PEN and ULT-ULT, but not for PEN-PEN.



Turkish:

- Slower processing in Turkish than in Dutch.
- Slower processing of cognates than non-cognates, in all conditions.
- Significant effect of Ultimate stress in Turkish ($p = .018$) (ULT-PEN and ULT-ULT vs. PEN-PEN).



EEG RESULTS

- EEG measurements from 32 channels.
- ANOVAs with repeated measures, with factors: Word, Cognate status, Stress condition.
- Electrode site:

- Midline (Fz, FCz, Cz, Pz)
- Quadrants:
 - Left frontal (F3, FC1, FC5)
 - Right frontal (F4, FC2, FC6)
 - Left parietal (P3, CP1, CP5)
 - Right parietal (P4, CP2, CP6)

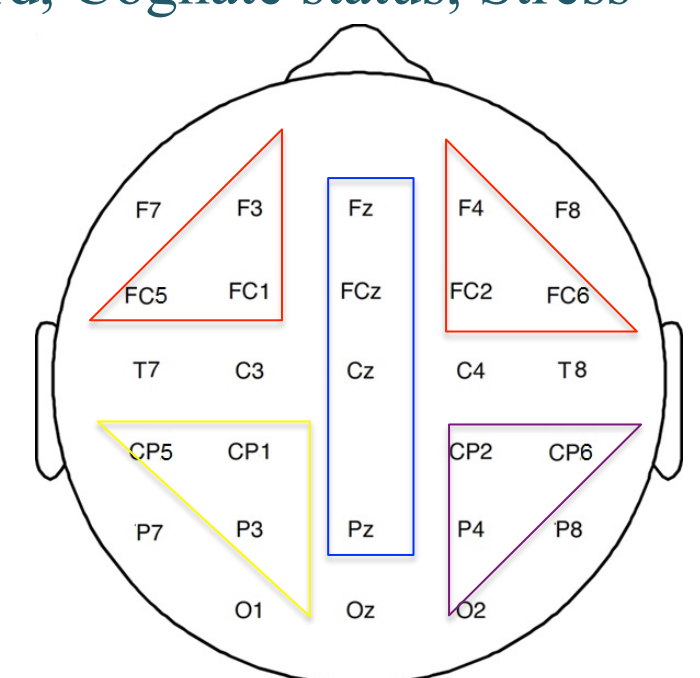


Fig. 2. EEG measurements.

- Mean amplitude

Dutch:

- Larger N400 for non-words than words.
- Larger N400 for non-cognates than for cognates.
- Cognates: N400: PEN-PEN > ULT-PEN > ULT-ULT (Fig. 3).
- Non-cognates: Larger N400 for PEN-PEN and ULT-PEN than for ULT-ULT.

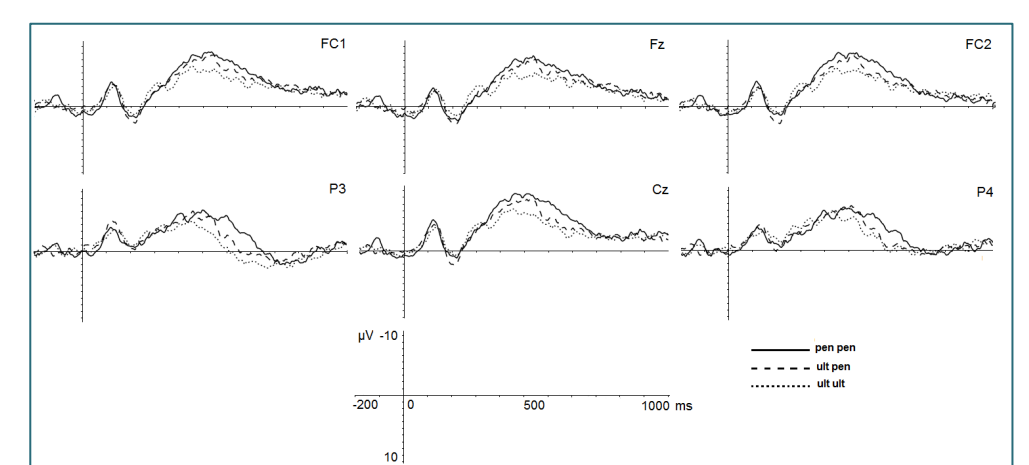


Fig. 3. Grand averages of ERPs for three stress conditions within cognates (Dutch).

Turkish:

- Larger N400 for non-words than words.
- No significant differences between cognates and non-cognates.
- Cognates: Larger N400 for PEN-PEN (Fig. 4).
- Non-cognates: Larger N400 for PEN-PEN and ULT-PEN than for ULT-ULT.

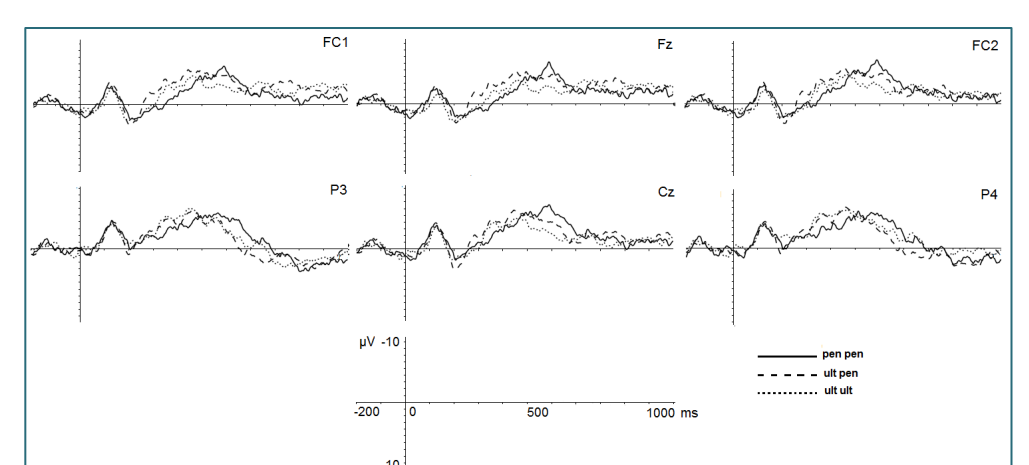


Fig. 4. Grand averages of ERPs for three stress conditions within cognates (Turkish).

CONCLUSION

- Processing difference between cognates and non-cognates, but the direction of the effect (facilitation or inhibition) depends on L1 status/language dominance.
- Findings differ somewhat from visual studies with unbalanced, late bilinguals.
- Effect of word stress position: more difficulties with PEN PEN, in both languages.
- Implications for theories on bilingual word processing.