

# The role of orthographic information in the auditory processing of novel L2 words

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## INTRODUCTION

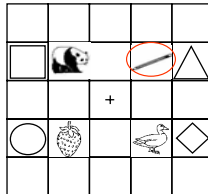
- L2 learners have difficulty in perceiving and producing novel L2 sounds (e.g. English /æ/-/ɛ/ is difficult for Dutch listeners)
- Less is known as to whether this problem has consequences for learners' lexical representations of words containing such sounds

**Are pairs of words that differ minimally with respect to a novel contrast encoded as homophones in the learner's lexicon?**

## L2 PERCEPTION & LEXICALIZATION

- L2 learners experience patterns of lexical activation that are consistent with homophonous lexical representations of L2 minimal pairs (Pallier et al. 2001; Cutler & Otake 2004)
- Do these results reflect lexical representations and/or perception?
- Weber & Cutler (2004) used eye-tracking to separate these two issues
- Dutch-English bilinguals exhibit an *asymmetric* word recognition pattern:

They look at the picture of a *pencil* when they hear [pændə]



But not at *panda* when they hear [pændə]

- Conclusion: They perceive English /æ/ and /ɛ/ as /ɛ/ and initially activate lexical items containing /ɛ/ regardless of which they hear

- Contrastive lexical representations explains the asymmetry

**How can learners lexically encode a contrast that they do not accurately perceive?**

- Knowledge of the spelled forms (Cutler et al. 2006)?
- In the case of Dutch learners of English, the letters 'a' and 'e' may be a cue to the /æ/-/ɛ/ contrast (e.g. 'bet' vs. 'bat')

## RESEARCH QUESTION & HYPOTHESIS

- Question:** Do spelled forms help L2 learners establish contrastive lexical representations?
- Hypothesis:** If orthography helps, subjects should exhibit asymmetric lexical activation only when spelled forms are available

## ACKNOWLEDGMENTS

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## WORD LEARNING & EYE-TRACKING STUDY

### Listeners

- 50 native Dutch speakers, with high proficiency in English

### Auditory & Visual Stimuli

- 20 English nonwords and their pictured meanings



### Word Learning Conditions

- Two word learning conditions (25 listeners each)
- In both conditions subjects heard the same auditory stimuli but saw different displays on the screen

#### Auditory Forms Only



Subjects in both conditions heard: [tɛnzə]

#### Auditory and Spelled Forms

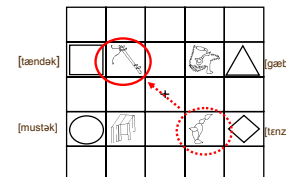


### Word Recognition Task

- Same as in Weber & Cutler (2004) but with the English nonwords



Test: "Click on the [tændək]"



- The circles represent the asymmetric lexical activation expected for the listeners in the Auditory and Spelled Forms condition

## REFERENCES

Cutler, A., A. Weber & T. Otake. 2006. Asymmetric mapping from phonetic to lexical representations in second-language listening. *Journal of Phonetics* 34, 269-284.  
Cutler, A. & T. Otake. 2004. Pseudo-homophony in non-native listening. Paper presented at the *Acoustical Society of America*, New York.

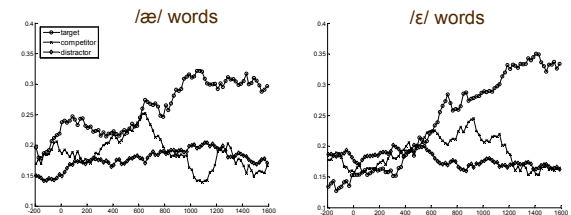
## RESULTS

### Word Learning Conditions

- Learning was initially facilitated by the availability of spelled forms, but both groups performed equally well in the last block of learning (92.1% [Auditory Forms Only] and 92.9% [Auditory and Spelled Forms] correct, chance = 25%)

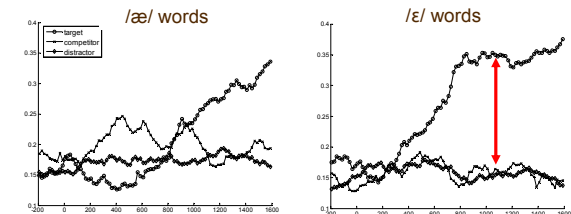
### Word Recognition Task

- Subjects in the Auditory Forms Only condition exhibited a symmetric pattern of lexical activation:



- This indicates that they accessed the same lexical representations whether they heard /æ/ or /ɛ/  
→ **No differentiation of /æ/ and /ɛ/ words in the lexicon**

- However, subjects in the Auditory and Spelled Forms condition exhibited the asymmetric pattern of lexical activation previously found by Weber & Cutler (2004):



## CONCLUSION

- The availability of spelled forms can result in the establishment of a lexical contrast which can be used in auditory word recognition

Pallier, C., A. Colomé & N. Sebastián-Gallés. 2001. The influence of native-language phonology on lexical access: Exemplar-based versus abstract lexical entries. *Psychological Science* 12, 6, 445-449.  
Weber, A. & A. Cutler. 2004. Lexical competition in non-native spoken-word recognition. *Journal of Memory and Language* 50, 1-25.