

# Lit review for SSLA replication special issue

Speech perception in noise

RAP group

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## Question

- Why is it hard to hear an L2 in background noise?
- Do early learners have more difficulty perceiving speech in noise than monolinguals?

## Previous lit

### AoA

- Mayo, Florentine, & Buus (1997)
- Meador, Flege, & Mackay (2000)
- Rogers, Lister, Febo, Besing, & Abrams (2006)
- Ezzatian, Avivi, & Schneider (2010)
- Shi (2010)
- Tabri, Chacra, & Pring (2011)
- Lee (2014)

### Native vs. non-native

- Borghini and Hazan, 2018;
- Bradlow and Alexander, 2007;
- Scharenborg et al., 2018a

### Level of abstraction

**Phoneme perception** (not word level):

- Broersma and Scharenborg, 2010;
- Cooke et al., 2010;
- Garcia Lecumberri et al., 2006

# NOTES

## Mayo et al. (1997)

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## Scharenborg (2019)

Imperfect knowledge of the language and the presence of background noise interact strongly to our disadvantage

- What constitutes imperfect knowledge?  
Seems unlikely that early bilinguals have imperfect knowledge
- Focus has been on phoneme perception (native advantage)
- More recent studies on word recognition (also native advantage)

Why though? Hard to say because of...

- different studies,
- different research methodologies,
- different stimuli,
- different tasks,
- different noise levels,
- different types of noise,
- different groups of participants,
- different language backgrounds,
- different proficiency levels,
- and NO systematic comparison of these studies

### Most common methodology:

- (16 out of 23 studies in review)
- select a number of different SNRs,
- present the target speech signal at a fixed level of intensity at these different SNRs,
- and calculate the number or percentage of correctly identified words

### Noise types:

- Energetic vs informational masking
- white noise has a larger negative effect on non-native word recognition than pink and aircraft noise.

# MAIN POINT

These studies concluded that even early bilinguals who perform in a native-like way in quiet, are more adversely affected by noise than their monolingual peers, possibly because of interference of their other language(s). However, groups of simultaneous early bilinguals in these studies were often very small ( $N = 3$  in both Mayo et al. and Rogers et al.), so more research is needed to investigate whether these results generalise to larger and other listener groups.

In summary, early bilinguals and high-proficiency non-native listeners perform native-like in quiet and relatively easy listening conditions with low levels of noise. However, in more difficult listening conditions, non-natives perform worse than native listeners, regardless of their proficiency levels and regardless of the method used to determine their proficiency (be it objective or subjective measures). Even early bilinguals are adversely affected by background noise during word recognition compared to monolingual native listeners. **These results show the importance of the age of acquisition of the non-native language and proficiency in the non-native language on listeners' performance in word recognition in noise tasks.** To account for inequivalent proficiency levels and to improve comparability of the results across studies, future investigations into the effect of background noise on non-native listening should include objectively measured individuals' non-native proficiency levels (see also Kilman et al., 2014; Scharenborg et al., 2018a).

## References

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