Perception of spoken language in noise: The role of paradigmatic and syntagmatic information

Marcel Schlechtweg

Carl von Ossietzky Universität Oldenburg

Introduction

Factors affecting the perception of spoken language in noise:

(1) Characteristics of the noise
- Signal-to-noise ratio (SNR)
- Type of noise
- Background babble: Number of talkers; language of the babble

(2) Characteristics of the listener
- Native versus non-native
- Monolingual versus bilingual
- Children versus adults
- Individuals with(out) hearing loss

(3) Characteristics of the linguistic materials
- Unfamiliar native accent
- Non-native accent
- Code-switching
- (Semantic) context
- Frequency of occurrence
- Phonetics/phonology of vowels/consonants
- Syntactic structure

Methodology

- Variation with regard to …
  - … the presence of agreement
  - … the type of agreement
  - … linear precedence
  - … syntactic structure
  - … the noun type

Does this variation affect perception in noise?

Does agreement / which type(s) of agreement support the listener?

These cabs broke down.
- Determiner-noun agreement
- Target (*these*) precedes controller (*cabs*)
- Target and controller = same phrase

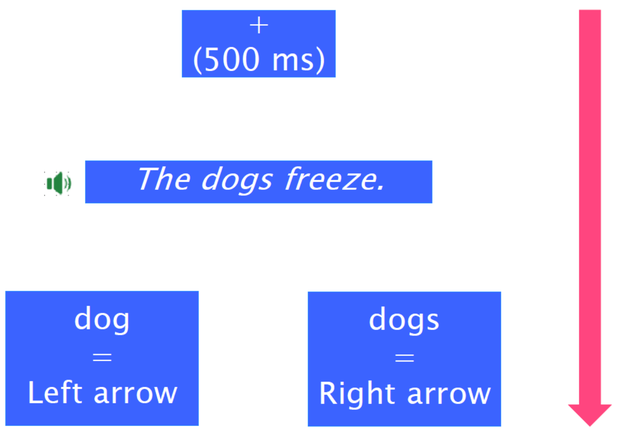
The cabs break down.
- Noun-verb agreement
- Target (*break*) follows controller (*cabs*)
- Target and controller ≠ same phrase

The cabs broke down.
- No agreement

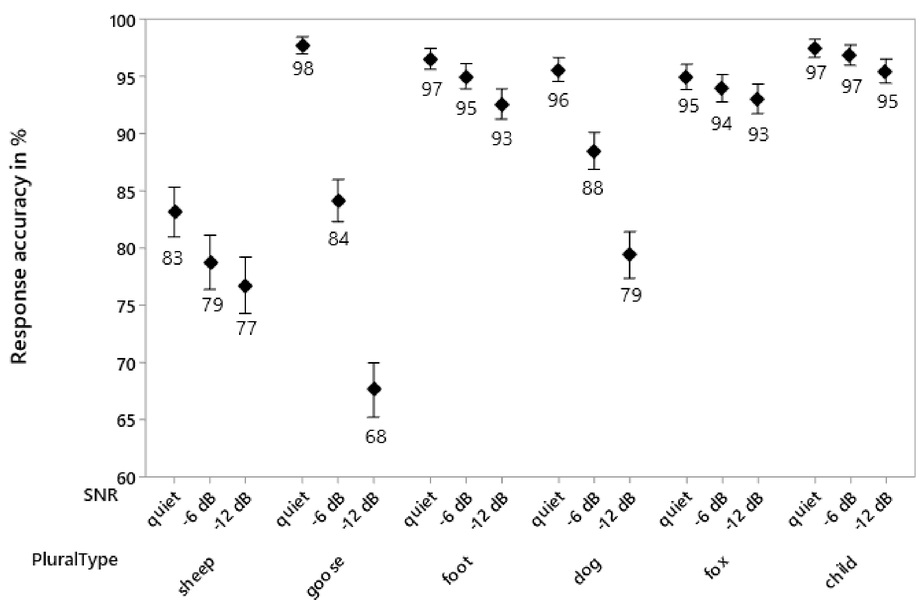
- 43 native speakers of US American English with normal hearing and no other native language (mean age: 30.6 years)
- 6 English nouns with different singular-plural variation
  - Syncretism: *sheep*
  - Vowel change I (vowel fronting only): *goose/geese*
  - Vowel change II (vowel fronting and lengthening): *foot/feet*
  - Suffixation I (maintaining the number of syllables): *dog(s)*
  - Suffixation II (changing the number of syllables): *fox(es)*
  - Suppletion: *child(ren)*

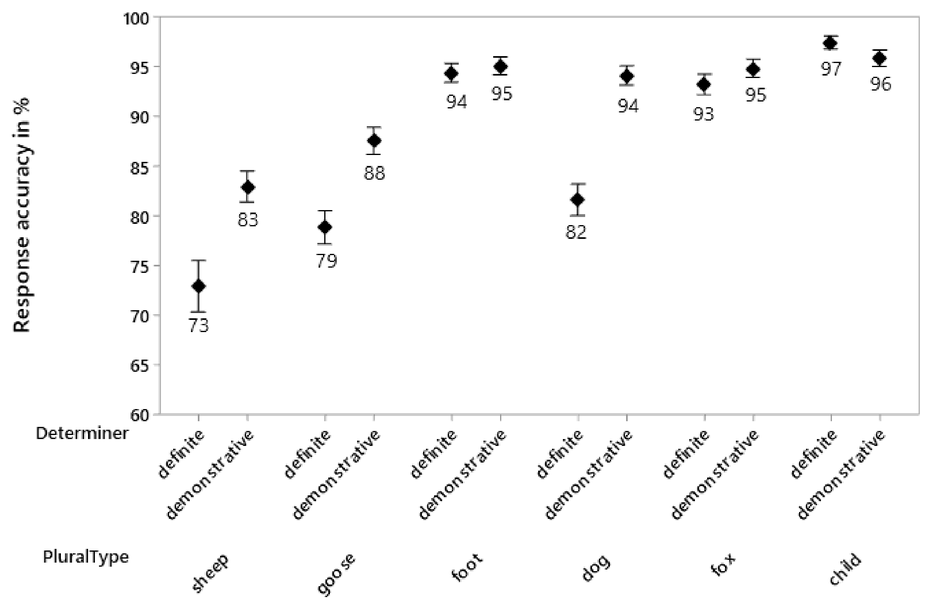
Version and example	Number expressed in determiner	Number expressed in verb form
1. *The goose/foot/dog/fox/child froze.*	No	No
2. *The geese/feet/dogs/foxes/children froze.*	No	No
3. *This sheep/goose/foot/dog/fox/child froze.*	Yes	No
4. *These sheep/geese/feet/dogs/foxes/children froze.*	Yes	No
5. *The sheep/goose/foot/dog/fox/child freezes.*	No	Yes
6. *The sheep/geese/feet/dogs/foxes/children freeze.*	No	Yes
7. *This sheep/goose/foot/dog/fox/child freezes.*	Yes	Yes
8. *These sheep/geese/feet/dogs/foxes/children freeze.*	Yes	Yes

- Sentences manipulated using the variables …
  - PluralType (*sheep*, *goose/geese*, *foot/feet*, *dog(s)*, *fox(es)*, *child(ren)*)
  - Determiner (definite (*the*), demonstrative (*this/these*))
  - VerbTense (present, past)
  - Number (singular, plural)
  - SNR (quiet, -6, -12 dB) (white noise)
- All participants tested on all sentences in all conditions (690 trials)



Results





For more details, references, etc., see:

Schlechtweg, Marcel. 2024. Morphosyntactic agreement in English: Does it help the listener in noise? *English Language and Linguistics.* FirstView.
Schlechtweg, Marcel. 2024. The interaction of paradigmatic and syntagmatic properties during the perception of spoken English in noise. Submitted.