

## Title: **The Pragmatic-Phonetics Interface: Inferences about pronouns influence phonetic category perception**

Session: **General**

Keywords/subfield: **pragmatics, phonetics**

The question of whether and to what extent information from different linguistic levels interacts during language processing remains unresolved. A modular view holds that language comprehension proceeds through a series of hierarchical steps whereby listeners interpret the acoustic signal, build morpho-syntactic structure, and finally decode higher-level semantic and pragmatic properties of the message. Conversely, interactionist models maintain that cues from these linguistic levels contribute to interpretation at any other level, such that top-down cues affect bottom-up perception. Previous research has focused mainly on top-down lexical effects (e.g. Ganong, 1980). Here, we explore whether these effects span processing levels by testing the effect of pragmatics, the topmost level, on phonetic perception, the bottommost. We conducted a phonetic category perception experiment in which (i) pragmatic inference guides expectations about pronominal coreference and (ii) the pronouns are acoustically ambiguous. The goal is to establish whether listeners' top-down discourse expectations about which individual will be mentioned next can influence their bottom-up perception of speech.

**Design:** Sentences contained *implicit causality* (IC) verbs, then a pronoun whose initial consonant was acoustically ambiguous. IC verbs guide listeners' coreference expectations such that verbs like *offend* and *deceive* in (1-2) are subject-biased, since listeners infer the cause of the event is subject of the IC verb. Verbs like *reproach* and *help* in (3-4) are object-biased, since listeners infer that the object is central to the cause of the event.

- (1) [subject] **Abigail** annoyed Bruce because **Xe** was in a bad mood. → *she*-biased
- (2) [subject] **Tyler** deceived Naomi because **Xe** couldn't understand the situation. → *he*-biased
- (3) [object] Luis reproached **Heidi** because **Xe** was getting grouchy. → *she*-biased
- (4) [object] Joyce helped **Steve** because **Xe** was working on the same project. → *he*-biased

The novelty of this design stems from the fact that the English masculine and feminine subject pronouns (*he/she*) begin with fricatives. We created acoustically ambiguous pronouns that varied along the continuum from /hi/ to /ʃi/. (The continuum was validated by replicating the lexical Ganong effect). Our question is whether encountering a female-biasing context (1, 3) will make listeners more likely to perceive these ambiguous pronouns, Xe, as an instance of the word *she*. Likewise, will encountering a male-biasing context (2, 4) make listeners more likely to perceive the word *he*?

We followed up this experiment by exploring the time-course of the effect. Participants heard gated portions of the pronoun at multiple time-points to assess whether it obtains only when determining the word, or earlier in processing.

**Results:** Listeners indicated whether they heard *he* or *she* on a 4-point scale. As predicted by an interactionist model, the results show that female-biasing contexts did yield higher *she* ratings (3.4) compared to male-biasing contexts (3.2;  $F(1,12)=17.74$ ,  $p<0.01$ ; Figure 1). These results extend existing work on phonetic category perception showing that perception is sensitive not only to previously identified cues such as lexical status and prosodic boundaries, but also to discourse-level pragmatic cues. Furthermore the time-course results suggest this effect is present at the earliest stage of processing, reflecting expectation, and again at the final resolution of ambiguity processing the word (Figure 2).

Thus, we show that the range of interacting cues is larger than previously thought and that phonetic perception interacts with higher-level causal inferencing about events and coreference across clauses in a discourse.

Words: 490

Figure 1: Pragmatic bias on phonetics category perception for mbiguous stimulus ranging from *she* to *he*

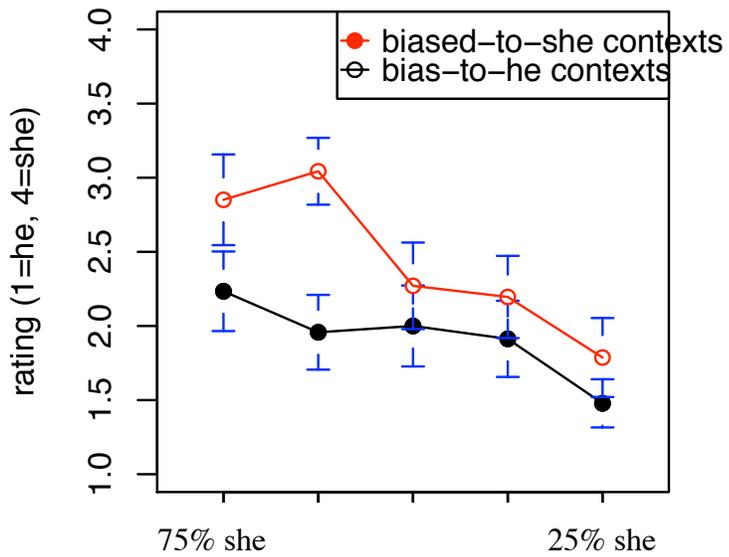


Figure 2: Time course of pragmatic influence on phonetic category perception

