L1 Gender Influences Lexical Competition in L2 Listening

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Background

- Phonological competition in L1 spoken-word recognition has been confirmed by numerous eyetracking studies (e.g., Tanenhaus et al. (*Science*, 1995): Upon hearing the *candy*, English listeners fixate the competitor-picture of a *candle* more often than the pictures of phonologically unrelated distractors.
- Moreover, it is known that morphosyntactic gender information influences spoken-word recognition in L1 (Dahan et al., *JML*, 2000): Upon hearing *"le$_{[masc]}$ bouton$_{[masc]}$"* ('the button'), French listeners do not fixate the picture of a gender-mismatching competitor (*bouteille$_{[fem]}$*, 'bottle') more than distractor pictures. By comparison, when the gender-neutral plural *les$_{[pl\text{-}neutral]}$* precedes *boutons$_{[masc\text{-}pl]}$*, the picture of 'bottles' is taken into consideration.

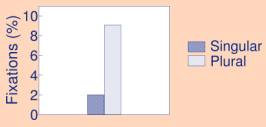

Figure 1: Effect of preceding gender information in Dahan et al. (2000), expressed as mean percentage advantage in fixations to competitor over distractor for gender-marked singular and gender-neutral plural (time window 300-700 ms after target onset).

- For L2 listening, phonological competition between languages has also been confirmed with eyetracking (Weber & Cutler, *JML*, 2004): Dutch listeners fixate the picture of a 'lid' (*deksel*) when they are asked in English to click on the picture of a *desk.*
- The present study examined the role of **gender knowledge in L2 listening** for French and German participants. In particular, use of L1 versus L2 gender info and status of cognates versus non-cognates was tested.

Method

- Head-mounted eyetracking
- The participants were proficient second-language learners and native control listeners
- Participants were asked to mouse-click on one of four pictures
- Displays:

Target (the object the participants were asked to click on, preceded by the correct, gender-marked, definite article): e.g. French *"le$_{[masc]}$ radis"*, 'the radish' (see Exp. 3)

Competitor (an object whose name overlaps in onset with the target in L1 and/or L2, never mentioned in the instructions): e.g. German *Rakete*, 'rocket' (see Exp. 3)

2 unrelated distractors: E.g. 'armchair' (French *fauteuil*, German *Sessel*) and 'feather' (*plume* or *Feder*)

- Two conditions:
  - *Different-gender condition*: Target and competitor of different genders in either L1 or L2
  - *Same-gender condition*: Target and competitor of the same gender in both languages
- Experimental trials alternating with an equal amount of fillers
- Post-hoc proficiency test: Participants had to indicate the gender of all targets and competitors
- Fixation proportions were computed in 10 ms slices for each picture type and then averaged for the time-frame from 200 to 600 ms after noun onset. We observed whether the competitor was activated or not depending on its gender in L1 and L2, by comparison with nouns unrelated to the target (distractors).

Experiment 1 (Paris & Weber, AMLaP 2004): Can L2 listeners use L2 gender information when recognizing cognate nouns?

- The experiment was run in French. 20 German-speaking L2 learners of French took part and 12 French-speaking natives formed the control group.
- *Different-gender condition:*
  - While hearing the French target *"la$_{[fem]}$ cassette$_{[fem]}$"* ('the cassette'), German-speaking participants fixated a picture of the competitor 'canon' (German *Kanone$_{[fem]}$*), although in French, in which the experiment was run, the competitor's gender (*canon$_{[masc]}$*) differed from that of the target and of the article preceding it.
  - Native French speakers did not fixate the 'canon' due to the gender mismatch, thereby replicating Dahan et al. (2000).
- *Same-gender condition:* Whenever the gender of competitor was the same in French and German ('filter', masculine in both French and German, paired with target 'film'), both natives and non-natives fixated the competitor.

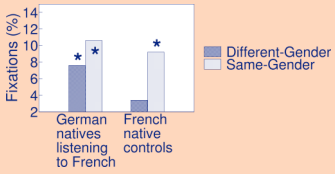

Figure 2: Effect of preceding gender information in Experiment 1, expressed as mean percentage advantage in fixations to competitor over distractor for the different-gender and same-gender conditions (time window 200-600 ms after target onset).

- In Experiment 1, which was run in French, German L2 listeners were not able to use French gender information to reduce the set of word candidates to gender-matching competitors.
- In the case of cognate nouns, L2 participants thus appear unable to use L2 gender to reduce competitor activation.

Experiment 2: (Weber & Paris, CogSci 2004; Paris & Weber, AMLaP 2004): Do L2 listeners use L1 gender information when recognizing cognate nouns?

- The same materials were presented in German to 20 French-speaking late-learners of German. 14 native speakers of German served as controls.
- *Different-gender condition*:
  - French natives who were asked in German to click on the 'cassette' (*"die$_{[fem]}$ Kassette$_{[fem]}$"*) did not fixate the competitor picture of the 'canon', although in the presentation language, German, the competitor (*Kanone$_{[fem]}$*) was of the same gender as the target and the article preceding it. Apparently, the French L2 listeners were using L1 gender information (French *canon$_{[masc]}$*), thus inappropriately restricting the competitor set as a consequence.
  - German native listeners, on the contrary, did fixate the 'canon', since it was a potential continuation of *"die$_{[fem]}$ Ka…"* in their mother-tongue, in which the experiment was run.
- *Same-gender condition*: As in Experiment 1, when the gender of the target and of the competitor was the same in both languages, both listener groups fixated the competitor.

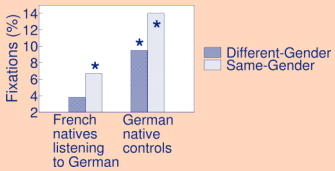

Figure 3: Effect of preceding gender information in Experiment 2, expressed as mean percentage advantage in fixations to competitor over distractor for the different-gender and same-gender conditions (time window 200-600 ms after target onset).

Experiment 3: Do L2 listeners use L1 gender information when recognizing non-cognates?

There is evidence that cognate nouns may have a different status in the bilingual lexicon. Thus, the results in Experiment 2 may be due to the use of cognate nouns as competitors. In this experiment, we investigated **whether L1 gender also interferes during the recognition of non-cognates in L2.**

- The language of the experiment was French. 18 German natives having learned French as a second-language participated, as well as 12 French natives in the control group.
- *Different-gender condition*:
  - When asked in French to click on the 'radish' (*"le$_{[masc]}$ radis$_{[masc]}$"*), German L1 listeners did not take into consideration the German non-cognate competitor *Rakete$_{[fem]}$* ('rocket'), whose gender did not match that of the French target and its article.
  - French native listeners who did not know any German did not fixate the German competitor, since it did not overlap in onset with the target in their mother-tongue.
- *Same-gender condition*:
  - However, having heard French *"la$_{[fem]}$ table$_{[fem]}$"*, the German participants looked often at the picture of the competitor 'fir' (German *Tanne$_{[fem]}$*), whose German gender agreed with the French target and article.
  - As in the different-gender condition, French native listeners who did not know any German did not fixate the German competitor.

Figure 4: Effect of preceding gender information in Experiment 3, expressed as mean percentage advantage in fixations to competitor over distractor for the different-gender and same-gender conditions (time window 200-600 ms after target onset).

- These results contribute to explain the extra effort involved in L2 listening.
- Just as it is known that L2 listeners cannot inhibit L1 phonology (e.g., Weber & Cutler, 2004), it also seems they cannot inhibit L1 gender.
- However, not using gender to eliminate incorrect word candidates means that the competitor set remains larger; worse, if correct L2 candidates were excluded at first by L1 interference, they may then need to be later recovered at additional cost.