Master's Thesis:

Lexical Gender in Non-Native Spoken-Word Recognition
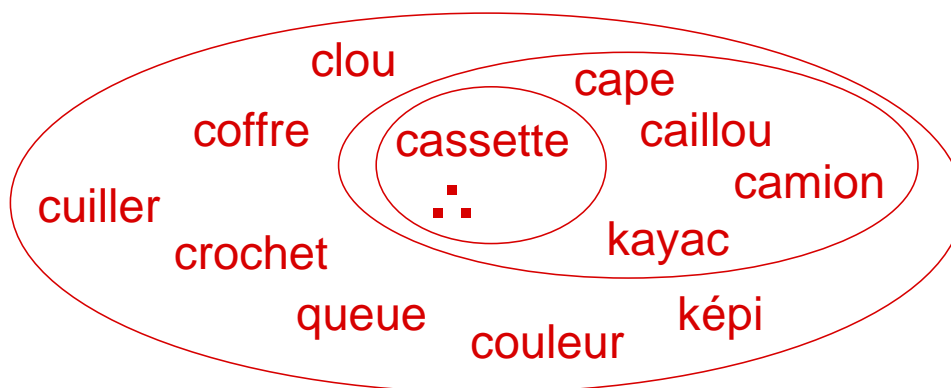
The Origin of the Gender Effect

Garance PARIS
Advisor: Andrea WEBER
Saarland University

Competition in
Spoken-Word Recognition

● Word onset activates a set of words
consistent with acoustic input

● These candidates compete for recognition

● As input unfolds, candidates which become inconsistent
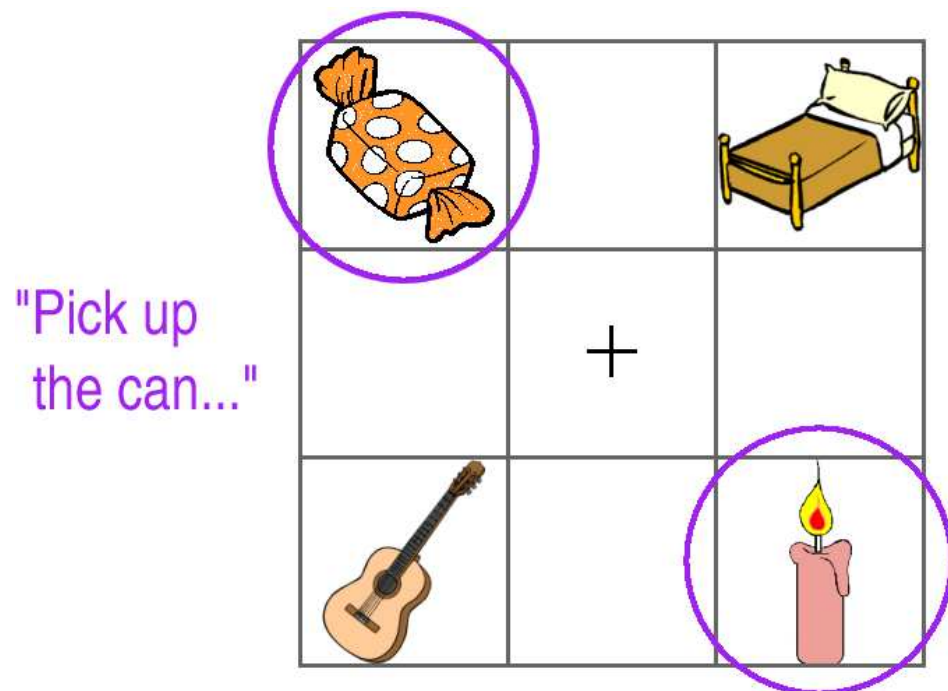drop out of the competitor set

Eyetracking in Visual Worlds

Lexical Competition and Eyetracking

Tanenhaus et al. (1995):

"Pick up the can..."

When participants heard the noun onset /kæn/, they fixated both the picture of a *candy* and that of a *candle*

Influence of Morpho-Syntactic Context

Also with eyetracking, Dahan et al. (2000) showed an influence of morpho-syntactic context:

- French: 2 arbitrary gender classes, masculine & feminine

- Article preceding a noun agrees with it in gender

- *le*   *bouton*   *la*   *bouteille*
  Art$_{[masc]}$ N$_{[masc]}$ Art$_{[fem]}$ N$_{[fem]}$
  'the button'   'the bottle'

Gender <u>Can</u> Restrict the Competitor Set

Dahan et al. (2000):

- Following a gender-marked article, gender-mismatching competitors are not activated

- E. g. after "le $_{[masc]}$ bou...", there were as little looks to *bouteille* $_{[fem]}$ as to the distractors

Target:
bouton$_{[masc]}$

Distractors

Competitor:
bouteille$_{[fem]}$
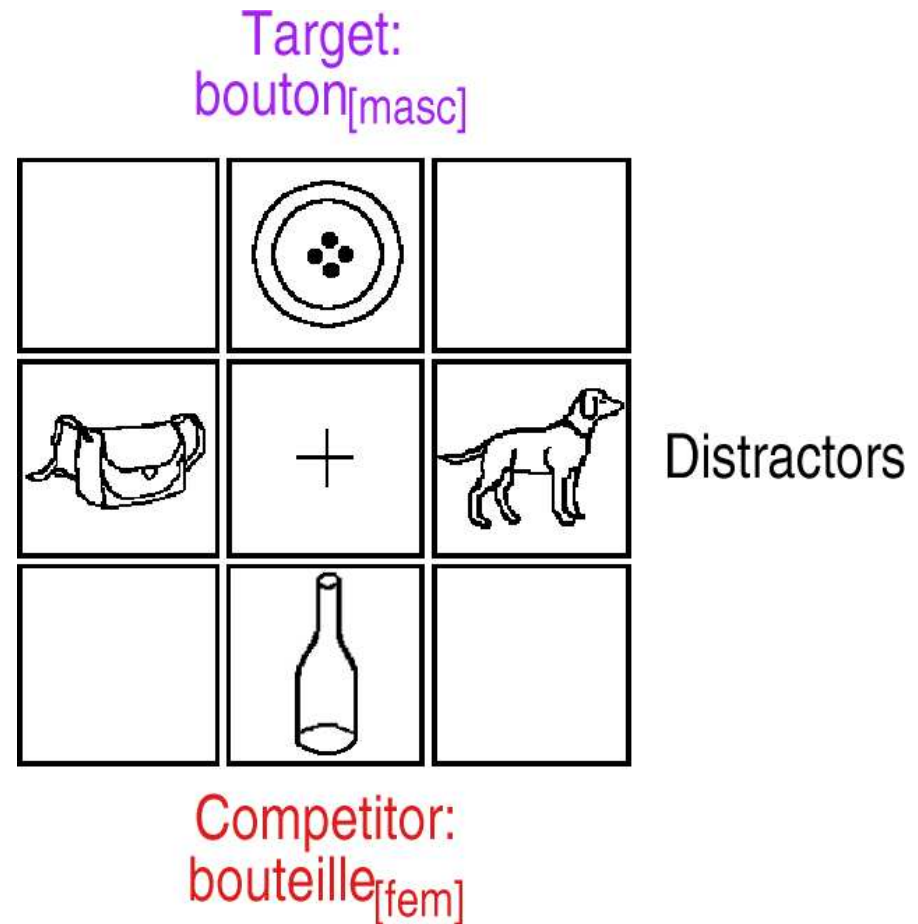
How Does this Effect Arise?

Two possible explanations are (Dahan et al., 2000):

- **Co-occurrence of the forms of articles and nouns** (surface effect):

$$P(\ \text{bouton}\ |\ /\text{bu}/\ ,\ /\text{lə}/)$$

is higher than

$$P(\ \text{bouteille}\ |\ /\text{bu}/\ ,\ /\text{lə}/)$$

- **Co-occurrence of gender categories and nouns** (grammar-based effect):

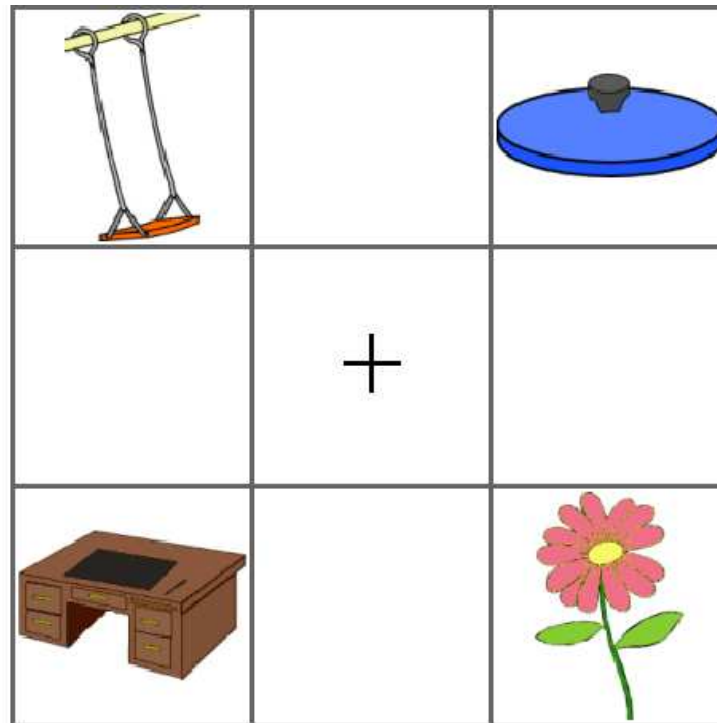$$P(\ \text{bouton}\ |\ /\text{bu}/\ ,\ \text{Art}_{[masc]})$$

is higher than

$$P(\ \text{bouteille}\ |\ /\text{bu}/\ ,\ \text{Art}_{[masc]})$$

Non-Native Spoken-Word Recognition

When listening to foreign language, competitors from the mother-tongue are also activated (e. g. Weber & Cutler, 2004):
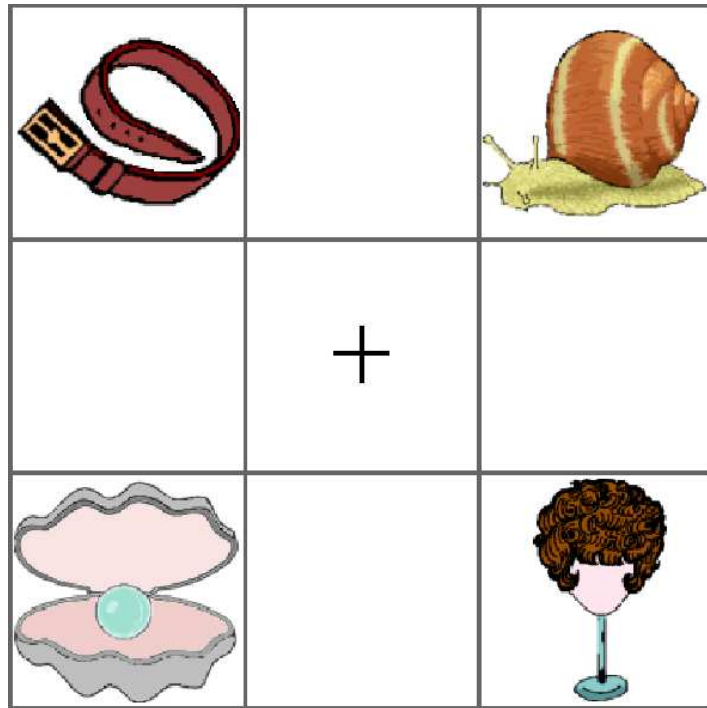
French and German Gender Compared

- Both: masculine & feminine nouns
     (+ neuter in German)

- Definite articles mark gender:

  ▶ French: *le, la*

  ▶ German: *der, die, das*

- Some French-German cognates share gender, some do not

perruque $_{[fem]}$ canon $_{[masc]}$
Perücke $_{[fem]}$ Kanone $_{[fem]}$
"wig"   "canon"

Materials

Target
perle[fem]
Perle[fem]
"pearl"

Competitor
perruque[fem]
Perücke[fem]
"wig"

(a) Same-gender pairs
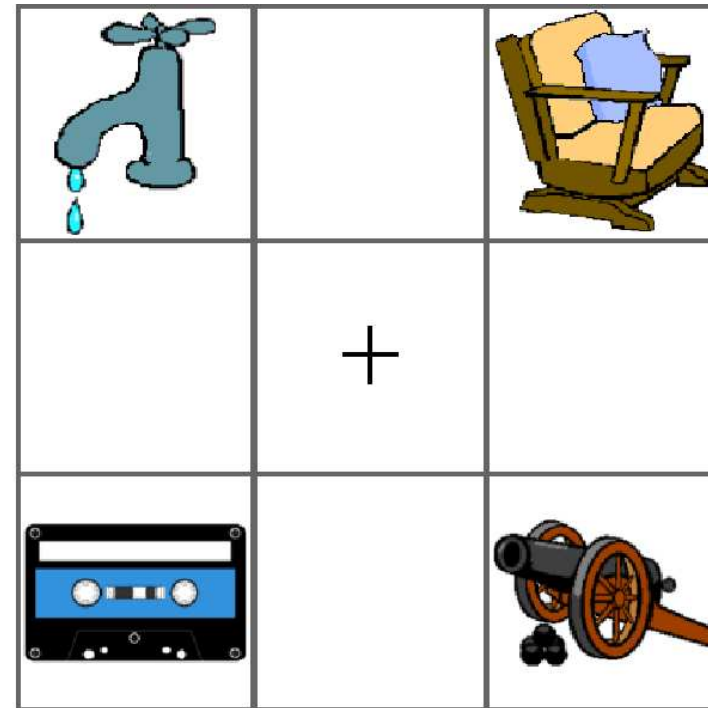
Target
cassette[fem]
Kassette[fem]
"tape"

Competitor
canon[masc]
Kanone[fem]
"canon"

(b) Different-gender pairs

Materials (2)

● **Same-gender pairs:**
Target & competitor shared gender in both
languages
⇒ Neither French nor German gender
could constrain the competitor set
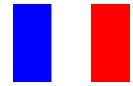(as with *candy/candle*)

perruque[fem]
Perücke[fem]
"wig"

● **Different-gender pairs:**
Target & competitor differed in gender in <u>French</u>,
but not in <u>German</u>
⇒ French gender might exclude competitor
(as with *bouton/bouteille*),
but German gender could not

canon[masc]
Kanone[fem]
"canon"

Experiment 1: French Instructions

- *Cliquez sur le $_{[masc]}$/la $_{[fem]}$...*
  Click   on   the...

- Participants:
  20 proficient Germanophone learners of French
  + 12 native listeners

- Predictions:

  ▶ Same-gender: More fixations to the
    competitor than to distractors for
    both listener groups

  ▶ Different-gender:
    ♦ Francophones should not activate the
      competitor, replicating Dahan et al. (2000)
    ♦ If Germanophones use French gender, they
      should not activate the competitor either

perruque$_{[fem]}$
Perücke$_{[fem]}$
"wig"

canon$_{[masc]}$
Kanone$_{[fem]}$
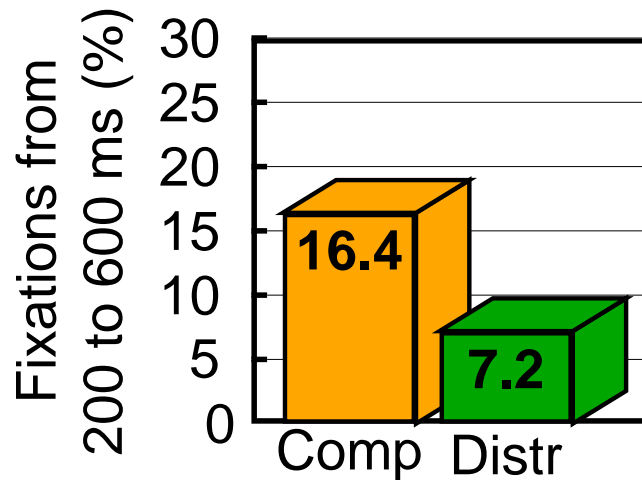"canon"

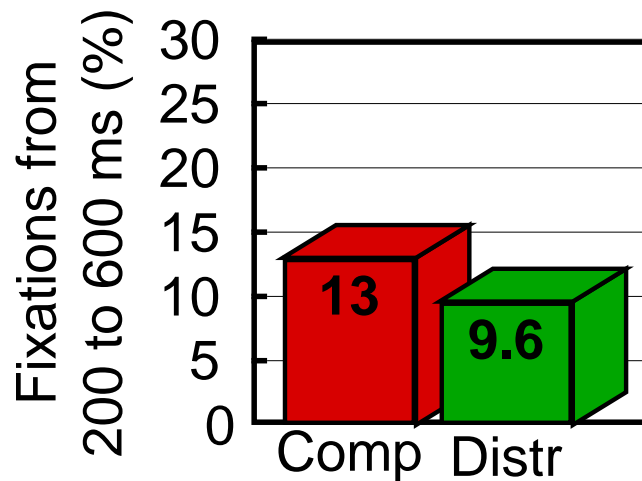# Exp. 1a: Germanophones listening to French

Same-gender
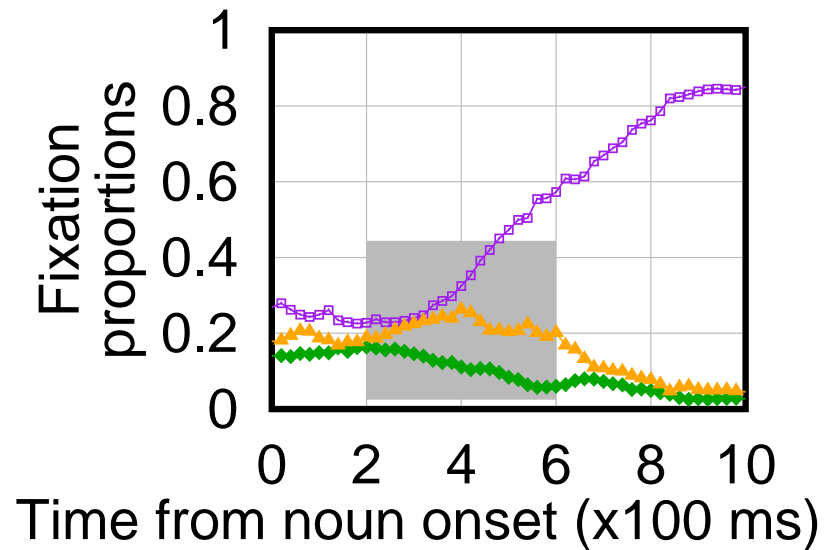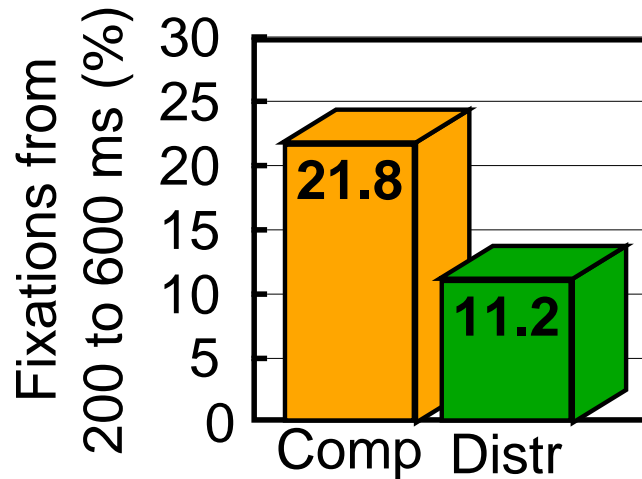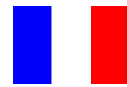

Different-gender

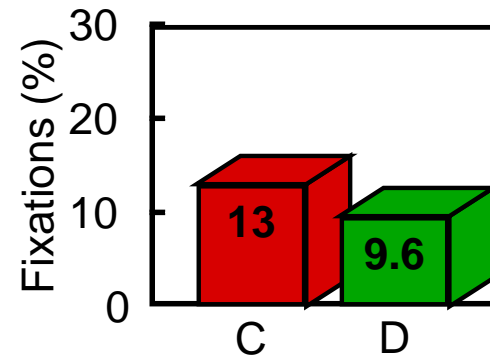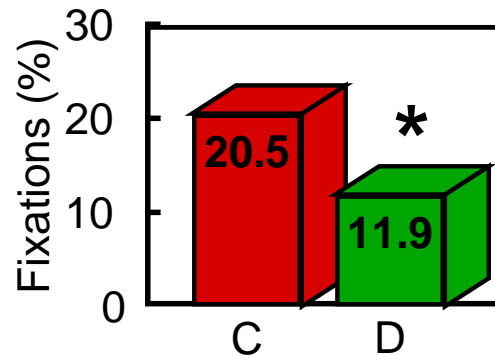# Exp. 1b: Francophones listening to French
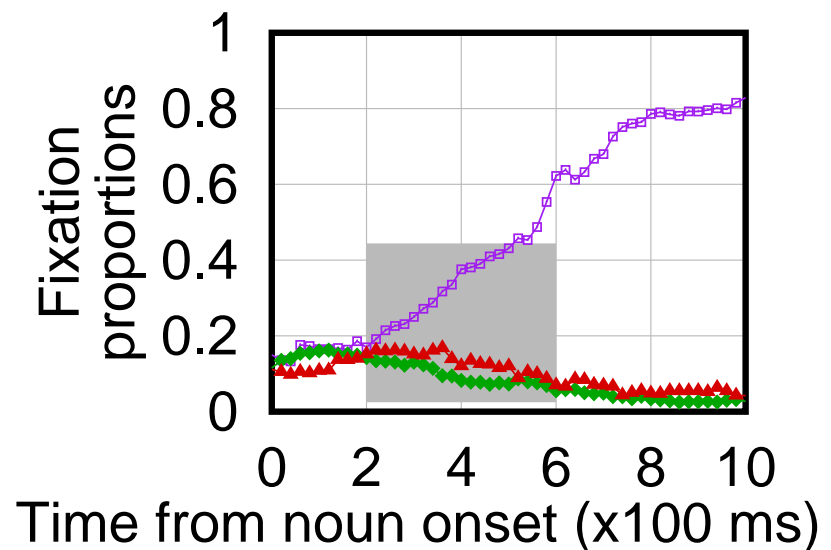
Experiment 1: Results

Non-natives

Natives

- **Non-natives (Germanophones):**
  More fixations to the competitor than to distractors in
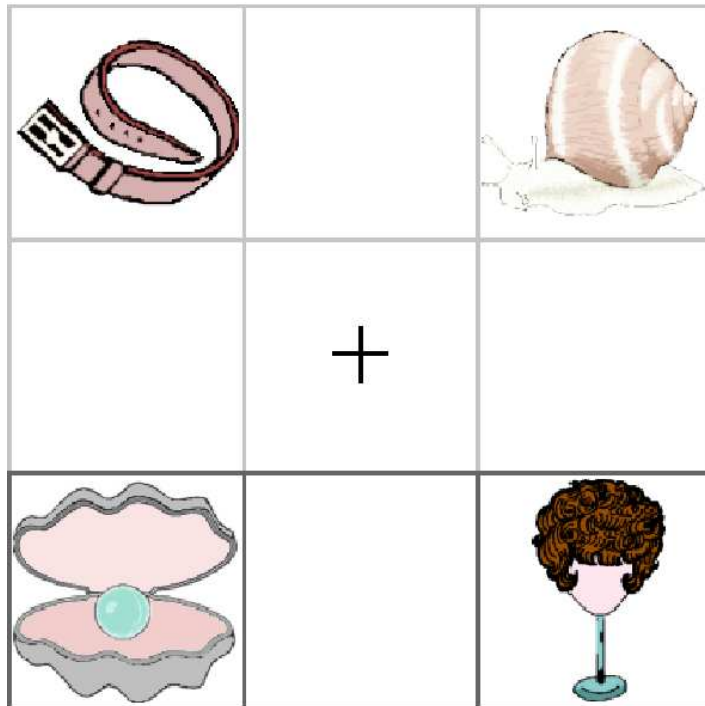 <u>both conditions</u>
  ⇒ In the **different-gender** trials, participants could not use
  non-native gender to eliminate competitor activation

- **Natives (Francophones):**
  Competition for **same-gender** but <u>not</u> for **different-gender** trials
  ⇒ As in Dahan et al. (2000), native listeners made use of
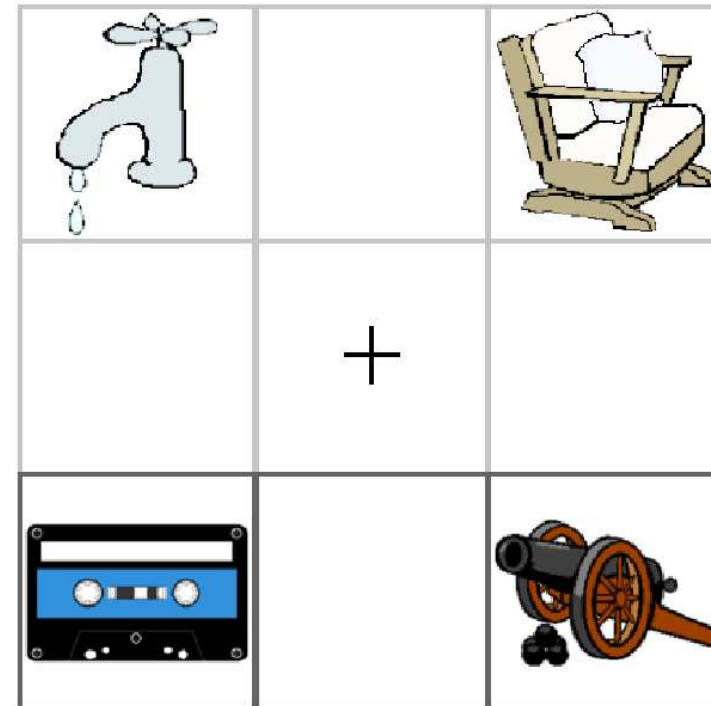 gender to constrain lexical access

Experiment 2: Materials

Target
perle[fem]
Perle[fem]
"pearl"

Competitor
perruque[fem]
Perücke[fem]
"wig"

Target
cassette[fem]
Kassette[fem]
"tape"

Competitor
canon[masc]
Kanone[fem]
"canon"

(a) Same-gender pairs

(b) Different-gender pairs

Experiment 2: German Instructions

- *Wo   befindet sich   der/die...?*
  Where is   the...?

- Participants:
  20 proficient non-natives + 12 native listeners

- Predictions:

  ► Same-gender: Both listener groups should activate the competitor

  ► Different-gender:
  ♦ Germanophones should activate the competitor
  ♦ If Francophones use French gender, they should not activate it

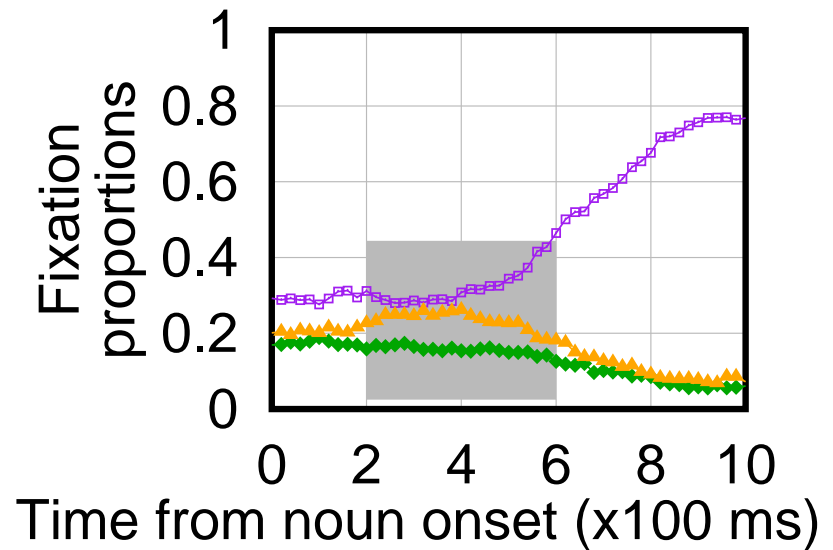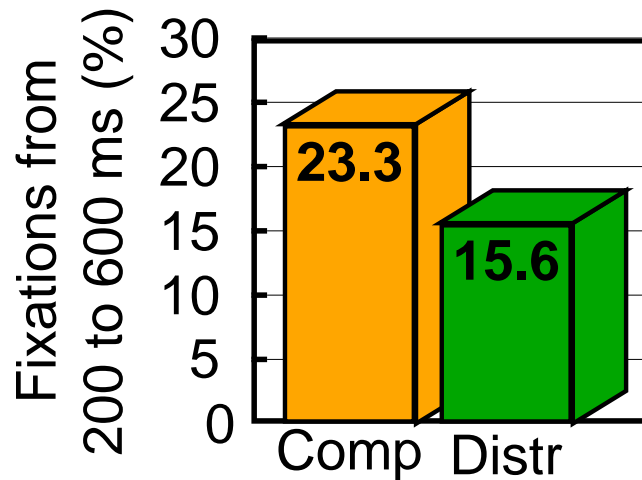Different-gender:

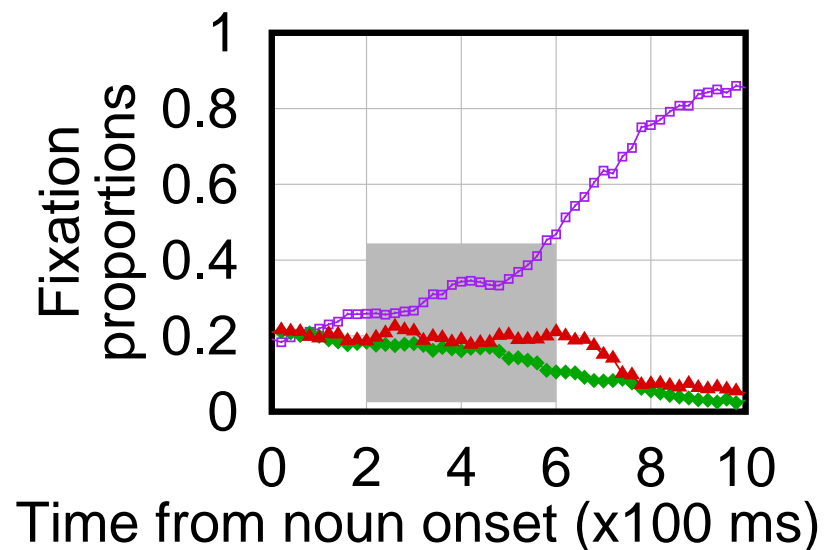Target:
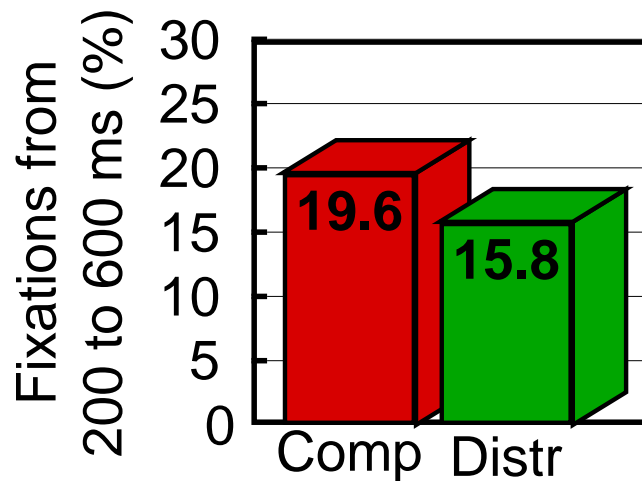cassette[fem]
Kassette[fem]
"tape"

Competitor:
canon[masc]
Kanone[fem]
"canon"

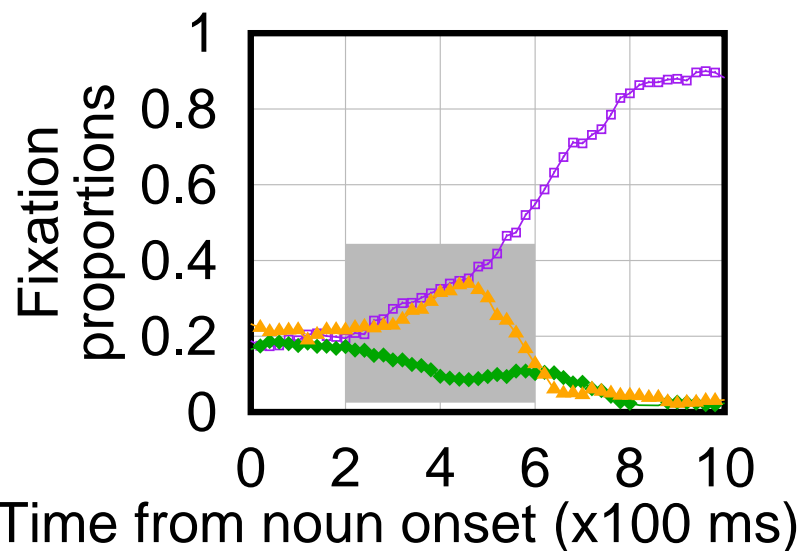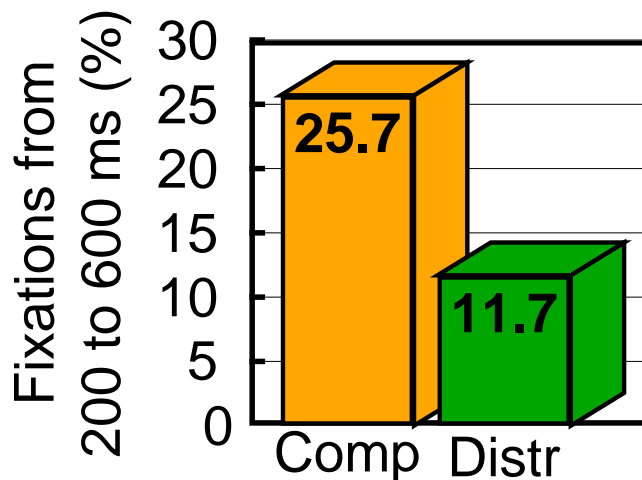# Exp. 2a: Francophones listening to German
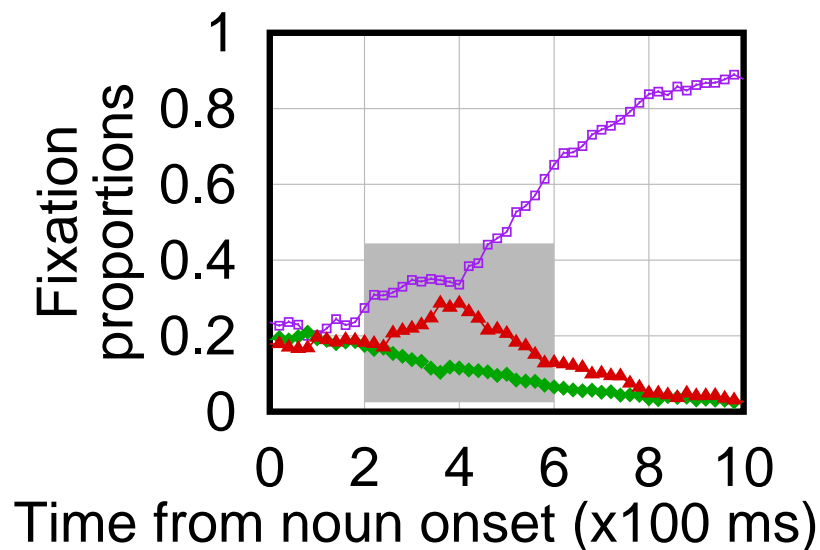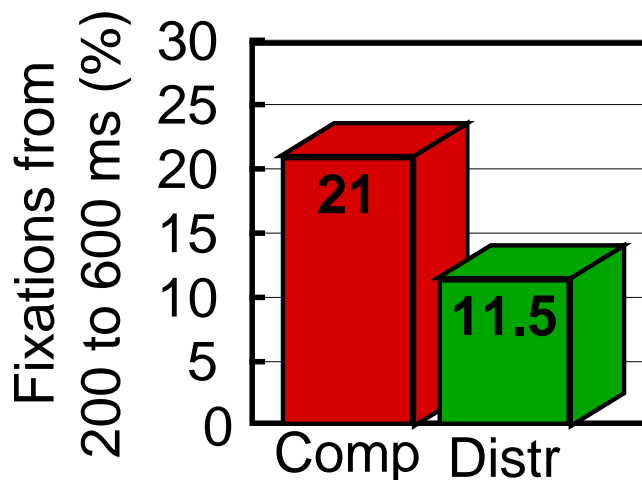
Same-gender

Different-gender

Exp. 2b: Germanophones listening to German

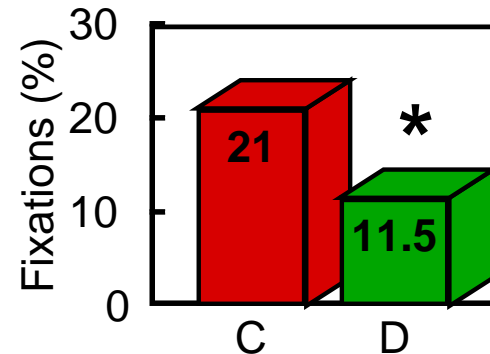**Same-gender**
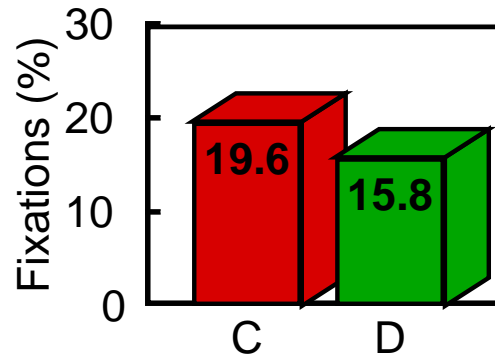

Different-gender

Experiment 2: Results

Non-natives

Natives

- **Non-natives (Francophones):**
Competition <u>only</u> in the **same-gender** trials
⇒ In **different-gender** pairs, natives <u>did</u> use gender,
but not the gender of the presentation language;
instead they used the gender of their mother-tongue

- **Natives (Germanophones):**
Competition in both conditions

Conclusion

- Non-native listeners do not make use of their foreign language's gender to reduce competition,
  even when they know the gender of a word

- Instead, they seem to use the gender of their mother-tongue

- Consequence: Spoken-word recognition requires more effort

- **Origin of the gender effect:**
  Results rather suggest that the gender effect is grammar-mediated, not form-based

Discussion Elements

● How does the gender effect come about?
Through a gender "node"?
How is noun-gender stored in the lexicon in the mother-tongue?
In a 2nd language?

● Our items: mostly cognates, both as targets and as competitors
What about non-cognate competitors?

● What is this late "blip" in data for both groups of non-natives?
Is this before or after word-recognition?