

The bilingual lexicon under Distributed Morphology: An Investigation of gender agreement in code-switching

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Bilingualism and linguistic theory

- ↗ An adequate model of grammar must support the **representation of more than one language**.
- ↗ What is the locus of cross-linguistic variation in grammar?
- ↗ How is language specific information dissociated in a single system?

The bilingual lexicon(s)

Are **lexical items** of different languages integrated or autonomous within the bilingual Language Faculty?

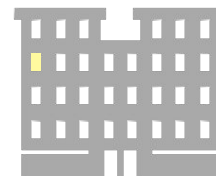
masculine
<i>bayit</i>

<i>house</i>



feminine
<i>dira</i>

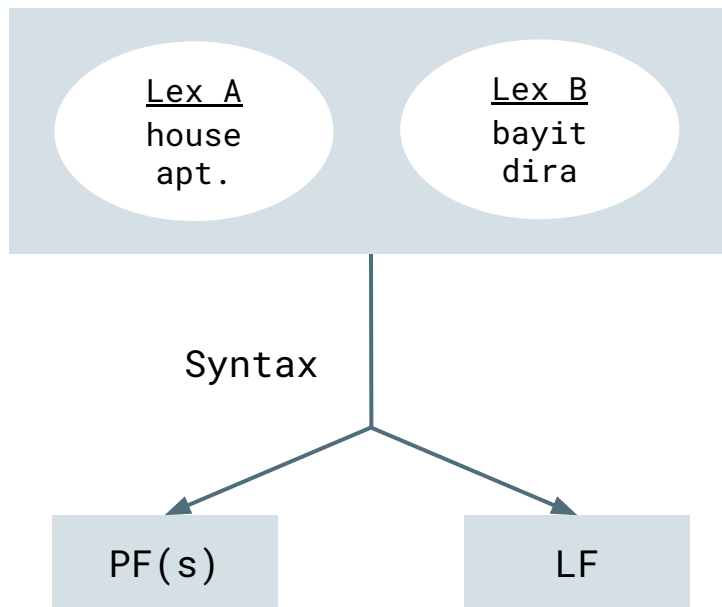
<i>apartment</i>



The bilingual lexicon(s)

Lexicalist architecture (Chomsky 1965, 1981) → Autonomous

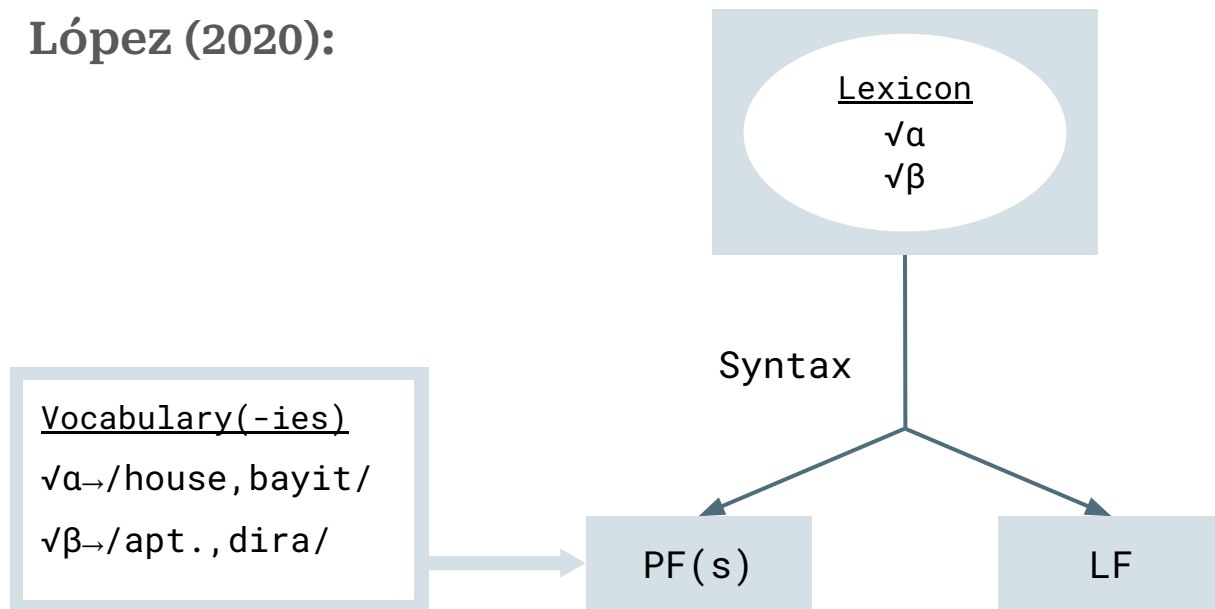
MacSwan (1999):



The bilingual lexicon(s)

Distributed Morphology (Halle & Marantz 1993) → Possibly integrated

López (2020):



Gender agreement in ICS

(1) Their old **apartment** *le'at le'at mitparek-ø/et*
slowly slowly fall.apart-M/F

↪ **Default agreement** (e.g., Jake et al. 2002; Otheguy & Lapidus 2003)

A noun in a non-gendered language may lead to default agreement, which is masculine in Hebrew.



Autonomous
lexicons

↪ **Analogical agreement** (e.g., Liceras et al. 2008)

A noun in a non-gendered language may trigger agreement based on the gender of its translational equivalent, which is feminine in (1).



Integrated
lexicon

Methods

- ↗ Experiment 1: Visual sentence completion (forced-choice)
- ↗ Experiment 2: Auditory sentence completion (forced-choice)
- ↗ Experiment 3: Auditory acceptability judgement task

	Avg.	Std.	Min.	Max.
Dominance (-218 - 218)	-58.93	40.97	-140.39	93.08
Hebrew AoA	0.55	1.49	0	9
English AoA	3.55	2.98	0	11

Materials

concord

We're looking for a {house | apartment} yaxasit

relatively

zol

cheap.M

zola

cheap.F

subj-verb

Their old {house | apartment} le'at le'at

slowly slowly

mitparek

fall.apart.M

mitpareket

fall.apart.F

pronoun

We bought an old {house | apartment} ve-šipacnu

and-renovated

oto

it.M

ota

it.F

Methods

Experiment 1

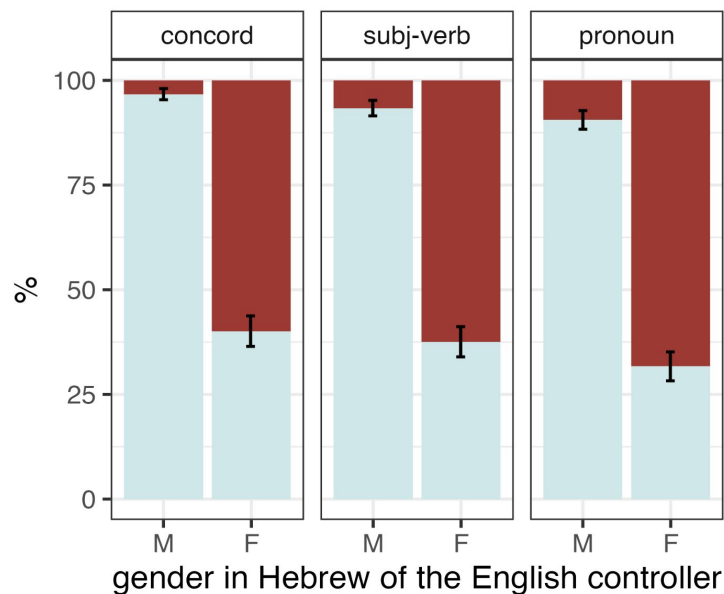
- ~ 52 early Hebrew-English bilinguals (4 excluded).
- ~ **Self-paced reading** centered presentation.
- ~ Binary forced choice (5000ms).

Experiment 2

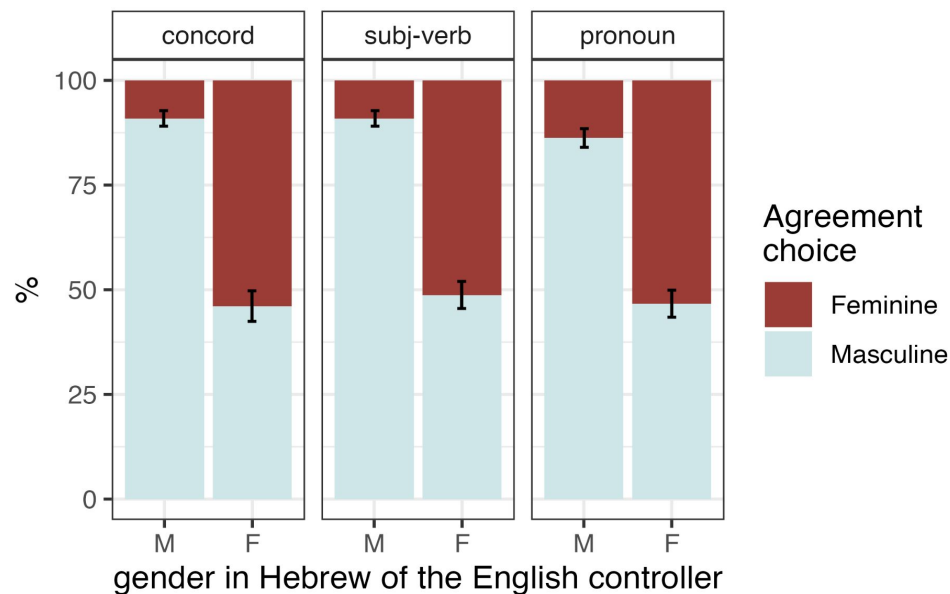
- ~ 69 early Hebrew-English bilinguals (9 excluded).
- ~ Listened to **pre-recorded** sentence preambles.
- ~ Binary forced choice (5000ms).

Results

Experiment 1



Experiment 2



Results

Analogical agreement

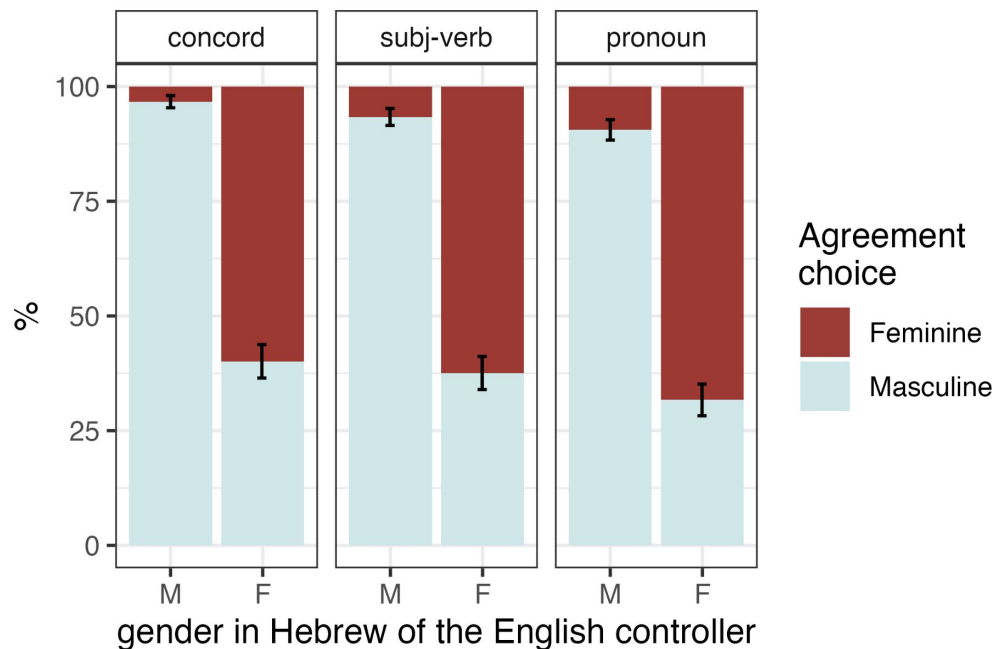
Participants tended to choose Hebrew-matching agreement.

Default masculine

Participants chose less Hebrew-matching agreement with *feminine-* compared to *masculine-in-Hebrew* nouns

Est.	Est. Error	95% CrI lower	95% CrI upper
-1.60	0.32	-2.25	-1.00

Experiment 1



Results

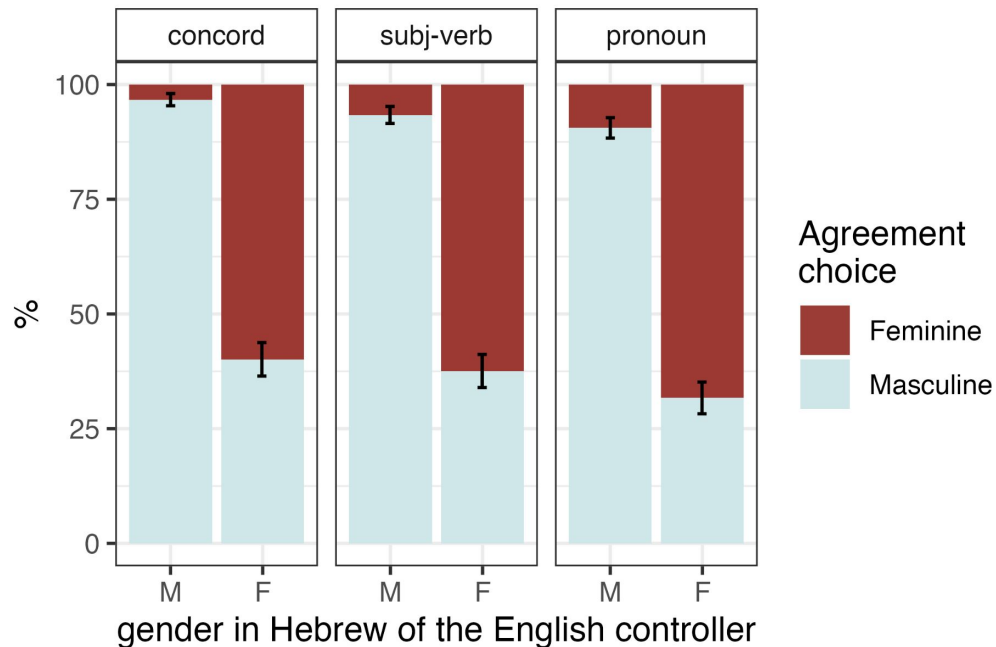
Dependency type

The contrast between *feminine-* and *masculine-in-Hebrew* nouns was **larger** in the *concord* compared to the *pronoun* condition.

In the *concord* condition, there was **less** Hebrew-matching agreement with *feminine-in-Hebrew* nouns, but **more** with *masculine-in-Hebrew* noun.

Est.	Est. Error	95% CrI lower	95% CrI upper
0.25	0.15	-0.07	0.55

Experiment 1



Methods

- ↗ 85 early Hebrew-English bilinguals (11 excluded).
- ↗ Listened to **pre-recorded sentences**.
- ↗ Rated their acceptability on a 6pt scale.



Materials

agreement: {match|mismatch}

concord

We're looking for a house

yaxasit {zol|zola}

relatively cheap.M/F

We're looking for an apartment

yaxasit {zola|zol}

relatively cheap.F/M

subj-verb

Their old house

le'at le'at {mitparek/mitpareket}

slowly slowly fall.apart.M/F

Their old apartment

le'at le'at {mitpareket/mitparek}

slowly slowly fall.apart.F/M

pronoun

We bought an old house

ve-šipacnu {oto|ota}

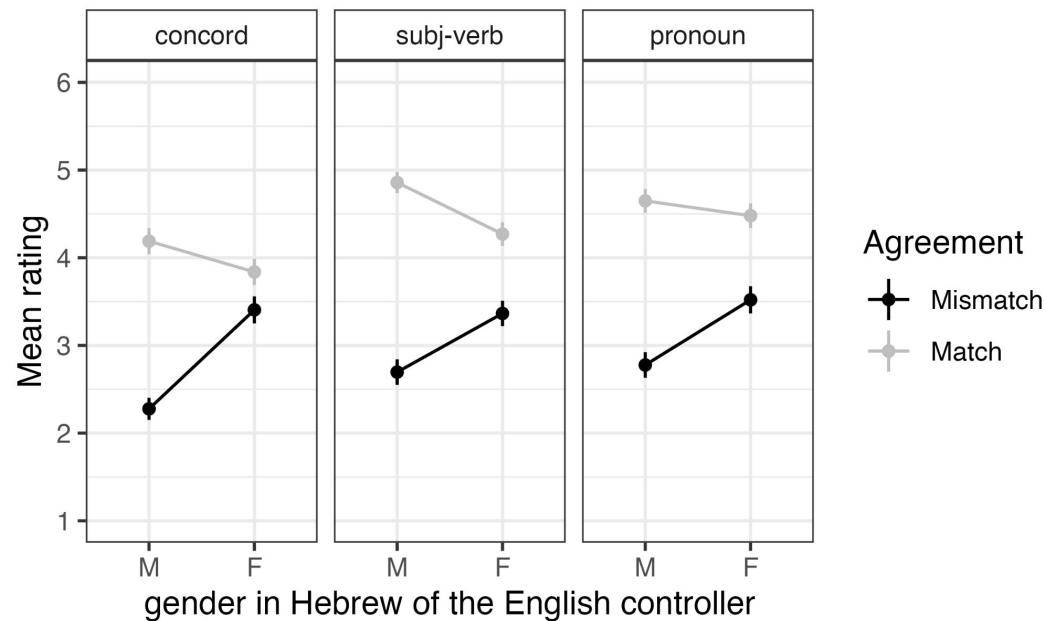
and-renovated $it.M/F$

We bought an old apartment

ve-šipacnu {ota|oto}

and-renovated *it.F/M*

Results

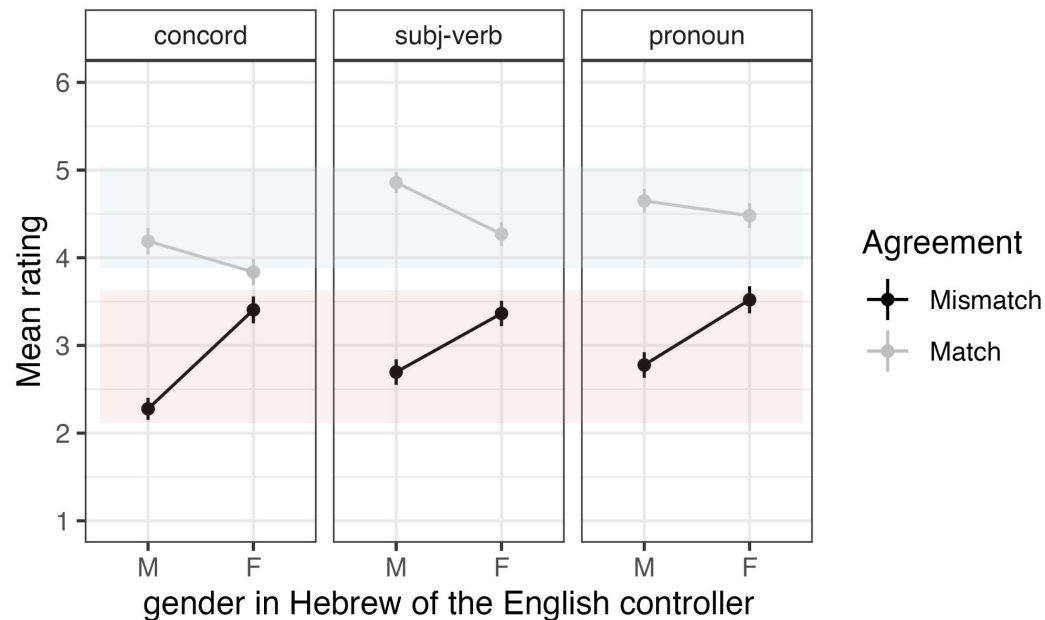


Results

Analogical agreement

Participants prefer Hebrew-matching agreement.

Est.	Est. Error	95% CrI lower	95% CrI upper
0.58	0.08	0.42	0.74

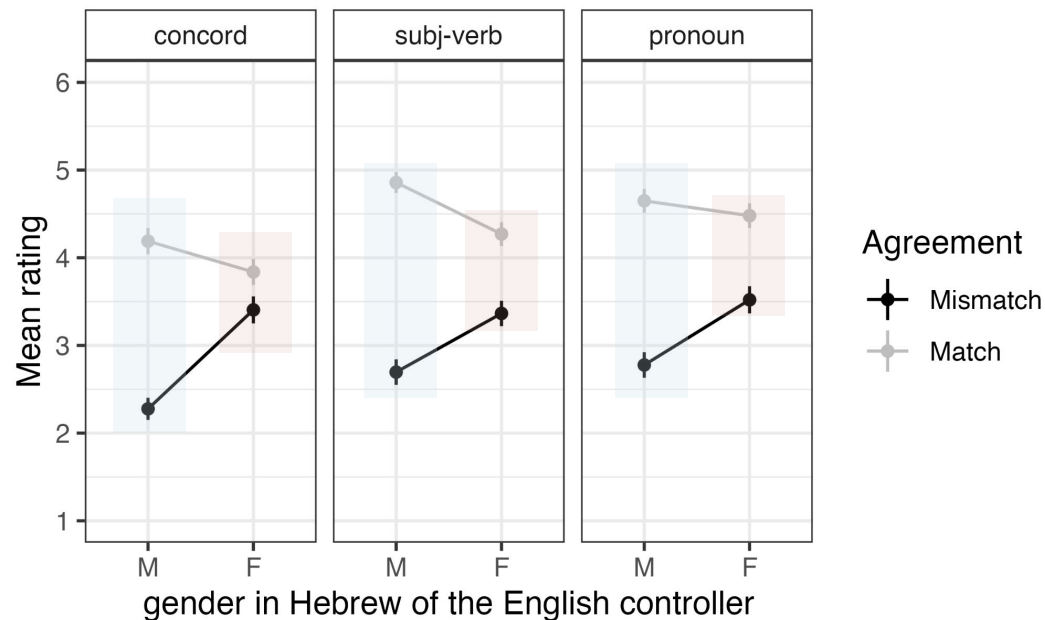


Results

Default masculine

The preference for Hebrew matching agreement was stronger with *masculine*- than *feminine-in-Hebrew* nouns

Est.	Est. Error	95% CrI lower	95% CrI upper
-0.26	0.05	-0.35	-0.17

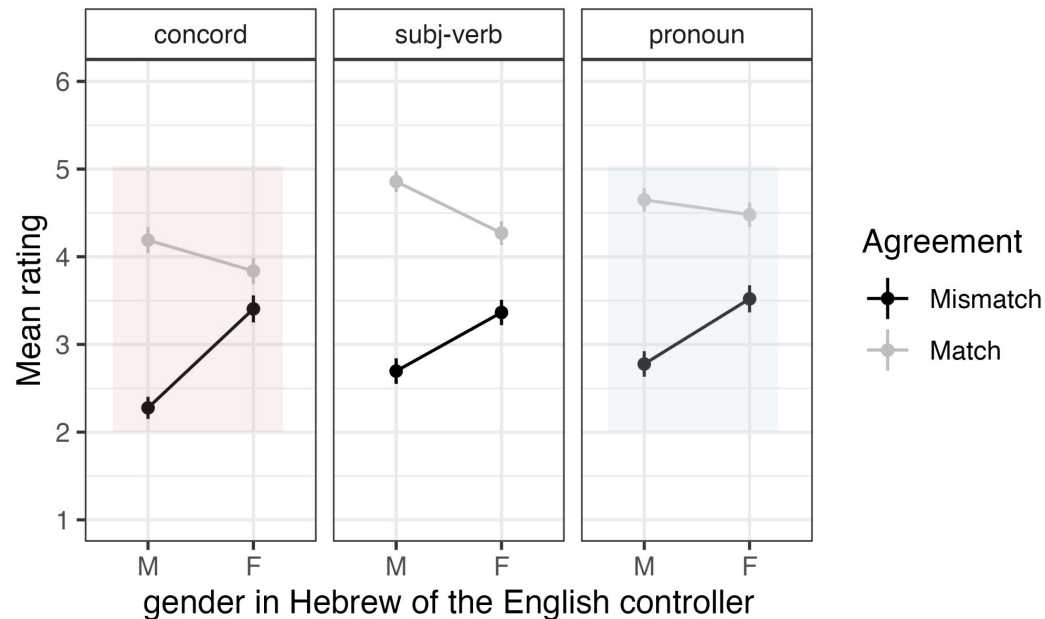


Results

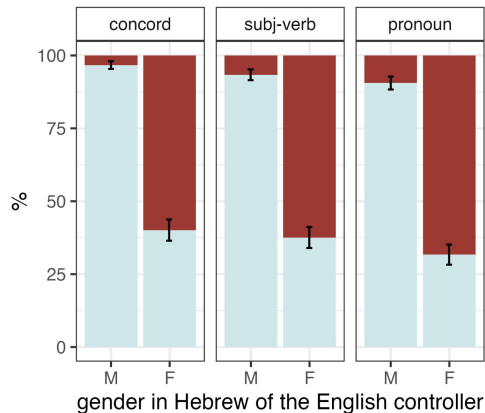
Dependency type

The preference for feminine analogical agreement is larger in the *pronoun* condition compared to the *concord* condition.

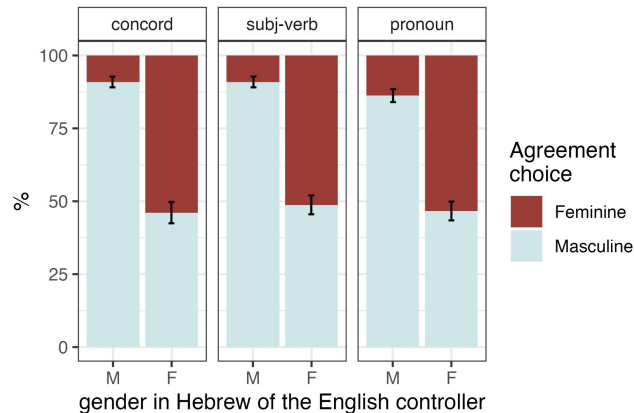
Est.	Est. Error	95% CrI lower	95% CrI upper
-0.38	0.26	-0.80	0.06



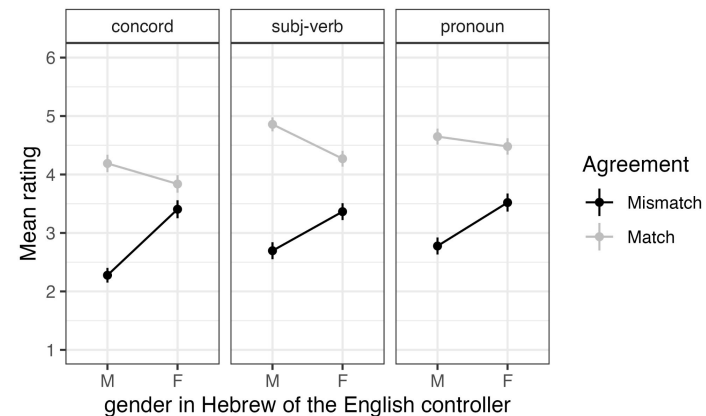
Written sentence completion



Auditory sentence completion



Auditory acceptability judgment



Analogical agreement

Hebrew-English bilinguals prefer Hebrew agreement that **matches the gender of an English noun's Hebrew equivalent**.



Incompatible with autonomous lexicons: The representation associated with an English noun must be marked with the gender of its Hebrew equivalent.

Default agreement

Masculine-in-Hebrew nouns triggered **more** Hebrew-matching agreement (Exp 1-2) & **a larger penalty** for non-Hebrew matching agreement (Exp 3).



Grammatical optionality between a gender marked and a genderless agreement controller?

López (2020)

- ↪ Grammatical gender is represented on the nominal categorizer n (Acquaviva 2009).
- ↪ Bilingual grammar (e.g., Swahili-English) represents the nominal categorizers relevant to each language, distinguished by their features.

Optionality between analogical and default agreement under DM

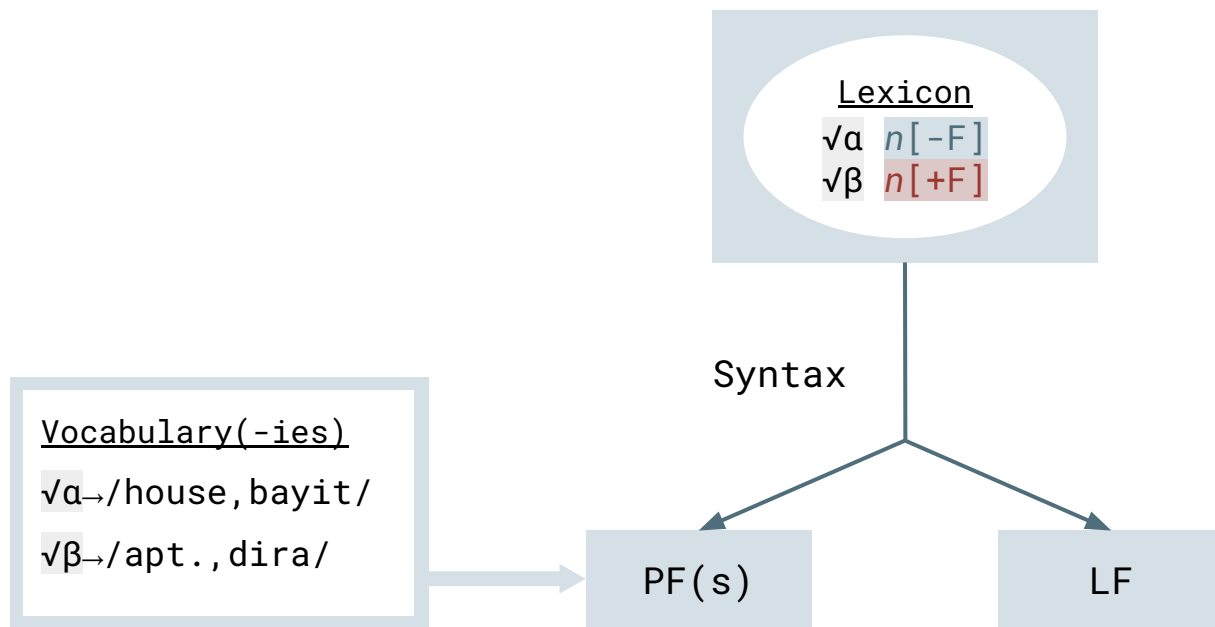
A shared root may combine with either the **English (genderless) n** or the relevant **Swahili n** , endowing it with a noun class.

(cf. Grimstad & Áfarli 2017, Alexiadou et al. 2015)

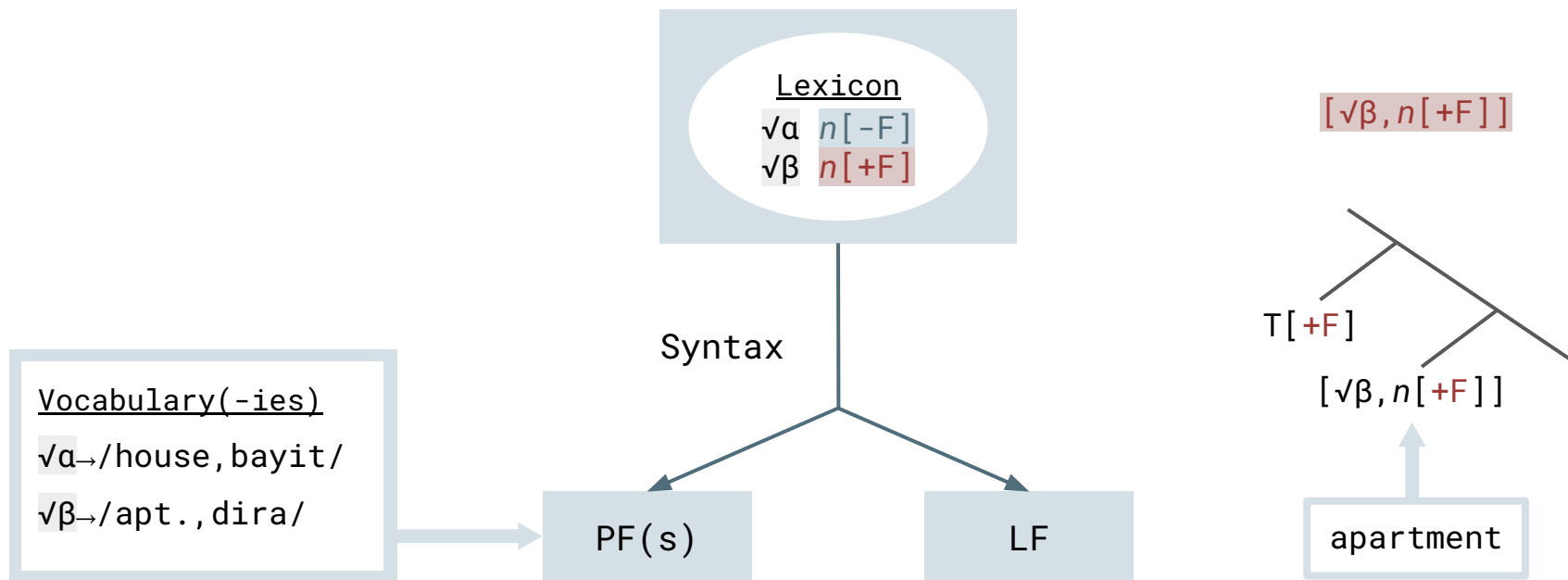
Against optionality

- (i) The **preference** for analogical agreement is unpredicted by optionality.
- (ii) The contrast between **dependency types** is incompatible with optionality.
- (iii) The rates of default agreement are consistent with a **performance error**.
 - ↪ Gollan and Frost (2001): Monolingual Hebrew speakers miscategorize irregularly marked feminine nouns as masculine in **37.6%** of the trials.
 - ↪ The rate of default agreement in our studies was **~36%**.

Grammatical analogical agreement



Grammatical analogical agreement



“Default” agreement as a performance error

- ↪ The performance of agreement relies on retrieval of gender information via lexical or morphological information.
(Sá-Leite & Lago 2024)
- ↪ **English exponents do not carry Hebrew gender morphology.** This may interfere with the performance of gender agreement, resulting in masculine agreement (unmarked).
- ↪ This proposal likens “default” agreement in ICS to monolingual agreement with irregular nouns, which is similarly error prone.

Dependency type effect

- ↪ We find **more** default masculine agreement in adjectival concord compared to pronoun form selection (cf. Valenzuela et al. 2012).
- ↪ We attribute this to the likelihood of morphology-based interference given different *routes* to gender information:
 - ↪ **Concord** relies on a structurally determined local antecedent.
 - ↪ **Pronouns' phi-features** are determined via retrieval of the discourse referent's gender specification.

? The Agreement Hierarchy (Corbett 1979)

attributive > predicative > relative pronoun > personal pronoun

Conclusions

Analogical agreement is prevalent and preferred



Gender marked abstract lexical items under DM

Representation

Some default agreement, especially in concord



Interference of the English exponent's genderlessness

Performance

Thank you!

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P.I.s Aya Meltzer-Asscher & Julia Horvath

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Two gendered languages

(1) eta knyga *mamaš arox* | *aruka*
this book.F really long.M | long.F

книга

ספר

(2) eto yaytso *mamaš ta'im* | *te'ima*
this egg.N really tasty.M | tasty.F

яйцо

ביצה

Results: Experiment 2

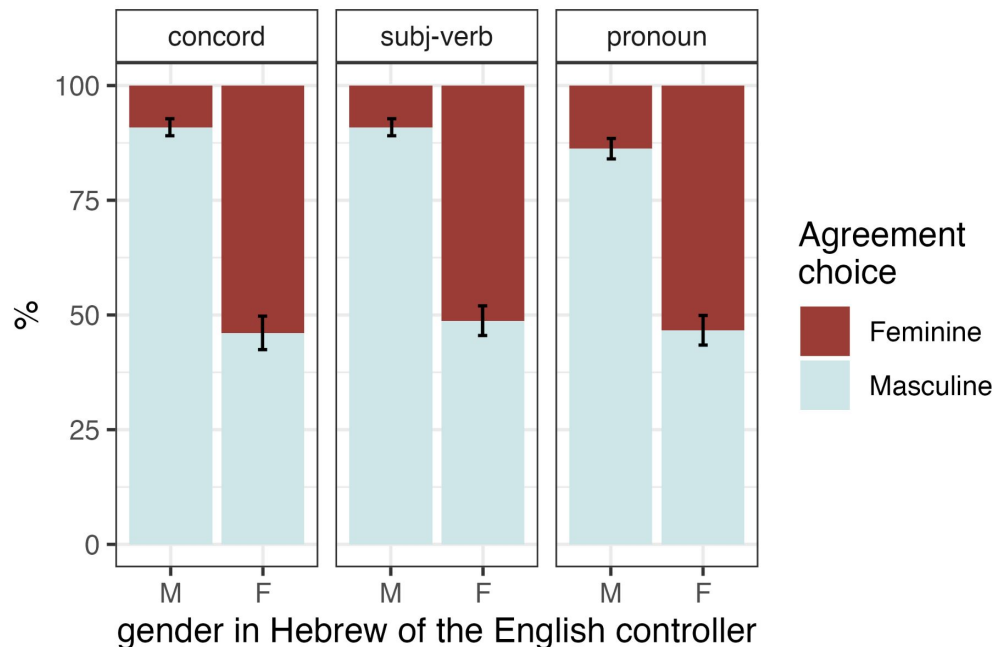
Analogical agreement

Participants tended to choose Hebrew-matching agreement.

Default masculine

Participants chose less Hebrew-matching agreement with *feminine*- compared to *masculine-in-Hebrew* nouns

Est.	Est. Error	95% CrI lower	95% CrI upper
-1.27	0.22	-1.72	-0.85

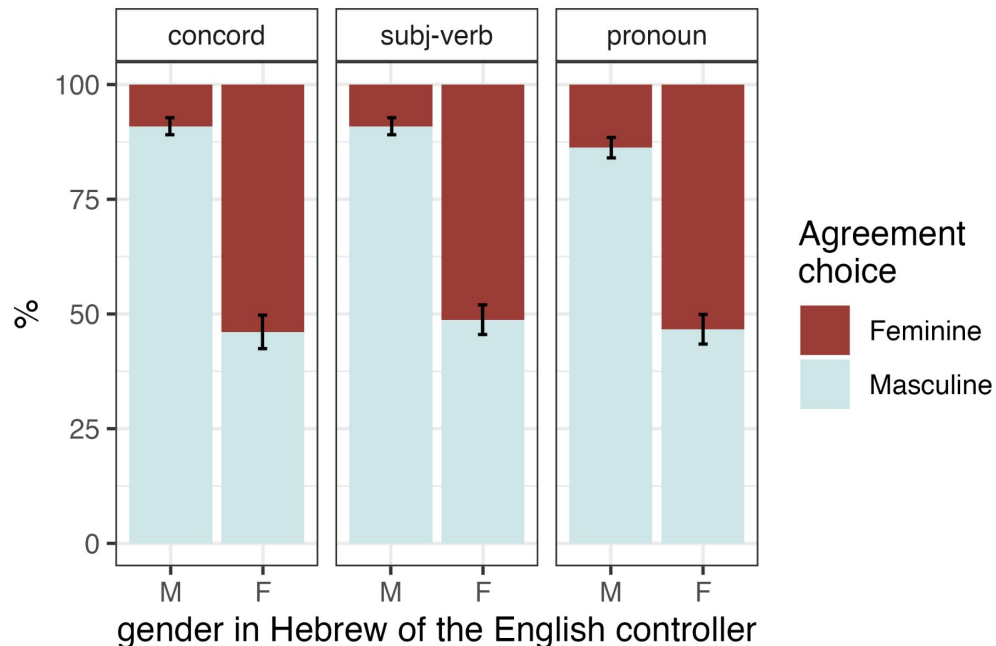


Results: Experiment 2

Dependency type

There is some evidence that the contrast between *feminine-* and *masculine-in-Hebrew* nouns was **larger** in the *concord* and *subj-verb* compared to the *pronoun* condition.

Est.	Est. Error	95% CrI lower	95% CrI upper
0.09	0.08	-0.08	0.25



Results: Experiment 3

