Psycholinguistic verification of the Person Case Constraint in Slovenian

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PsychoSlav

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Outline

Second-position clitics

Slovenian, like other Slavic languages, has *second-position clitics*:

(1) Mama **mi** **ga** **bo** predstavila.
mom me.DAT him.ACC FUT.3SG introduce
'Mom will introduce him to me.' (Stegovec, 2020, p. 264)

This shows the standard order: datives precede accusatives (cf. Franks & King, 2000, p. 45)

The Person-Case Constraint

This ordering (DAT–ACC) interacts with a restriction (which has been found, in various forms, across many languages) on clitic combinations like *mu me*:

(2) *Mama **mu** **me** **bo** predstavila.
mom him.DAT me.ACC FUT.3SG introduce
'Mom will introduce me to him.' (Stegovec, 2020, p. 264)

Stegovec (2020) decomposes this into:

- person: 1–3 (inviolable)
- case: DAT–ACC (violable in certain discourse conditions or to satisfy person order)

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The Person-Case Constraint

What is the source of this ordering constraint? Proposals include:

- formal properties of syntactic agreement (e.g. Adger & Harbour, 2007; Anagnostopoulou, 2003; Béjar & Rezac, 2003; Coon & Keine, 2021; Deal, 2024; Nevins, 2007; Stegovec, 2020)
- grammaticalized biases in semantic pairing of person and role (Haspelmath, 2004)

Summary

Two self-paced reading experiments testing the pattern in Slovenian – the first psycholinguistic study of the PCC (as far as we know).

- Can we find processing effects of the PCC alongside acceptability judgements?
- Can we localize the PCC effect specifically in *grammaticality* (as opposed to semantic expectations/frequency)?
- Is the "PCC repair" clitic order (*me mu*) degraded relative to the "canonical" order (*mi ga*)?

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- Can we find processing effects of the PCC alongside acceptability judgements?
- Can we localize the PCC effect specifically in *grammaticality* (as opposed to semantic expectations/frequency)?
- Is the "PCC repair" clitic order (*me mu*) degraded relative to the "canonical" order (*mi ga*)?

The answer to all these questions is **yes**!

Outline

Design

Context: Moja babica pravi, da se je zaljubila v spretnega mizarja.
'My grandmother says that she fell in love with a skilled joiner.'

Target: V nedeljo **mi** **ga** bo razkrila.
on Sunday me.DAT him.ACC FUT.3SG reveal
'On Sunday she will reveal him to me.'

Comprehension: Which of these matches the above sentence in meaning?

Babica bo razkrila svojemu vnuku novega partnerja.
'The grandmother will reveal her new partner to her grandson.'

Babica bo razkrila novemu partnerju svojega vnuka.
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Measuring:

- Self-paced reading: (inverse) RT on last word of sentence
- Comprehension: accuracy

Design

Context: Naš šef je rekel, da tudi jaz potrebujem svojo tajnico.
'Our boss said that I also need a secretary.'

Target: V ponedeljek **ji** **me** bo poslal.
on Monday her.DAT me.ACC FUT.3SG send
'On Sunday he will send me to her.'

Comprehension: Which of these matches the above sentence in meaning?

Šef bo poslal svoji podrejeni novo tajnico.
'The boss will send the new secretary to his subordinate.'

Šef bo poslal novi tajnici svojo podrejeno.
'The boss will send his subordinate to the new secretary.

Measuring:

- Self-paced reading: (inverse) RT on last word of sentence
- Comprehension: accuracy

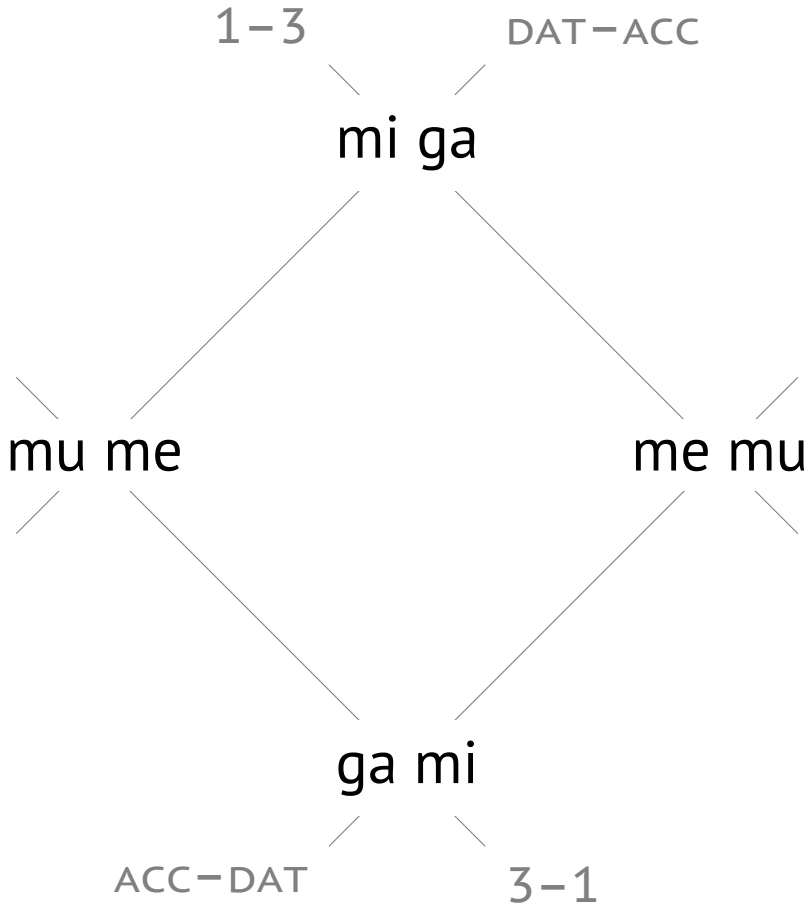
Expected effects

Reported grammaticality effects (expected especially in self-paced reading):

- 1–3 and DAT–ACC (PCC without repair)
- 1–3 only (PCC with repair)

Reported frequency effect (expected in both self-paced reading and comprehension):

- 1=DAT, 3=ACC



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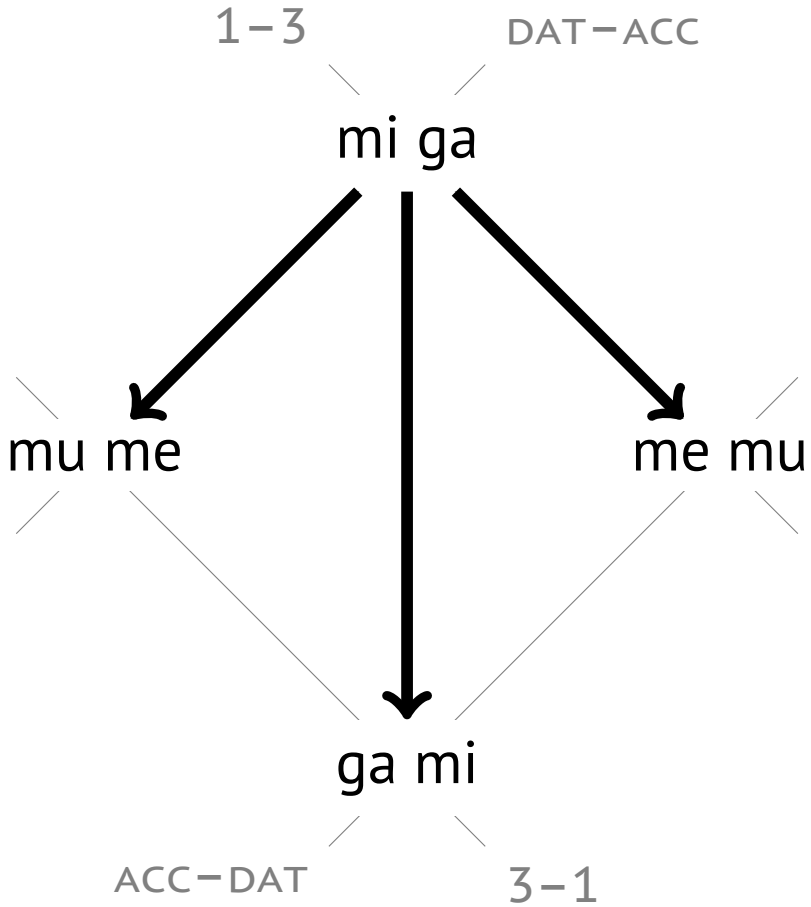

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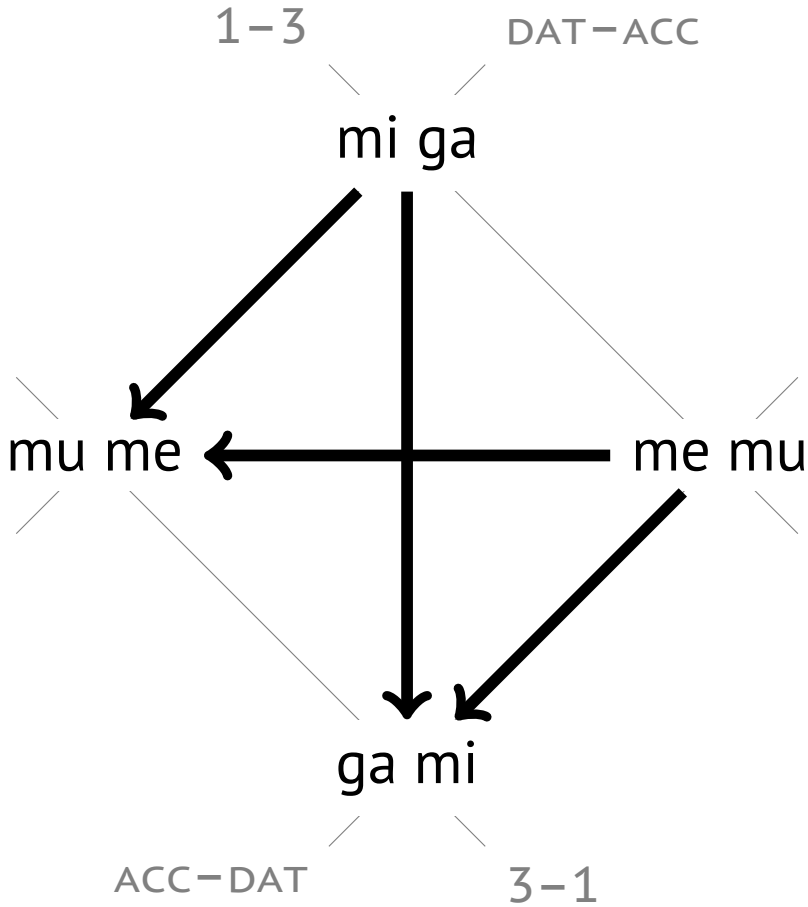

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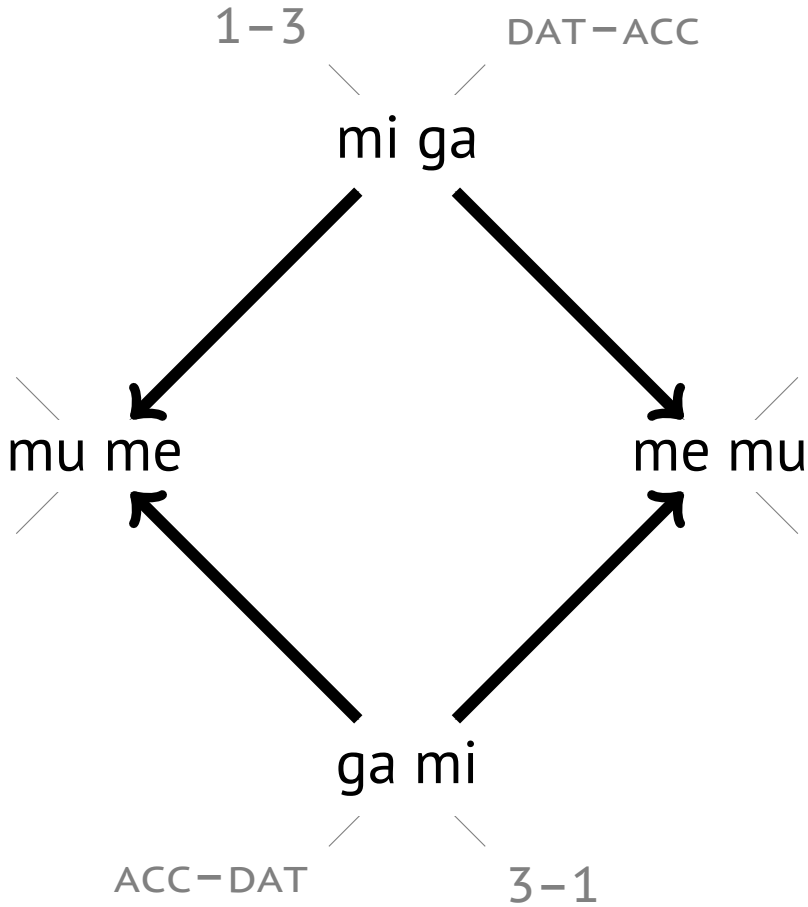
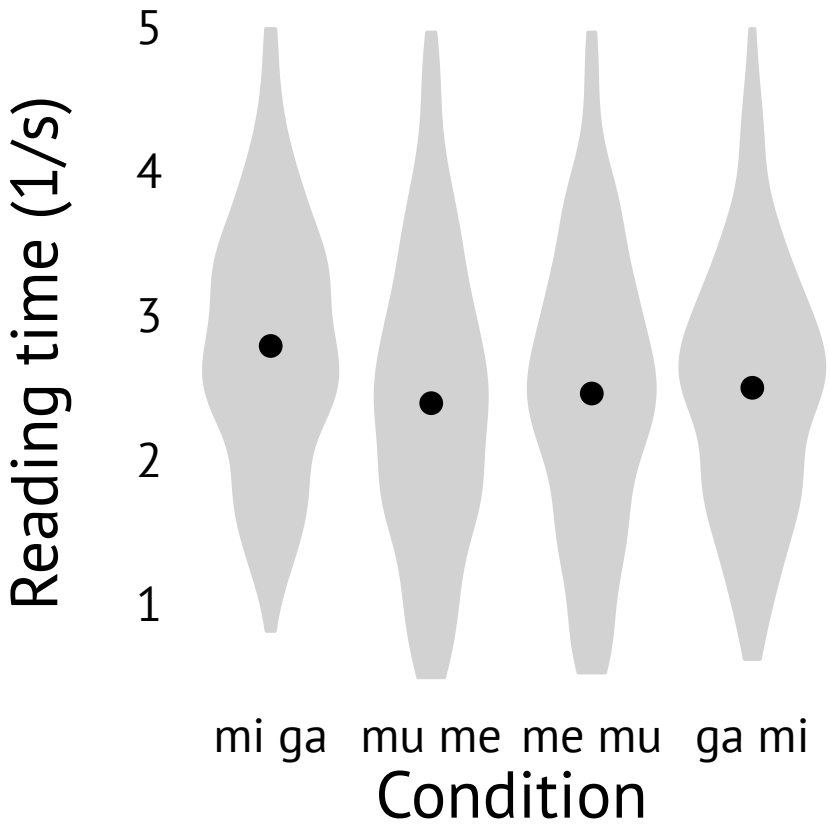


Trials

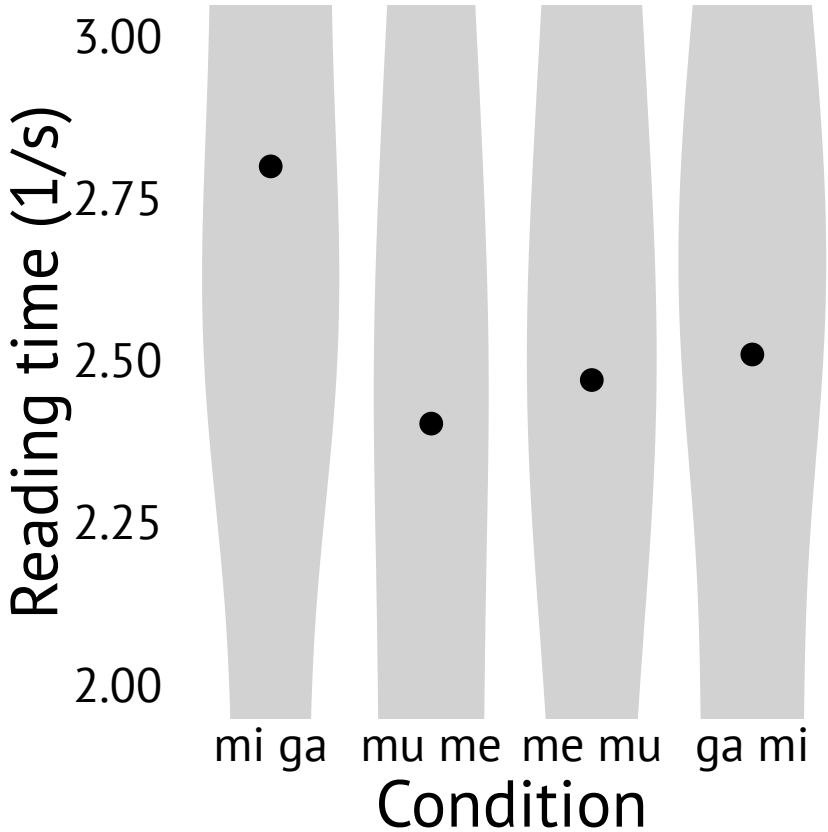
- 36 native Slovenian participants
- Each saw 40 target trials and 40 fillers
- Target comprehension questions had arguments of same gender
- Fillers had only one pronominal clitic, comprehension questions targeted its number or gender
- These participants had accuracy at least 60% on target comprehension questions and 85% on easier fillers
- RTs below 200 ms or above 2000 ms excluded (6.58% of trials)

Results: reading time



“Classic” PCC effect: one canonical order gets quicker RTs than all the rest

Results: reading time



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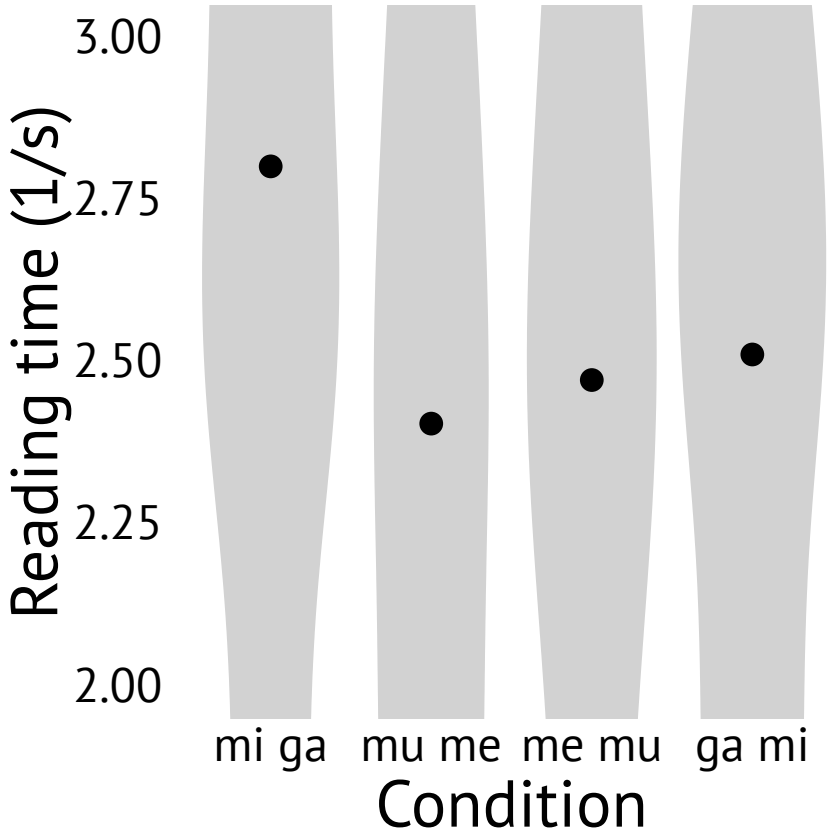

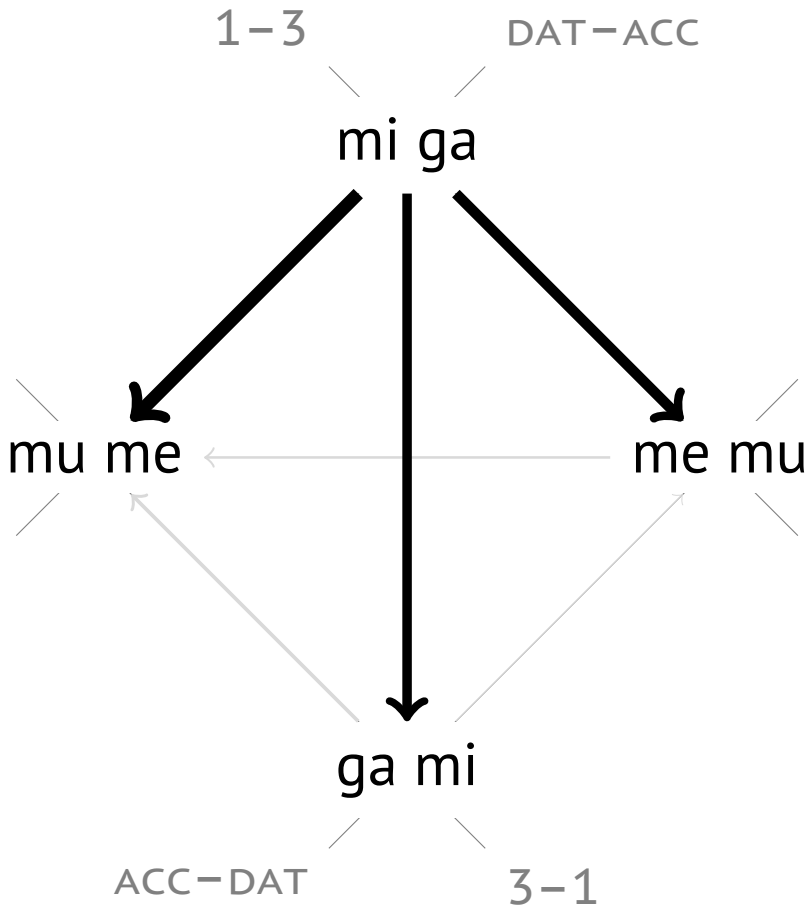

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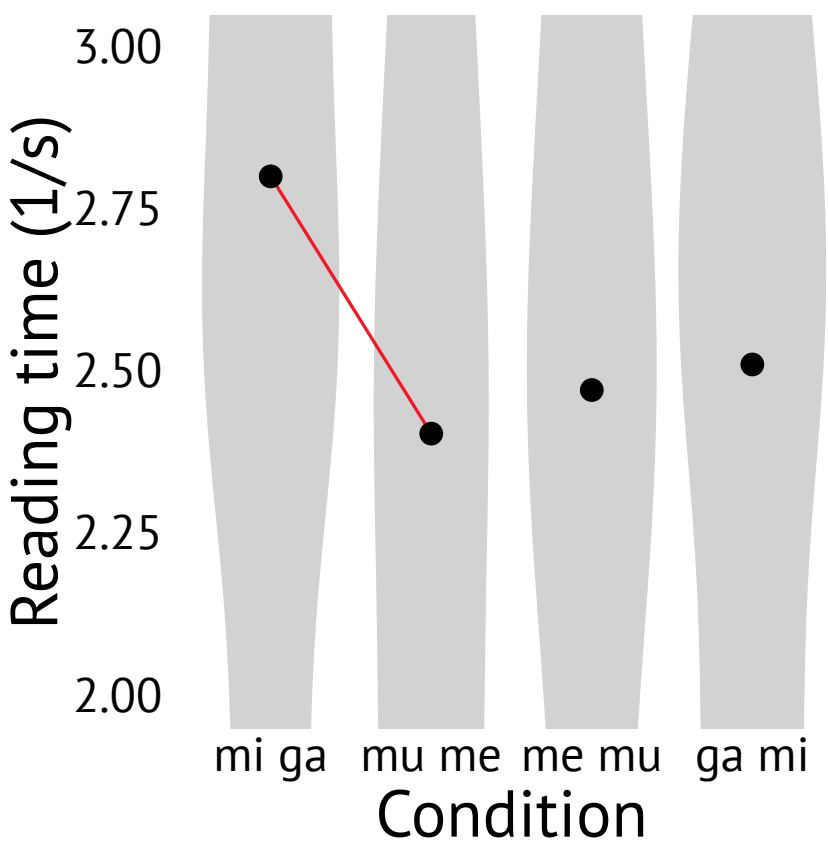

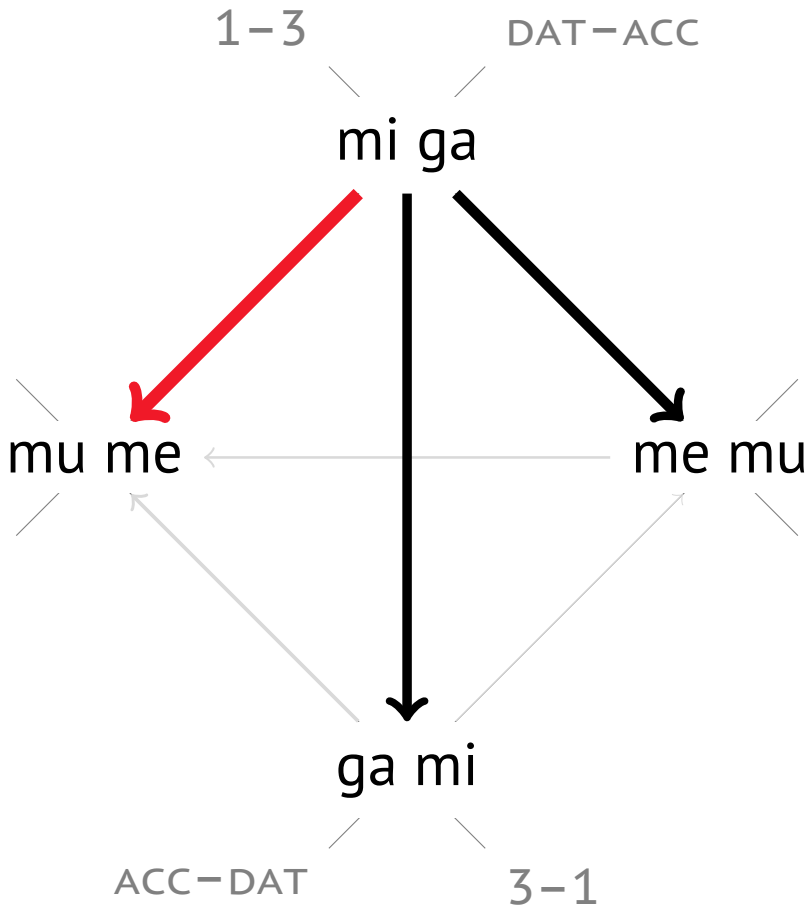

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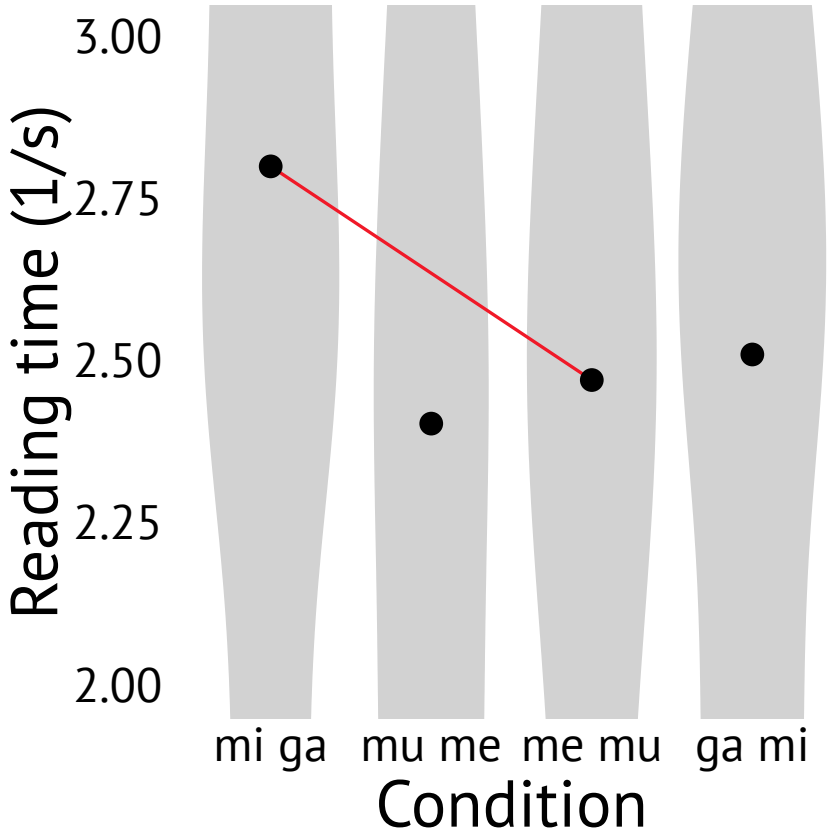

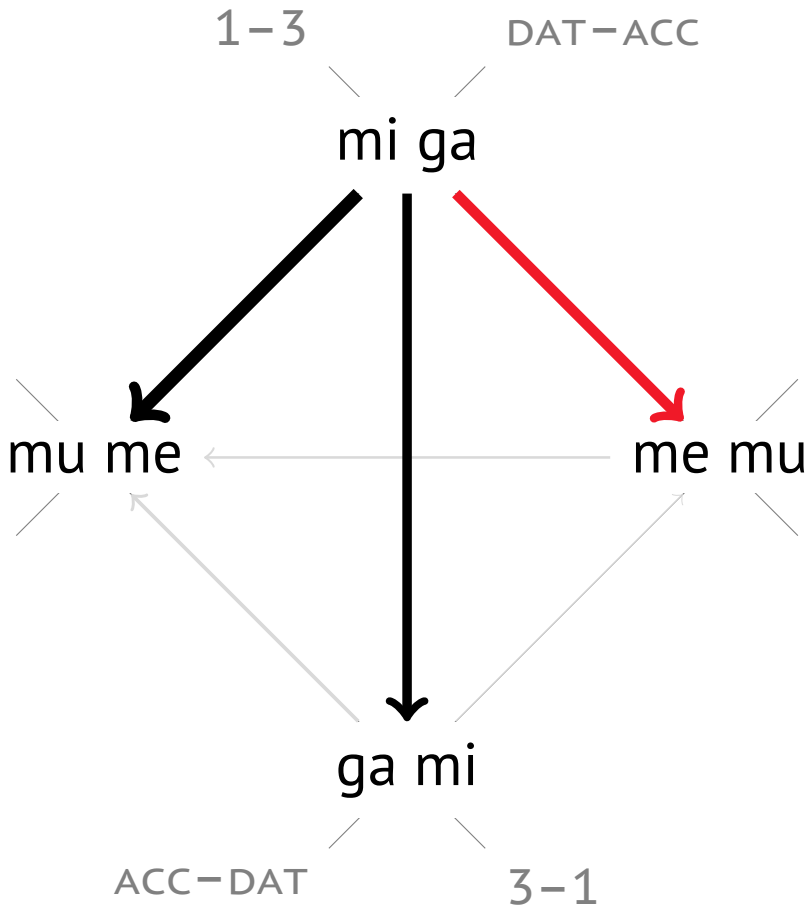

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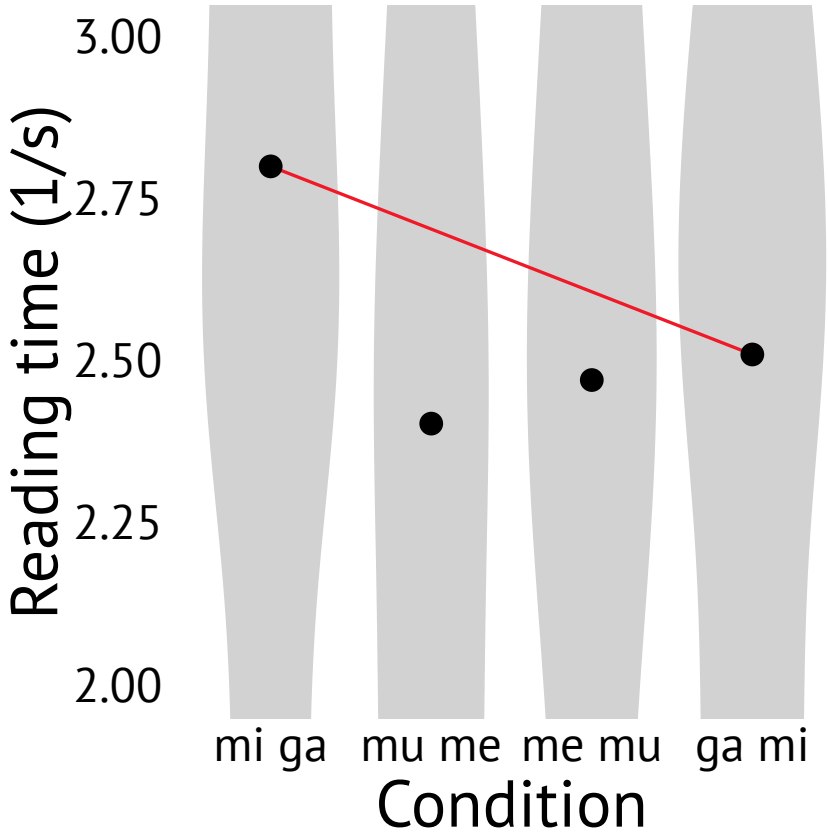

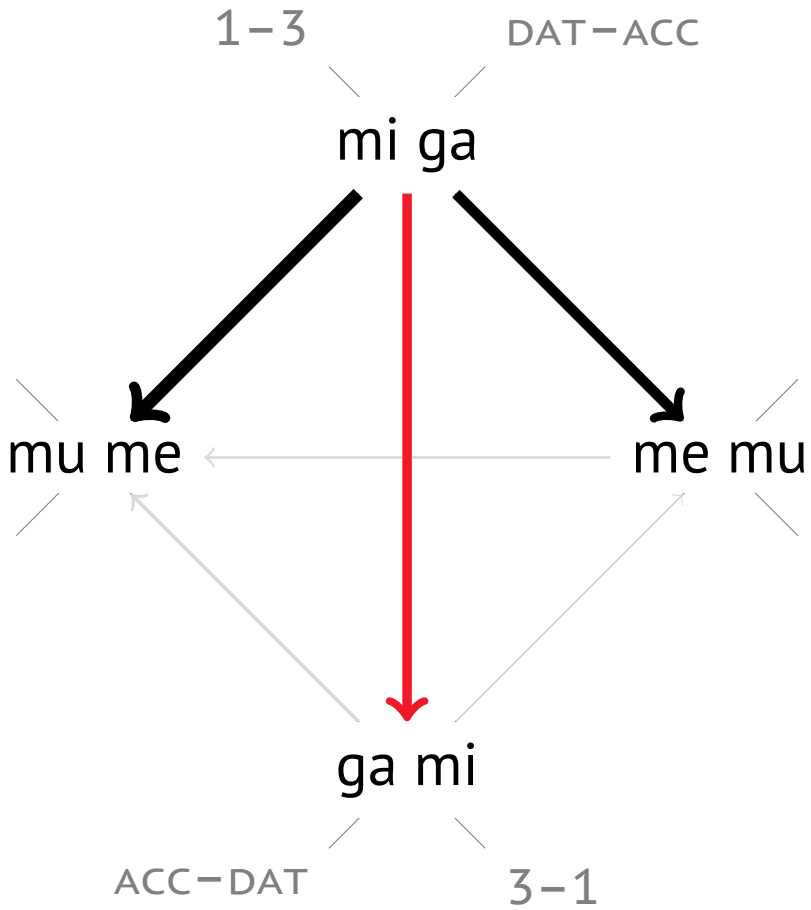

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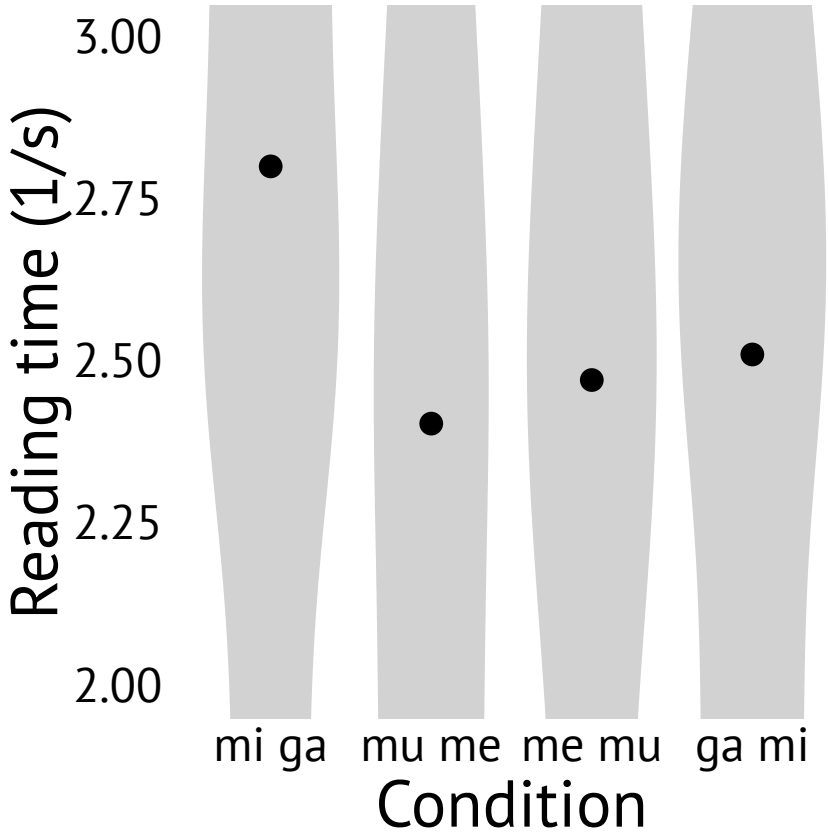

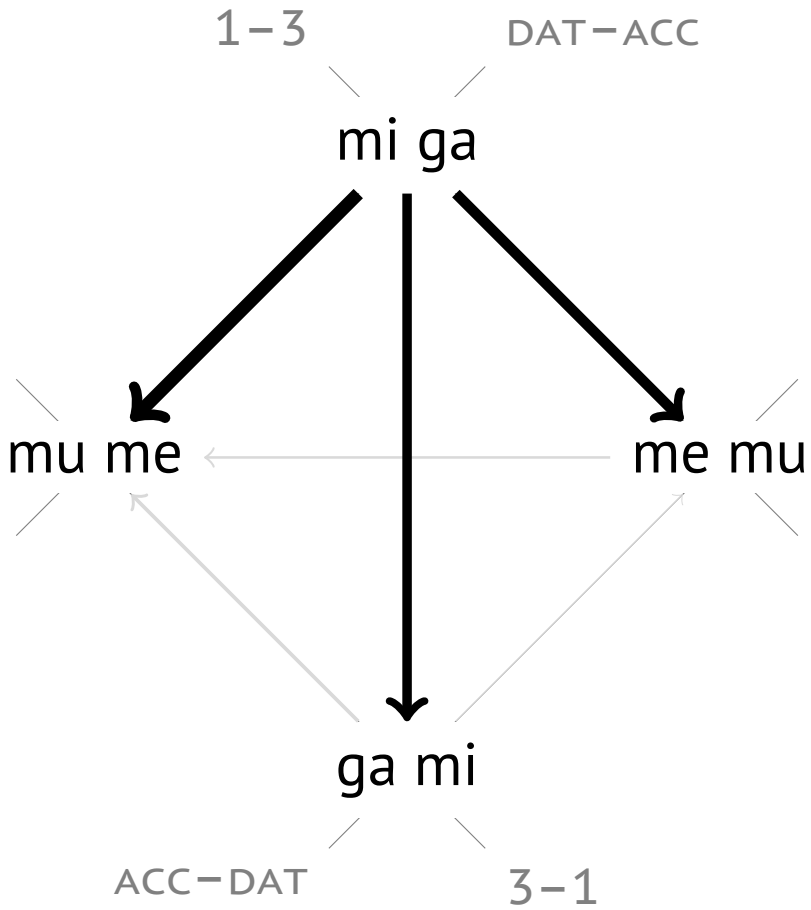

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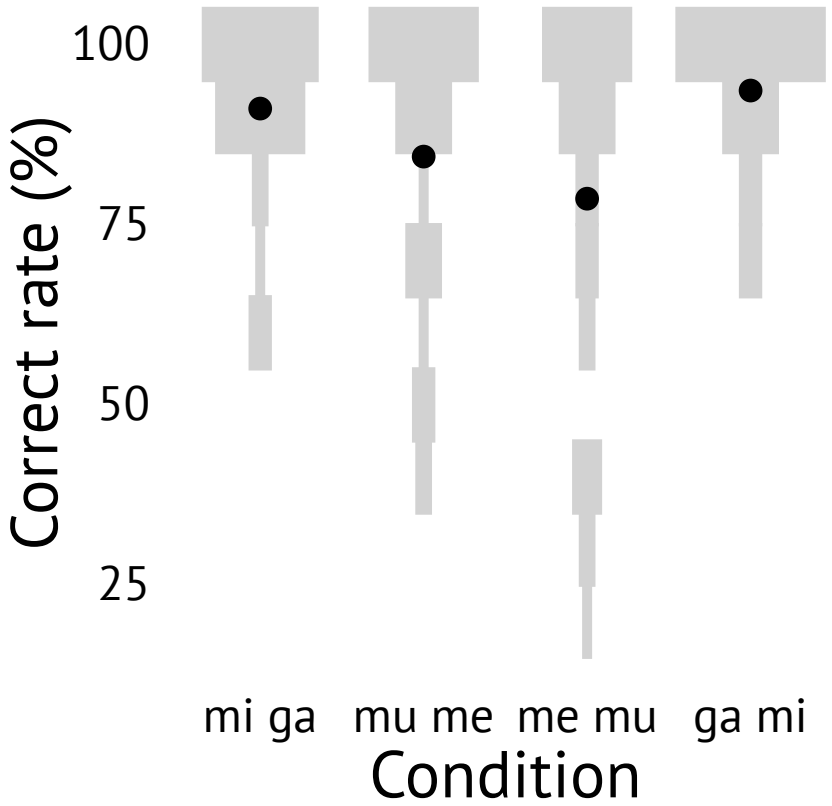
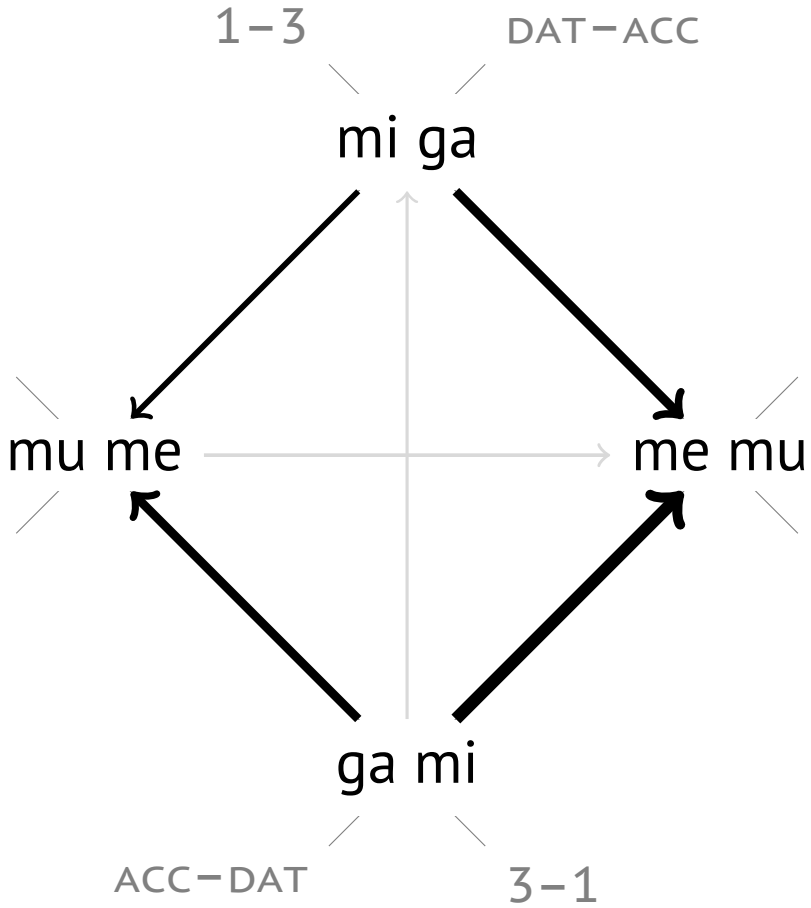
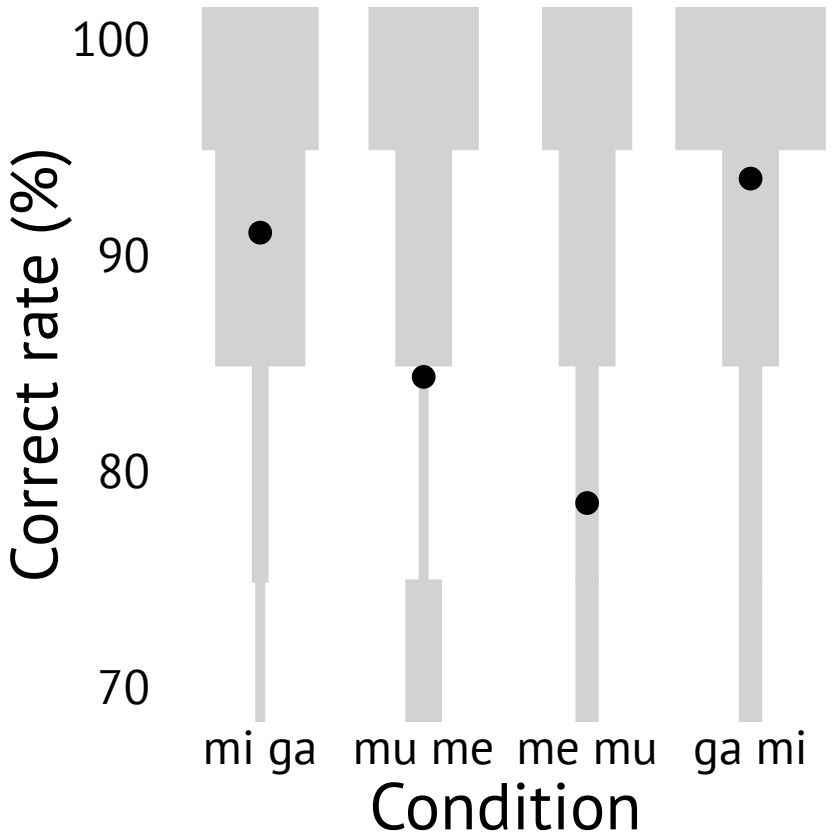
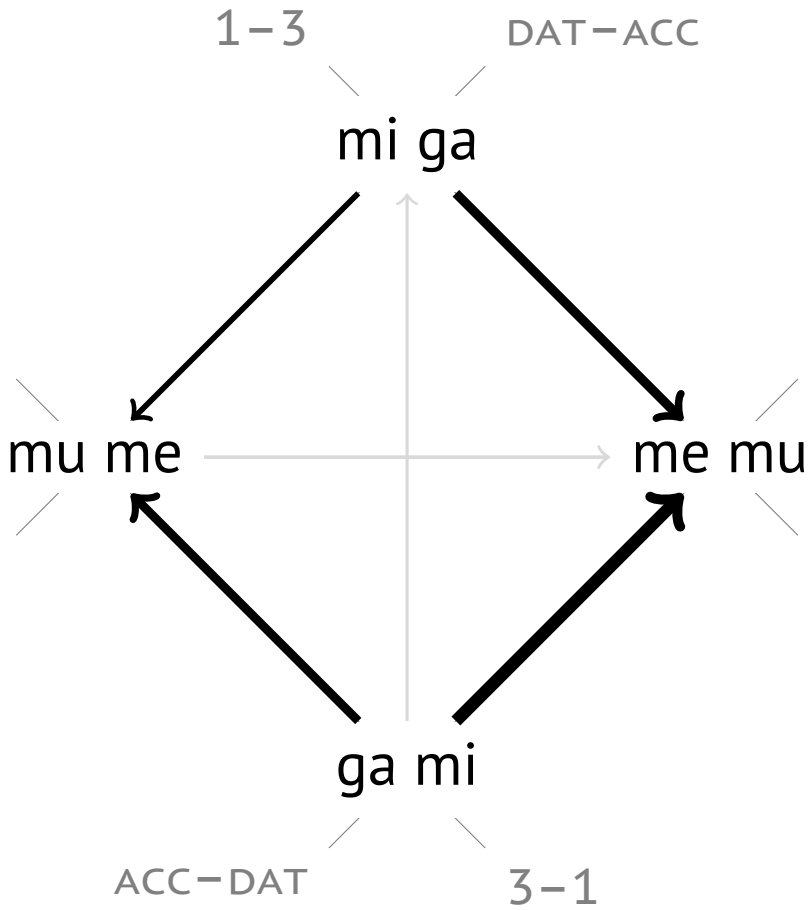




Semantic frequency effect: speakers biased towards the more common pairing of person and role

Results: comprehension accuracy





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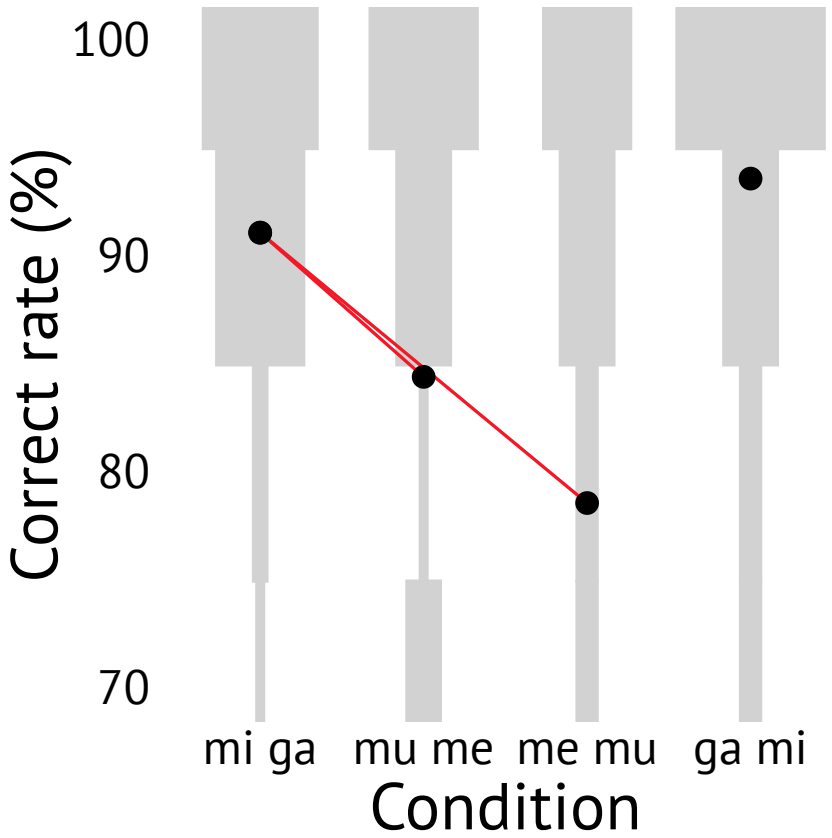

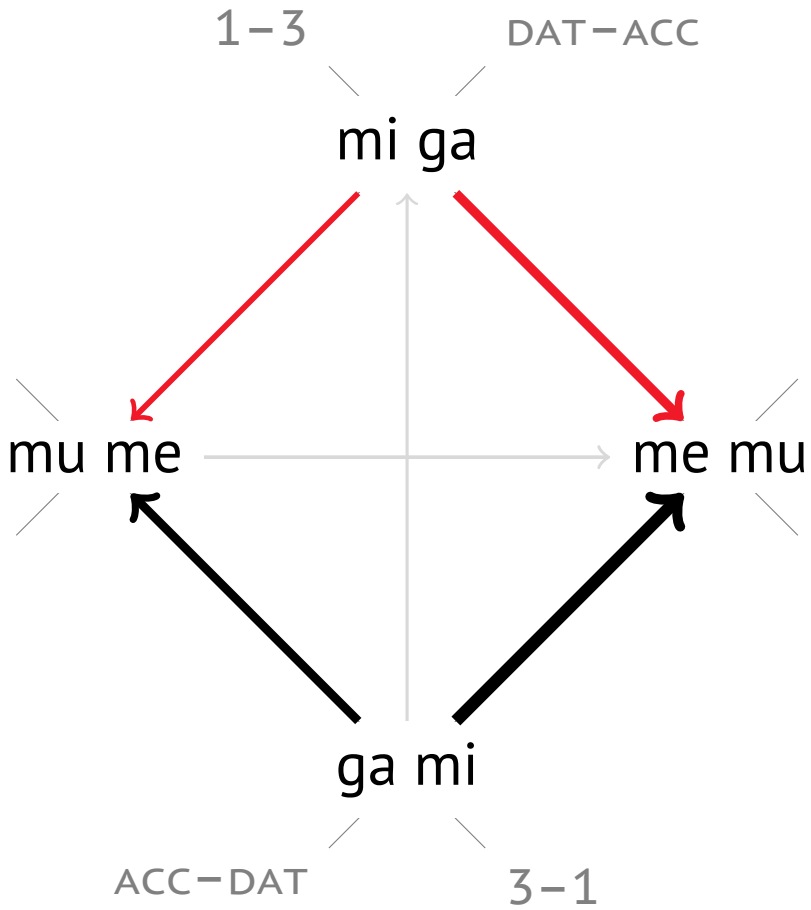

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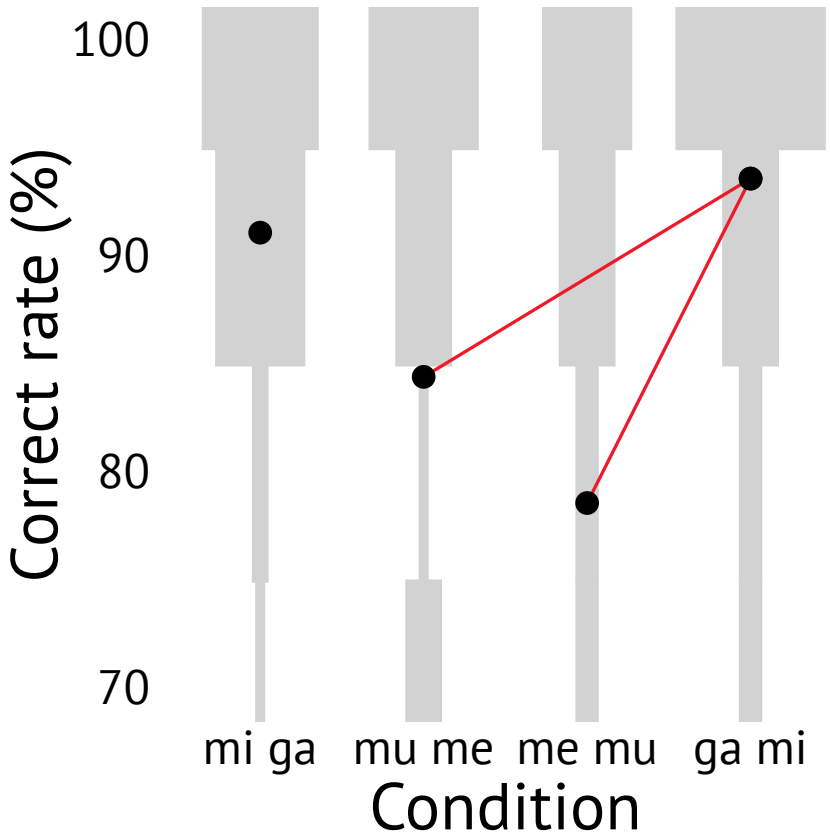

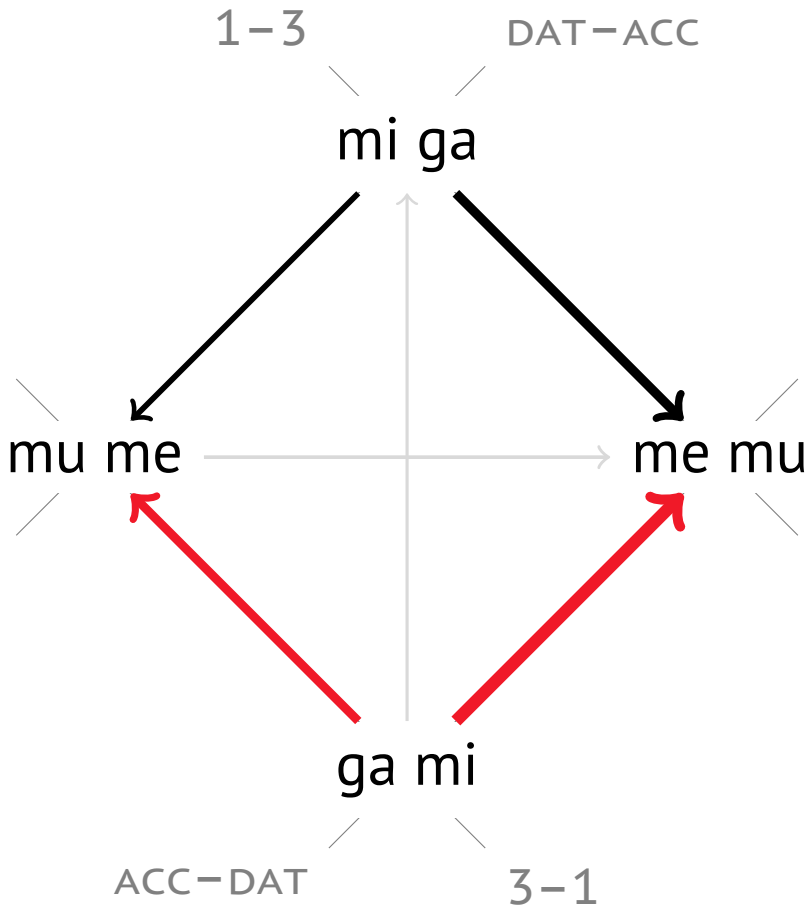

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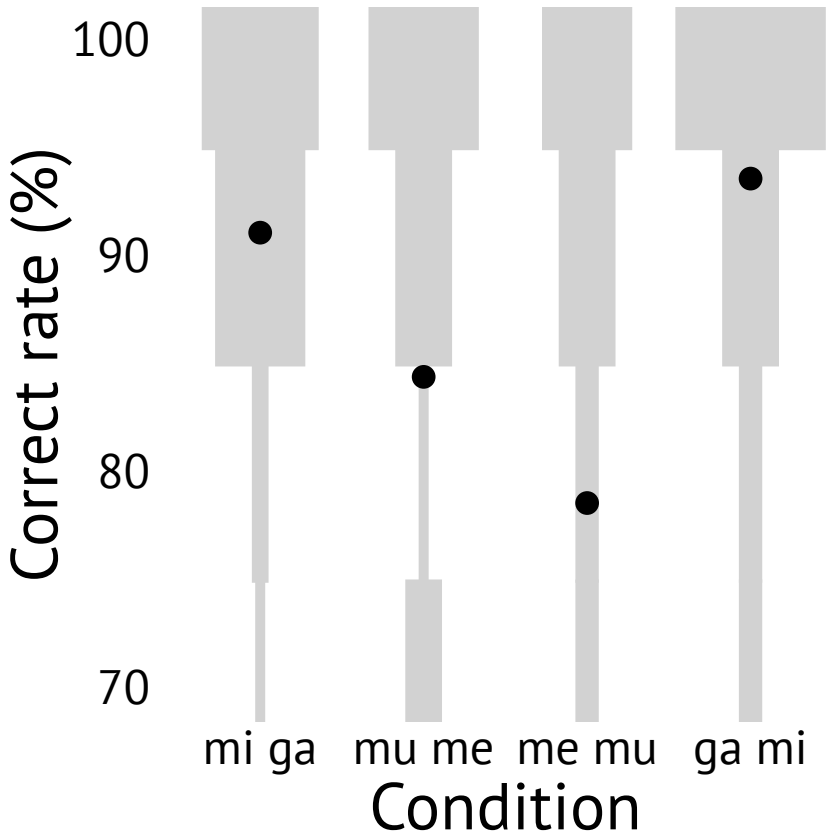

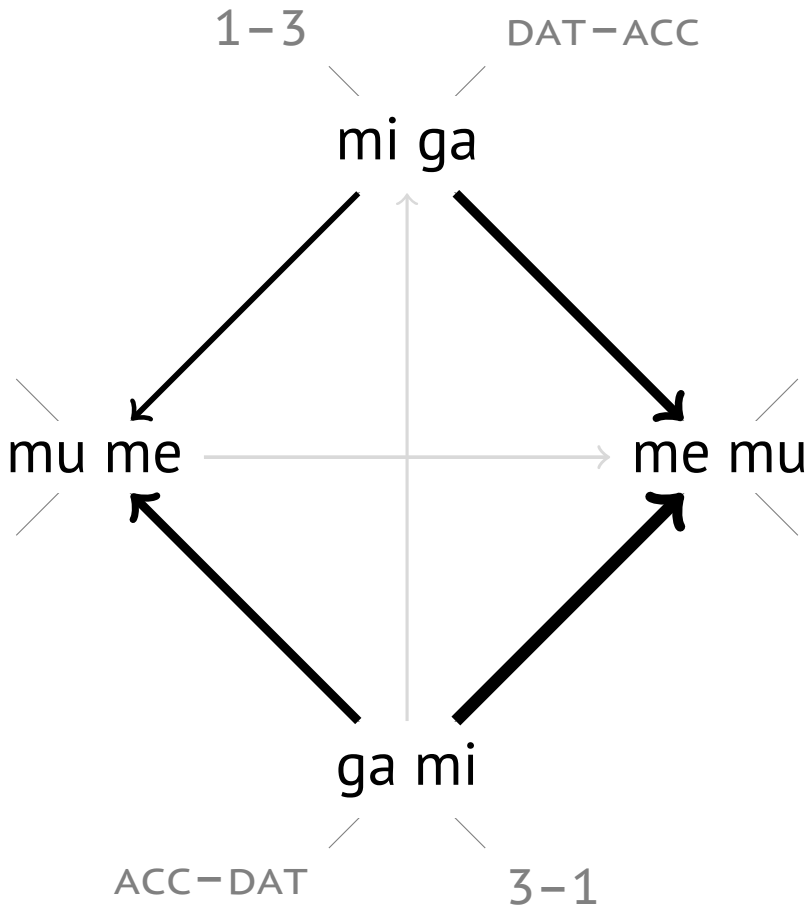

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Target: V nedeljo **mi** **ga** bo razkrila.
on Sunday me.DAT him.ACC FUT.3SG reveal
'On Sunday she will reveal him to me.'

Acceptability: Is the above sentence acceptable?

Measuring:

- Self-paced reading: (inverse) RT on last word of sentence
- Acceptability

Expected effects

Reported grammaticality effects (expected in both self-paced reading and acceptability):

- 1–3 and DAT–ACC (PCC without repair)
- 1–3 only (PCC with repair)

Reported frequency effect (expected in self-paced reading):

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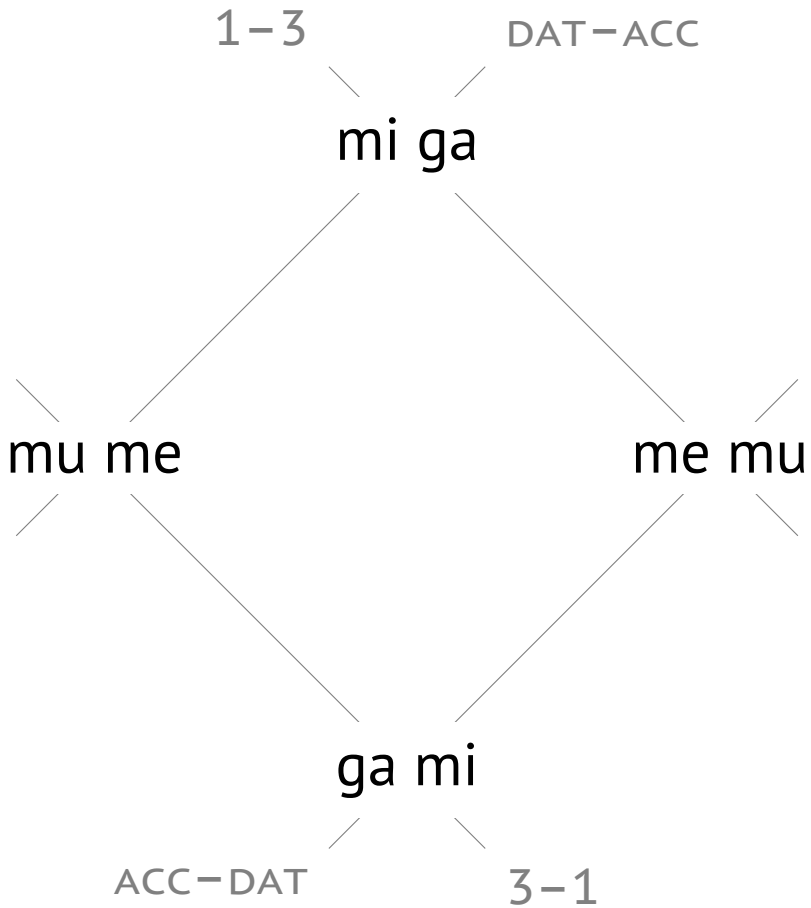

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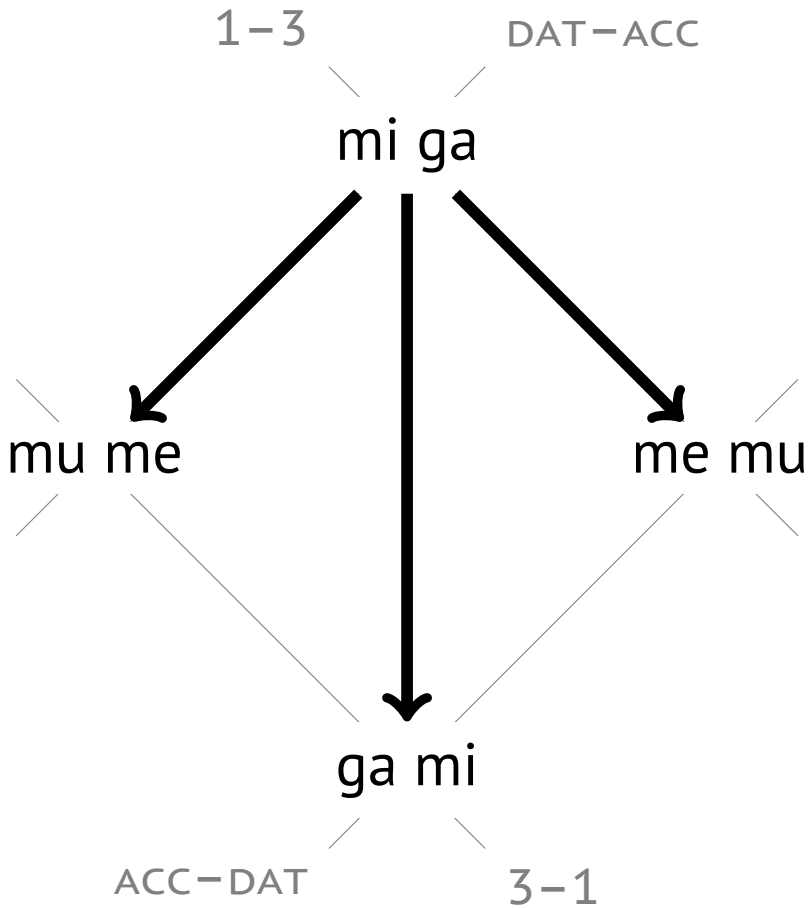

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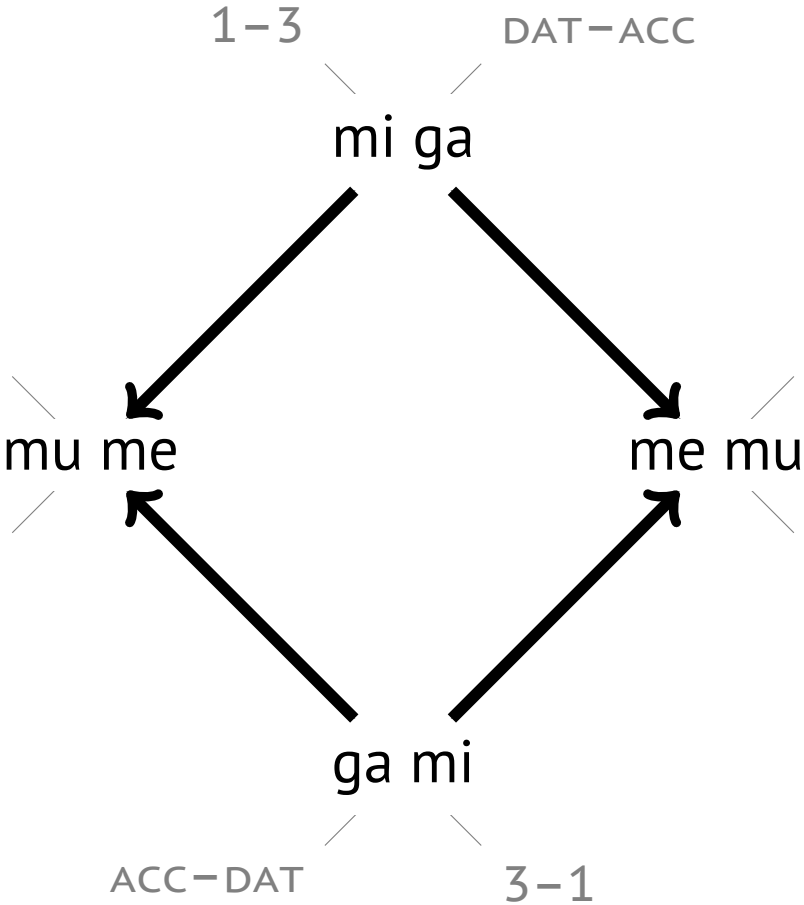
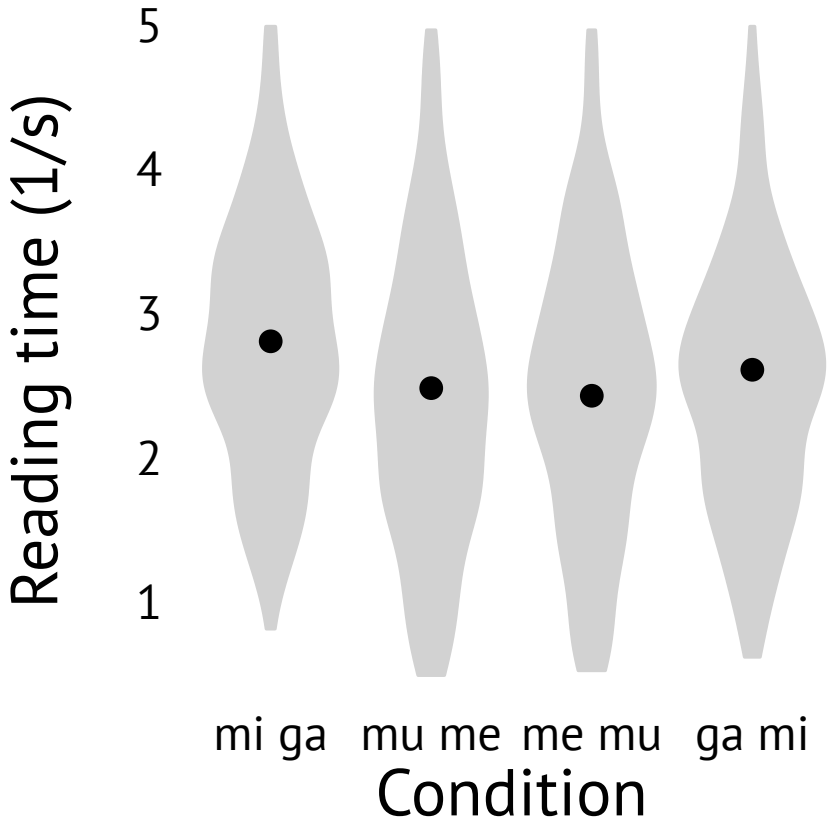
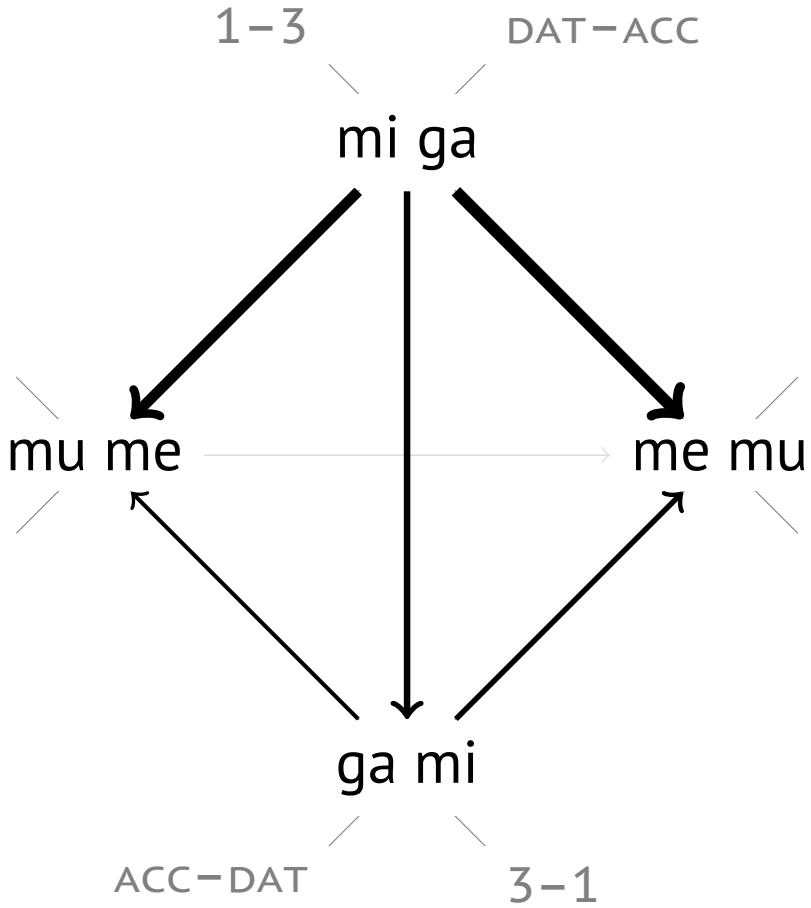


Trials

- 36 native Slovenian participants
- Each saw 40 target trials and 40 fillers
- 5 each had comprehension question instead of acceptability judgement (attention check)
- Fillers tested order of pronominal and auxiliary clitics (half grammatical)
- These participants had accuracy at least 60% on comprehension questions
- RTs below 200 ms or above 2000 ms excluded (3.19% of trials)

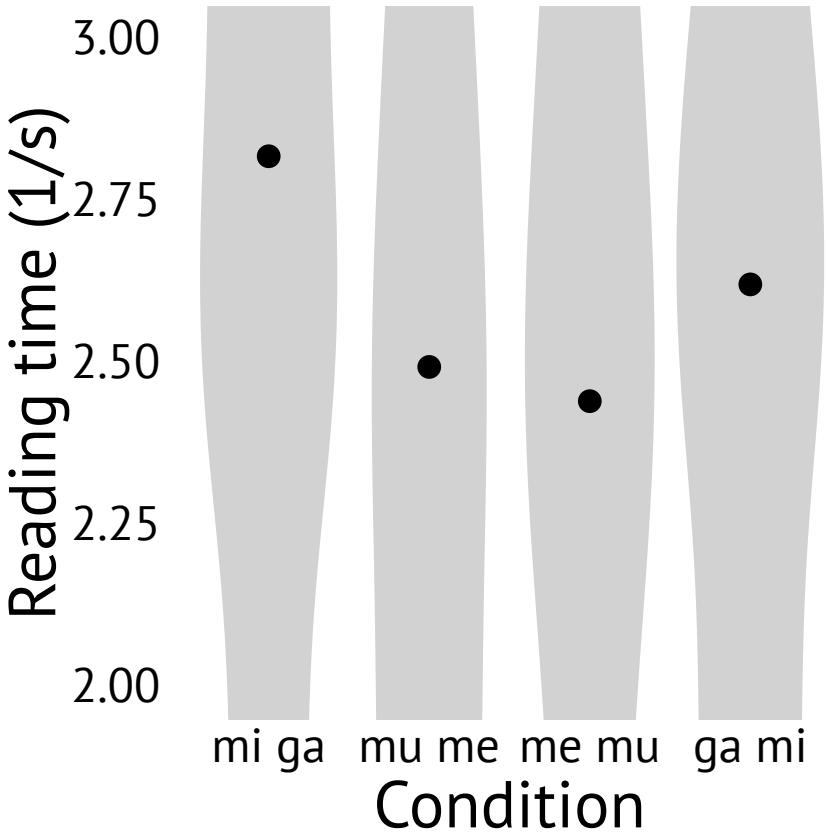
Results: reading time

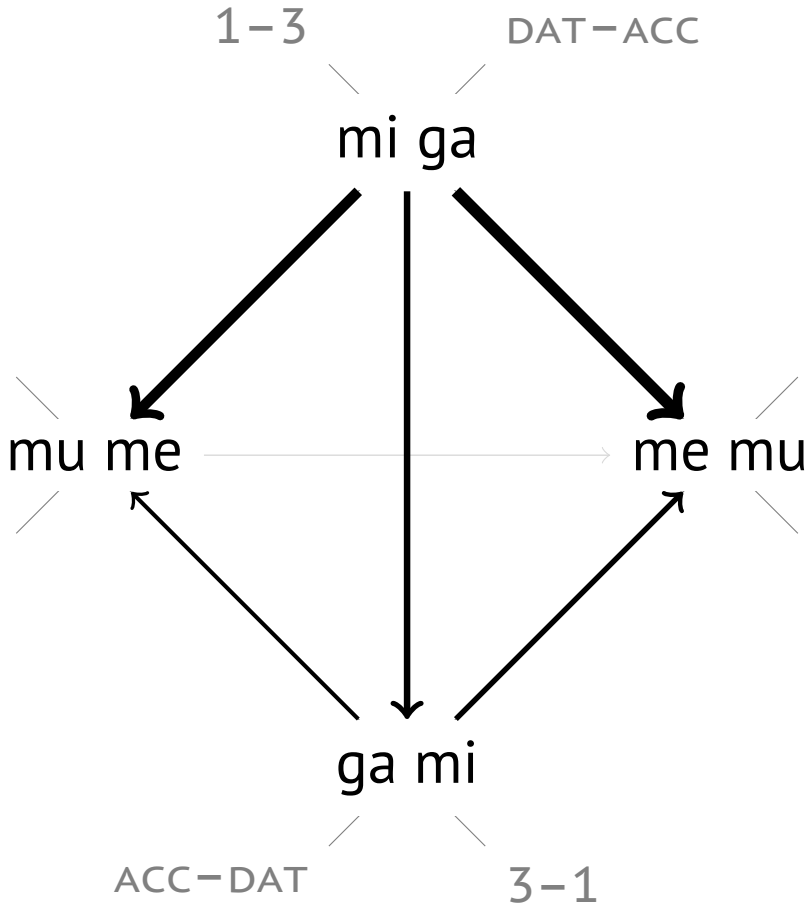




Combination of PCC effect (*mi ga* better than the rest) and semantic frequency effect (more common person–role pairing easier)

Results: reading time





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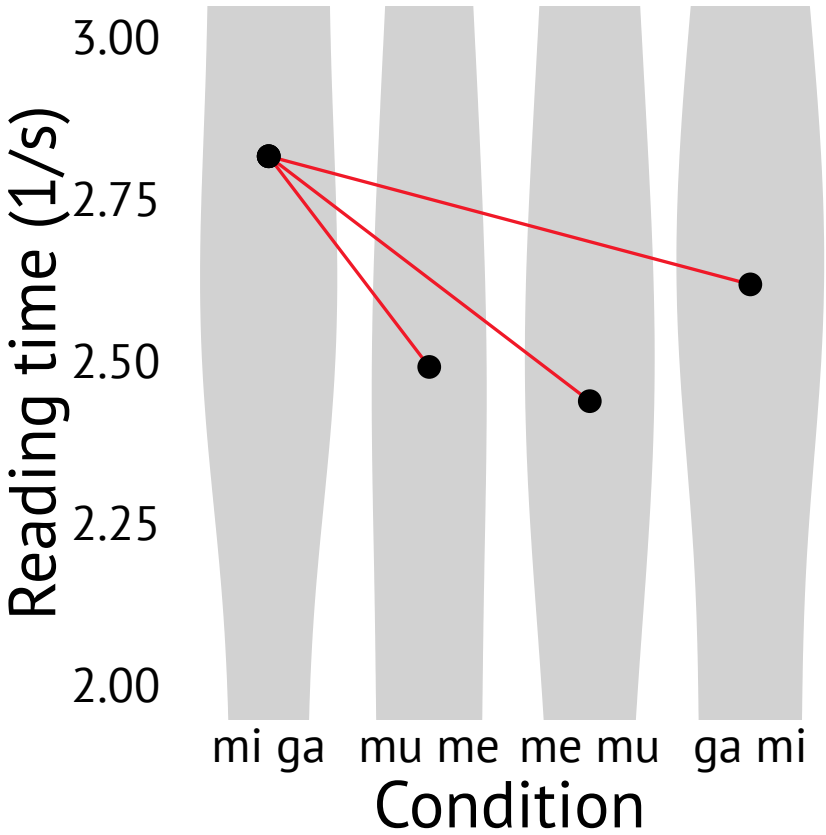
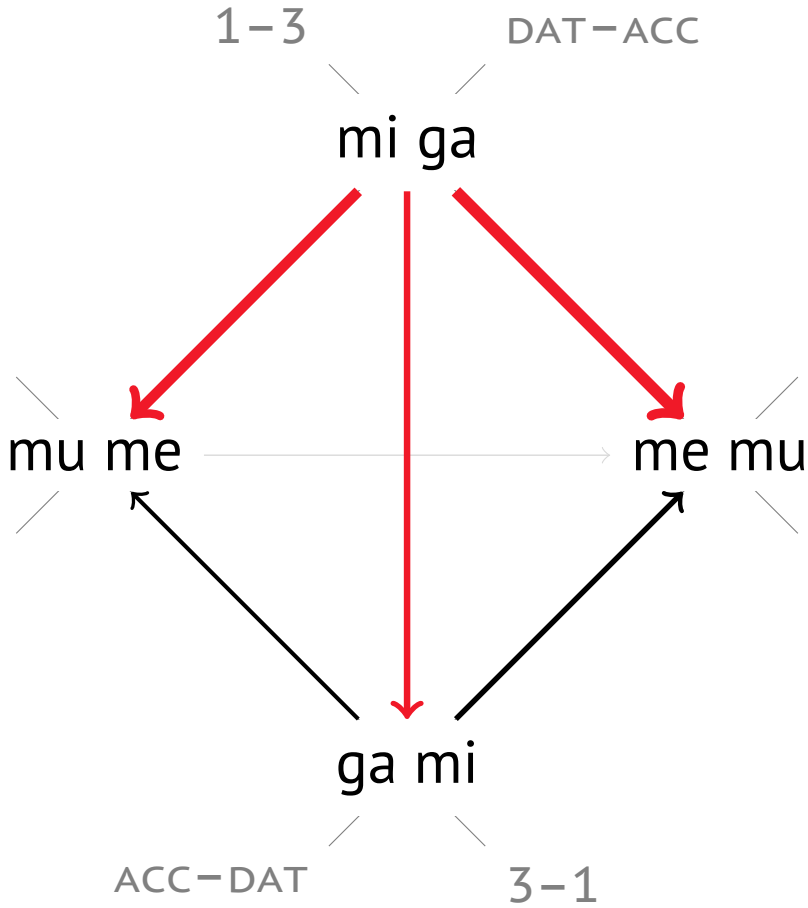
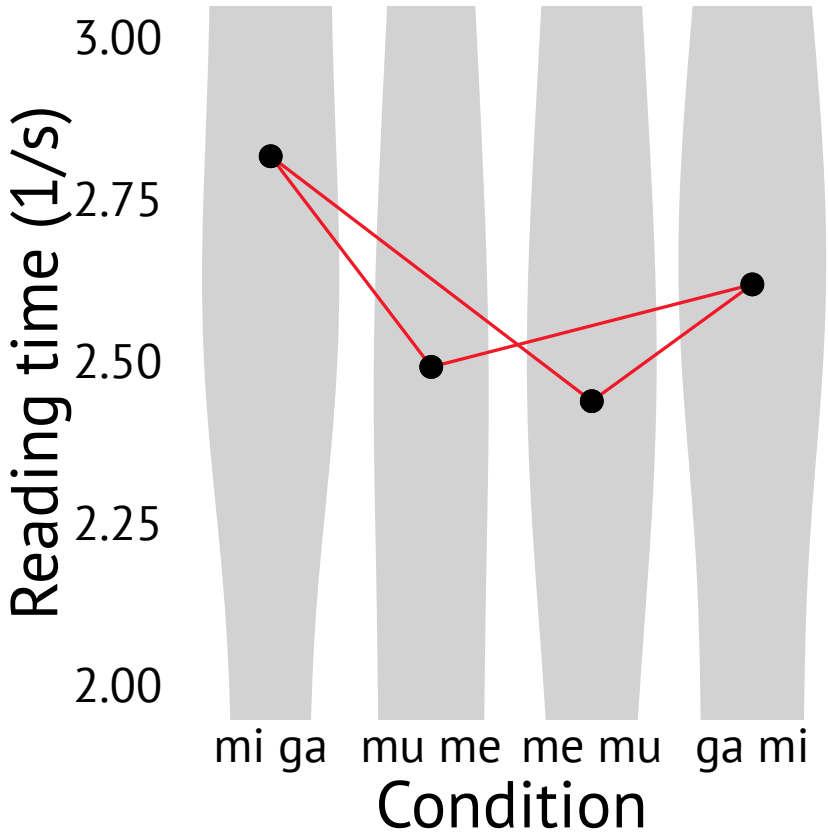
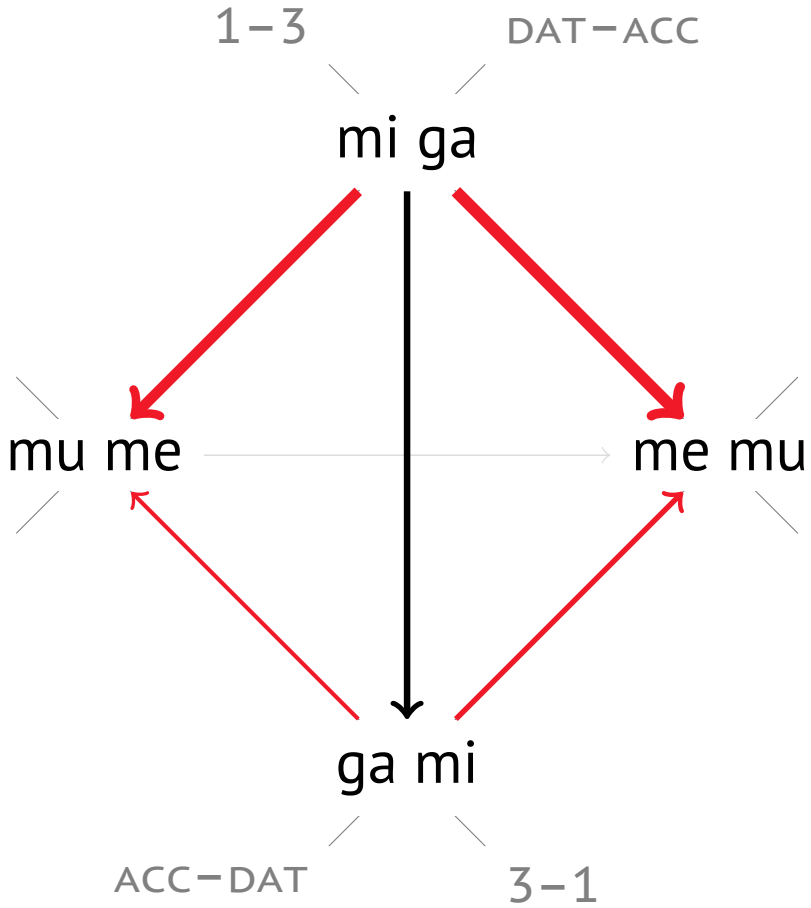




Combination of PCC effect (*mi ga* better than the rest) and semantic frequency effect (more common person–role pairing easier)

Results: reading time





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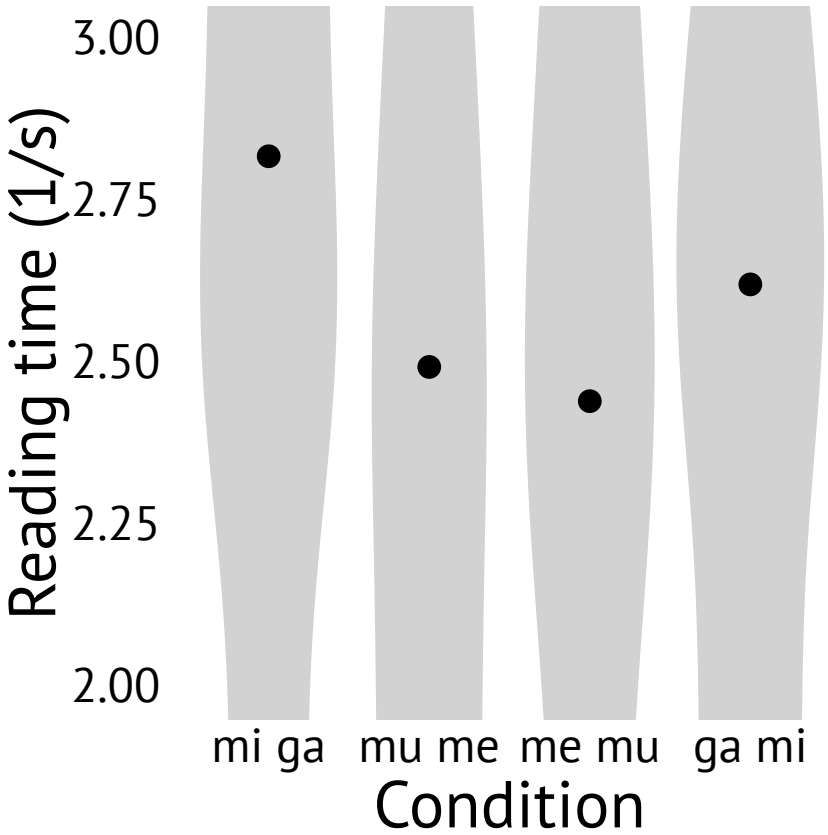

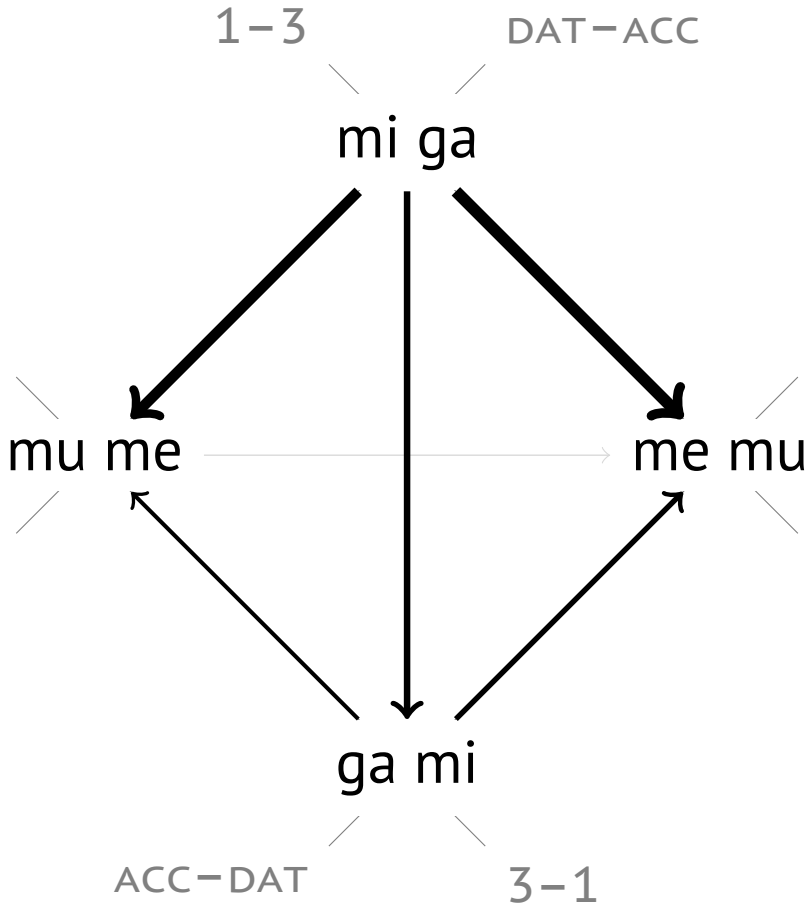

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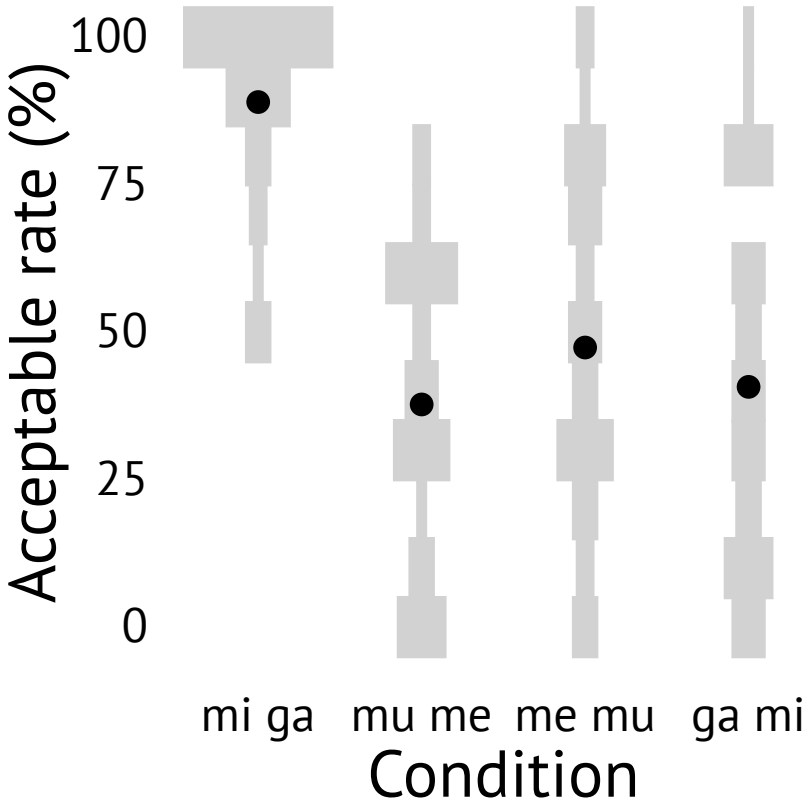
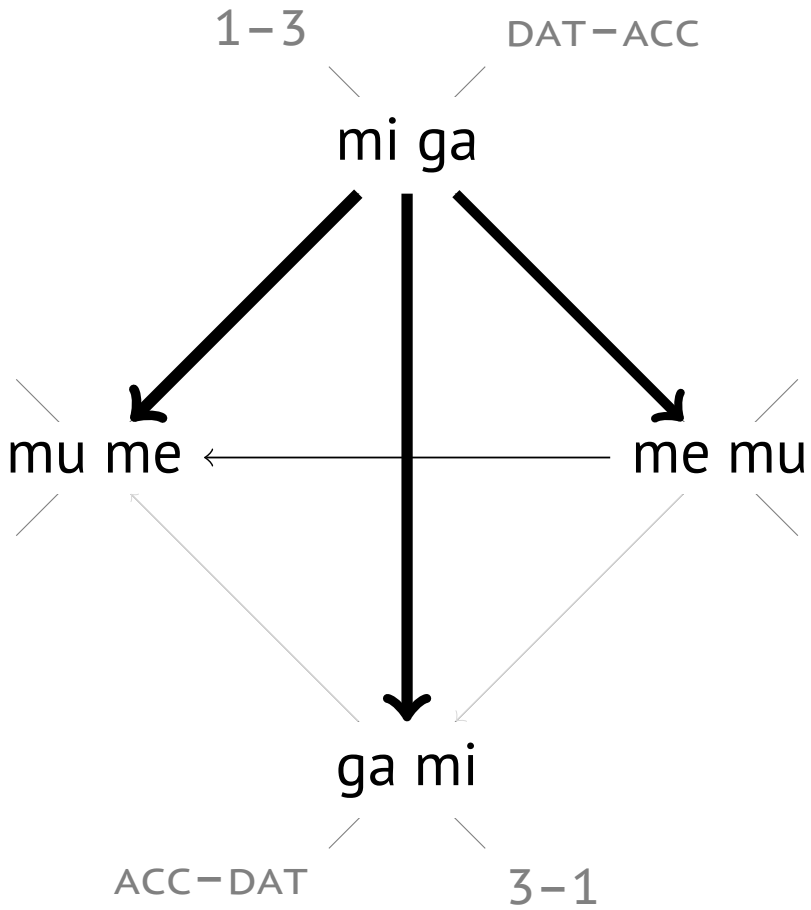
Results: acceptability





PCC effect: *mi ga* more acceptable than the rest, slight preference for person order to trump case order

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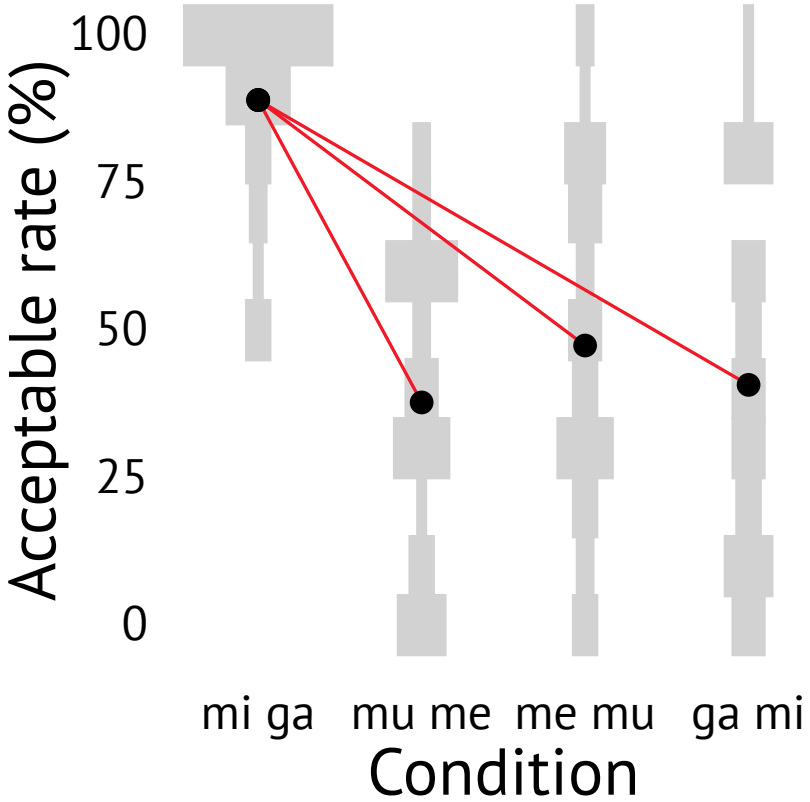

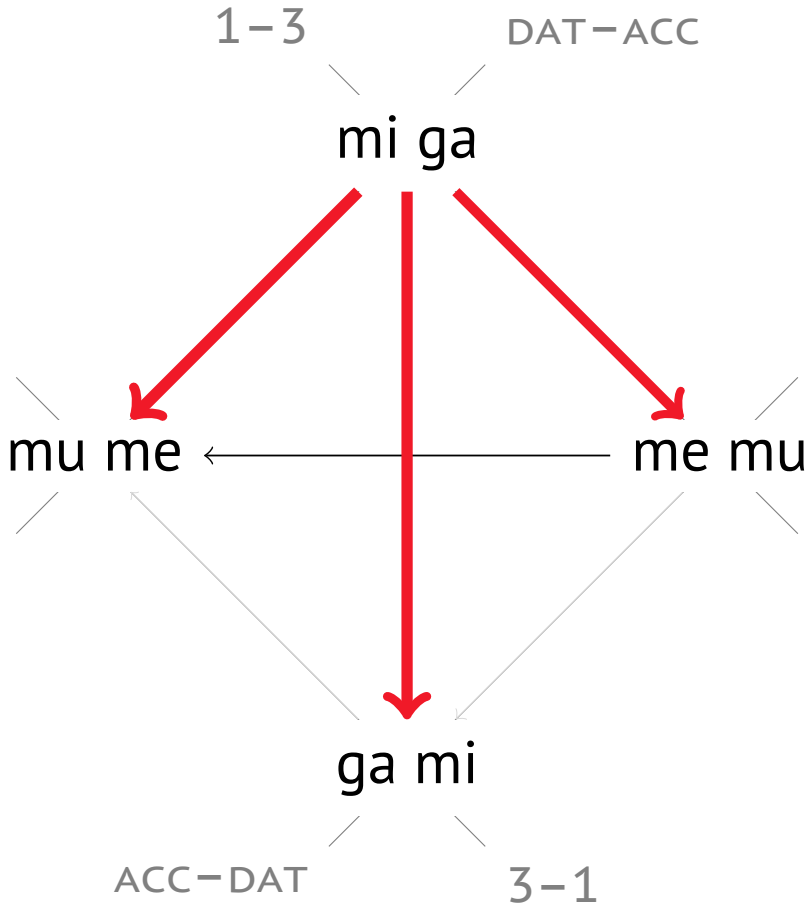

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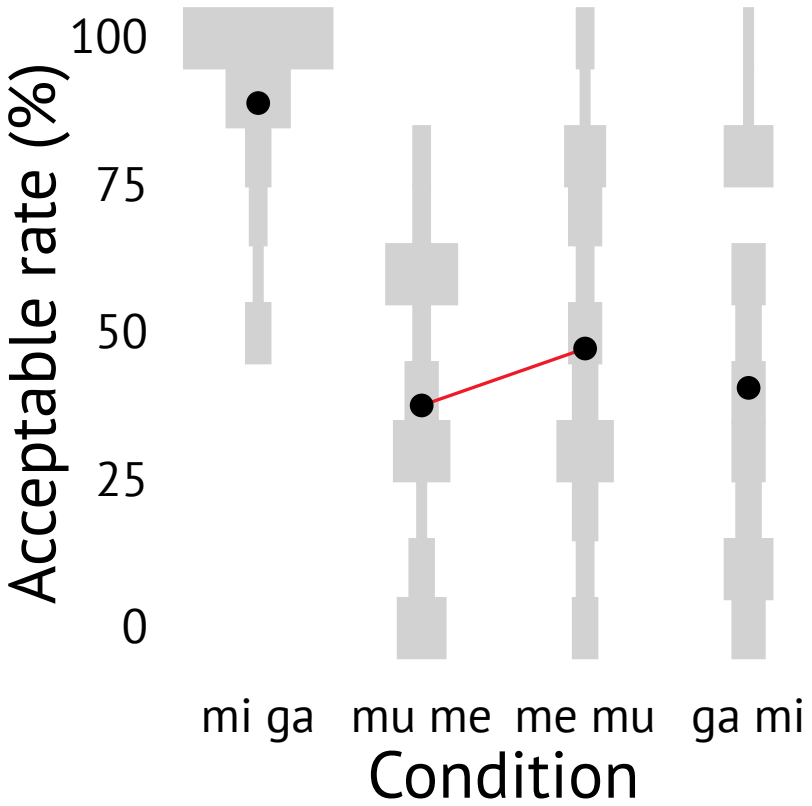

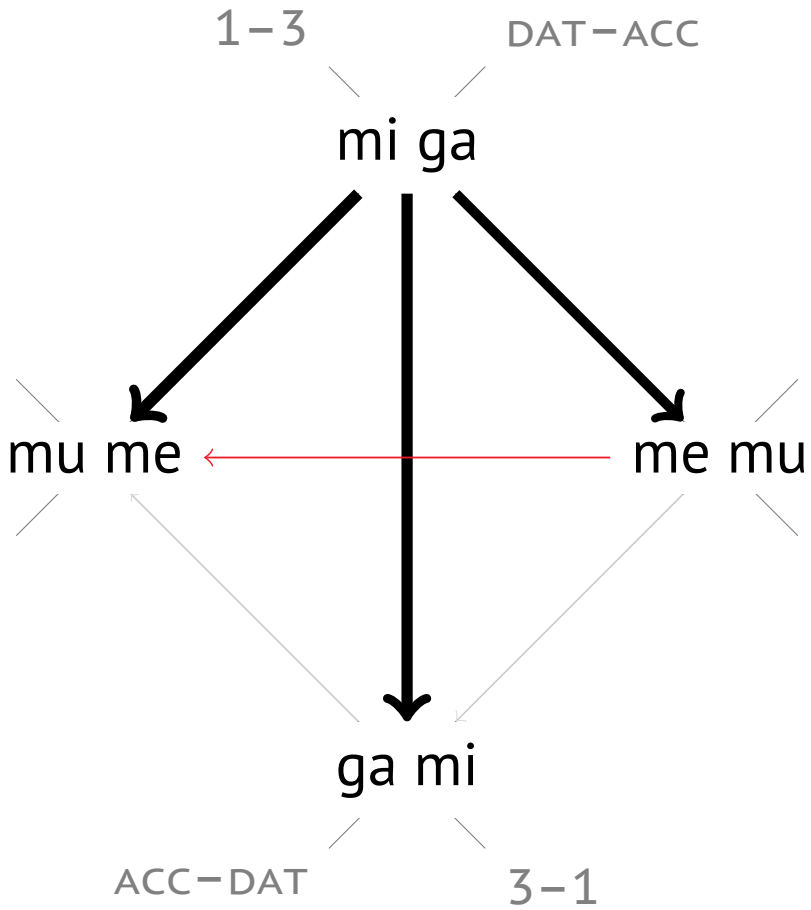

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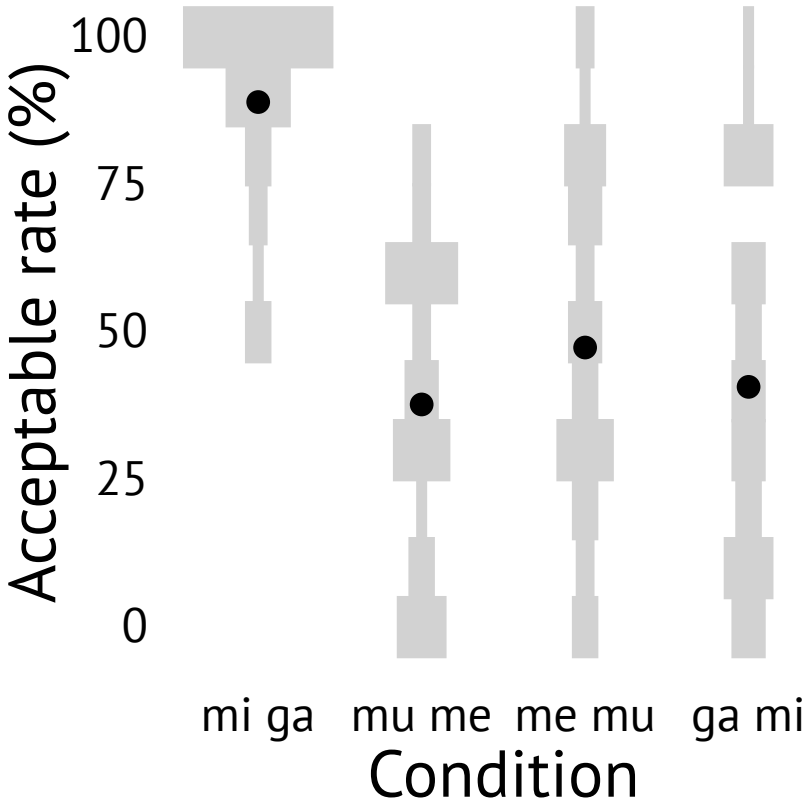

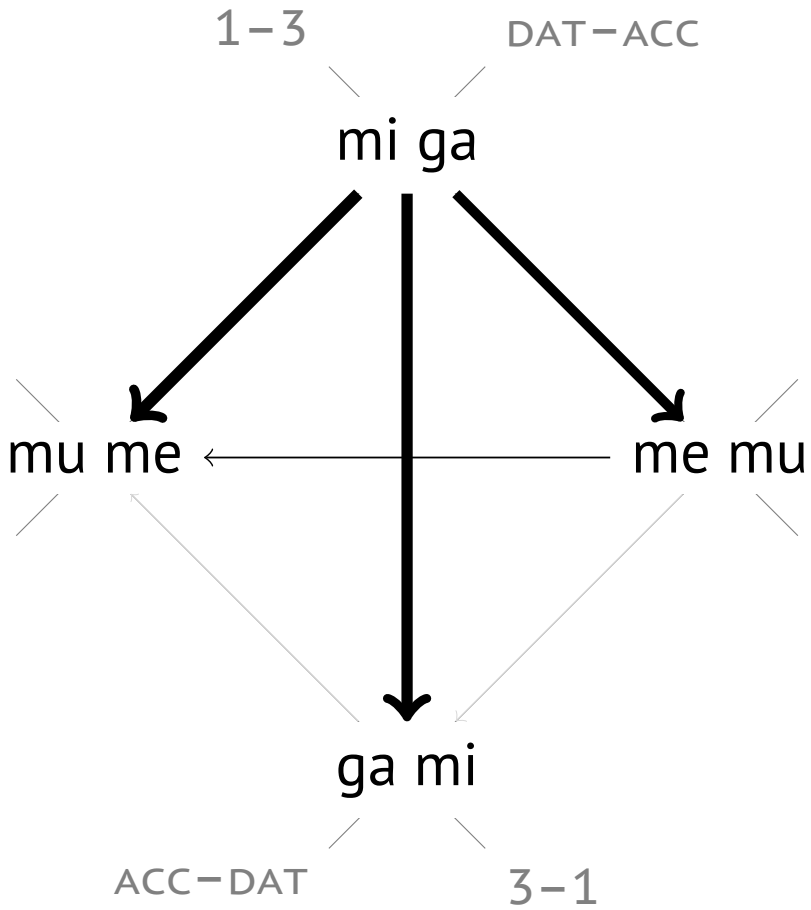

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Outline

Summary

We see two main patterns:

- better for first person to be dative and third person to be accusative
  - experiment 1: comprehension
  - experiment 2: self-paced reading

- canonical order *mi ga* better than the rest
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  syntactically grammatical sentences easier to process and more acceptable

Theoretical implications

- The PCC cannot be reduced to pairings of person and case (the "Ditransitive Person-Role Constraint") (cf. Haspelmath, 2004)
- Only limited evidence supporting accusative–dative order (*me mu*) as a PCC repair strategy (cf. Stegovec, 2020)

Methodological implications

- Psycholinguistic experiments often *assume* that ungrammaticality (such as agreement errors) incurs processing slowdowns (see e.g. Ditman et al., 2007; Mewe, 2020; Wagers et al., 2009)
- Much rarer to use processing slowdowns to *test for* ungrammaticality (Yoshida, 2023)
- By pairing processing measures with others, we can tease results apart into interpretable components, distinguishing grammaticality and processing differently from e.g. Phillips (2006)
- This can help us distinguish *ungrammatical* constructions from those which are merely *rare and confusing* (for example, combinations of accusative and genitive clitics)

Acknowledgements

This work was produced with financial support from Slovenian Research Agency (ARIS) grants P6-0382 and N6-0314 to all authors and Masaryk University grant MUNI/SC/1432/2024 to the first author in the latter stages of preparing results for presentation.

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Statistical modelling

- Mixed linear (self-paced reading) and logistic (comprehension and acceptability) models
- Fixed effects of person order, case order, interaction
- Random intercepts for subject and stimulus
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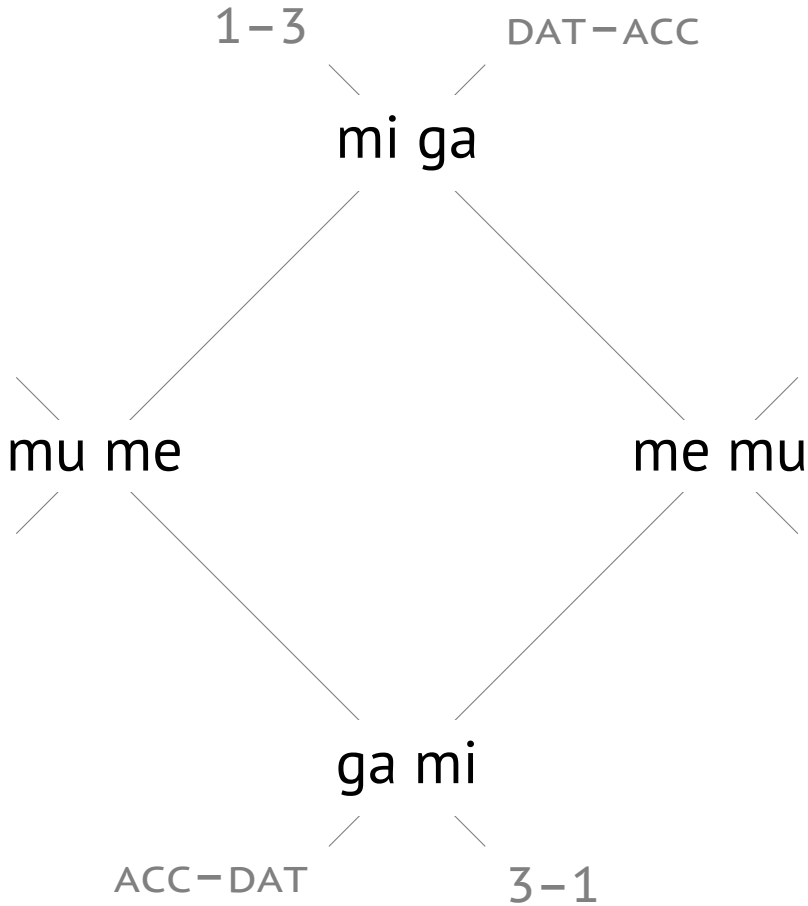

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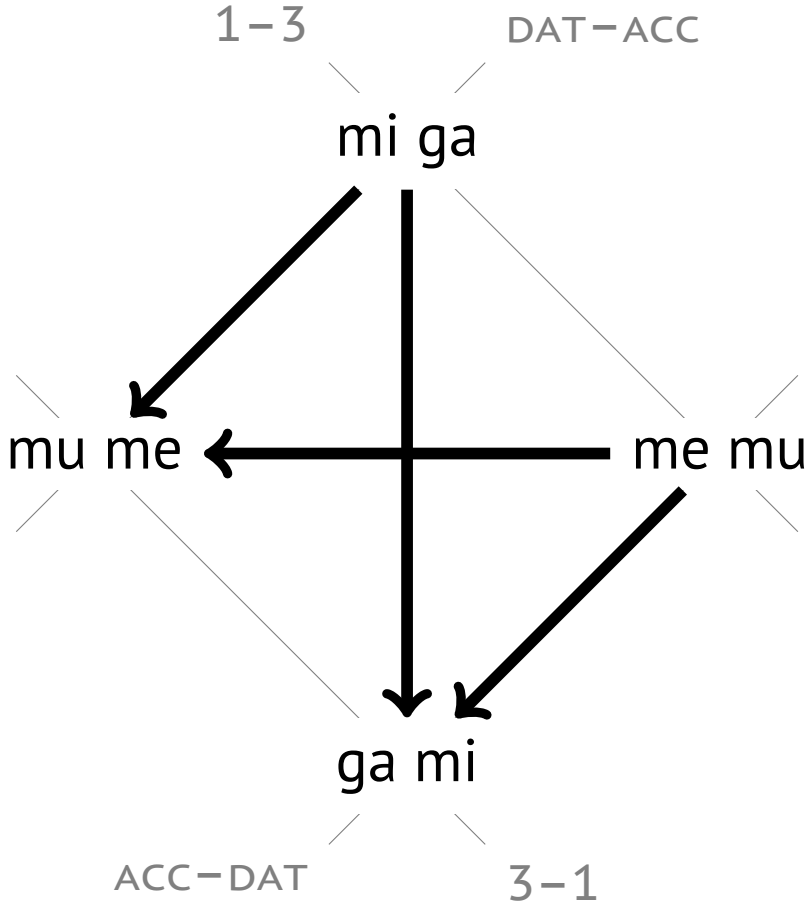

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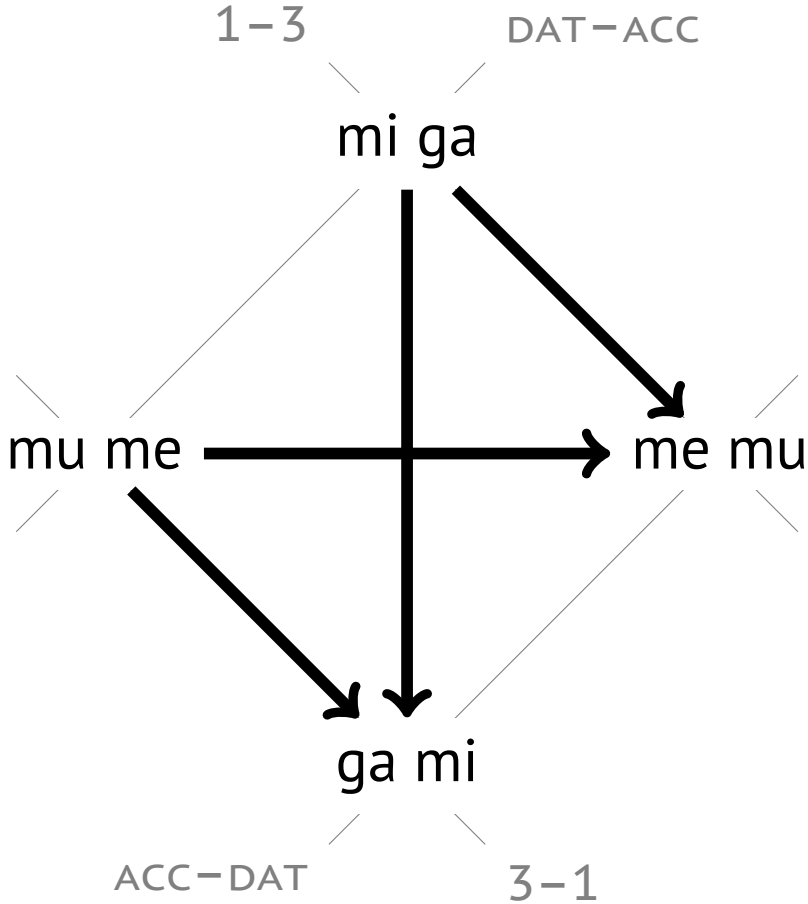

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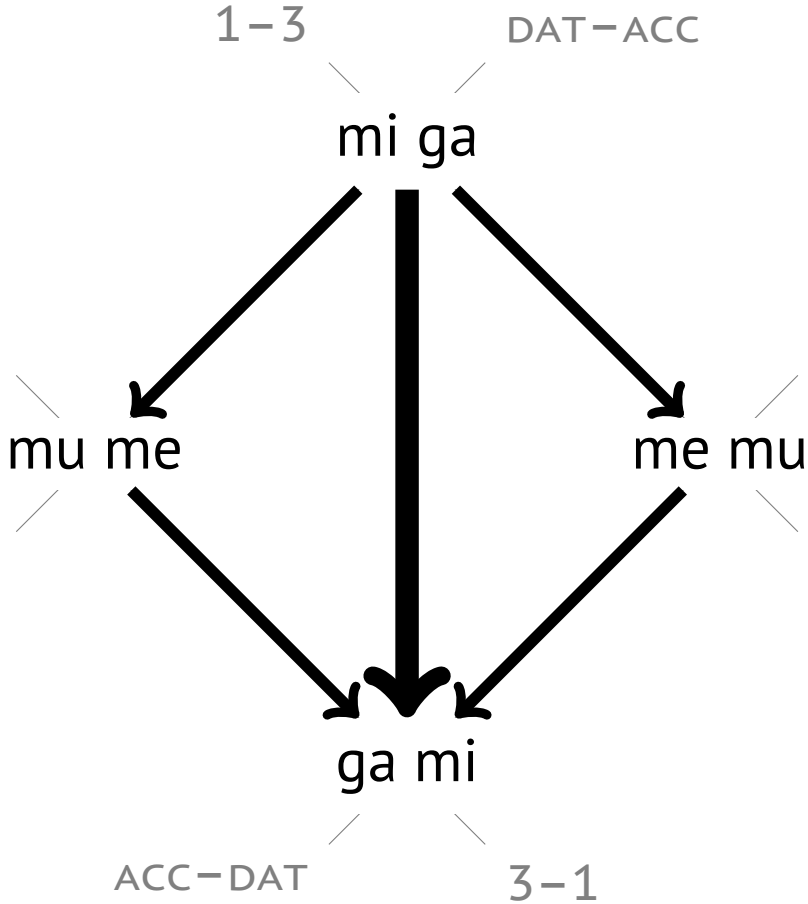

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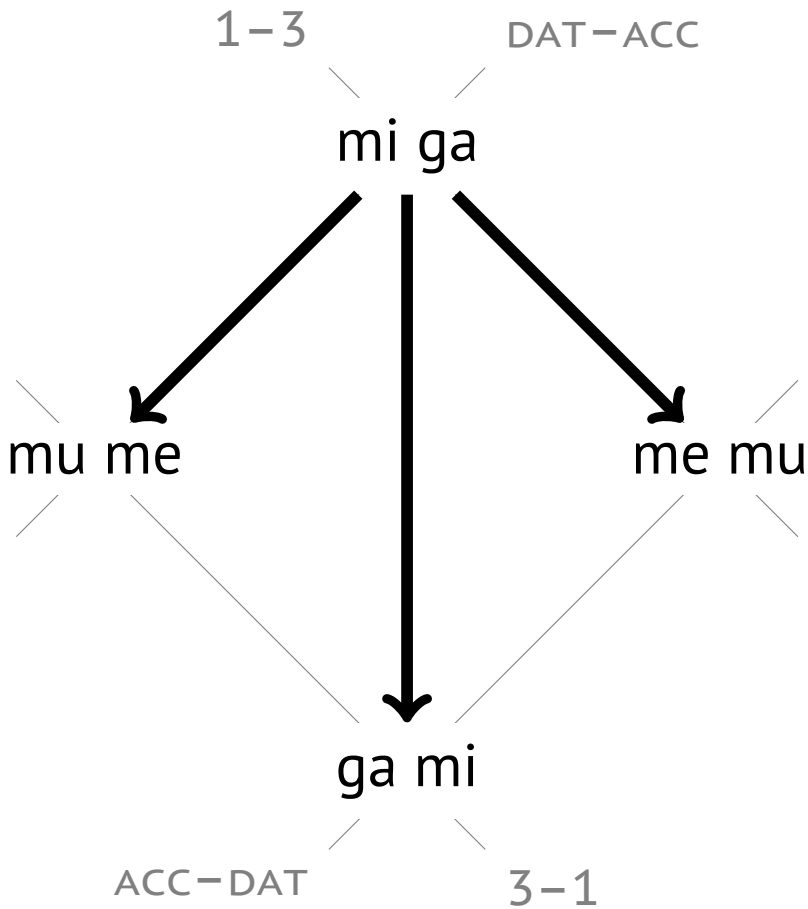

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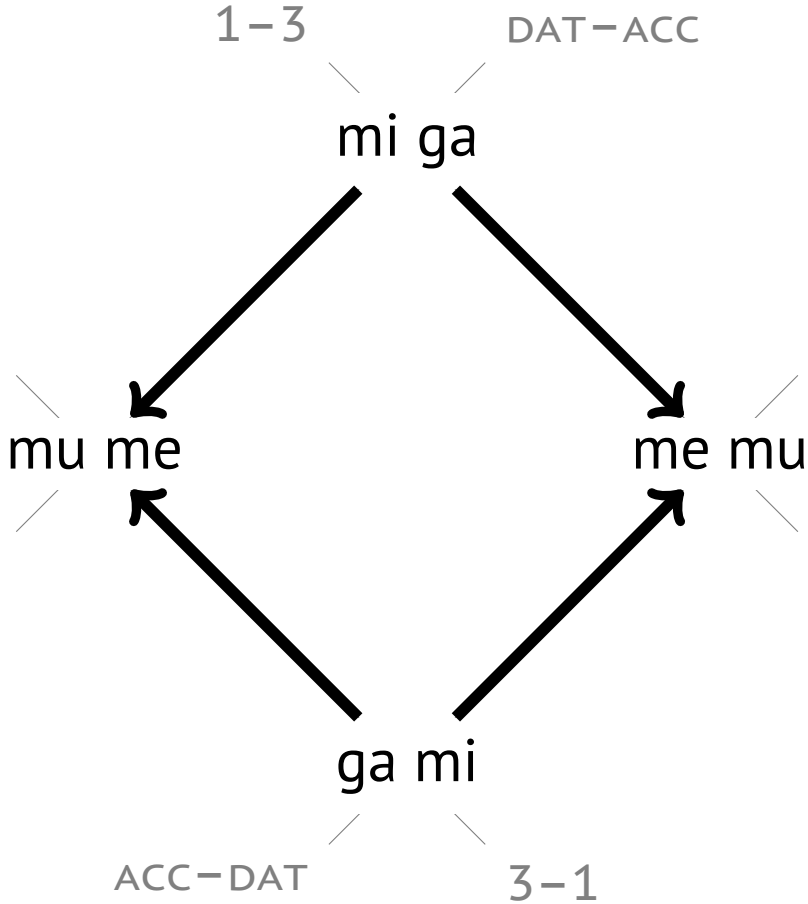
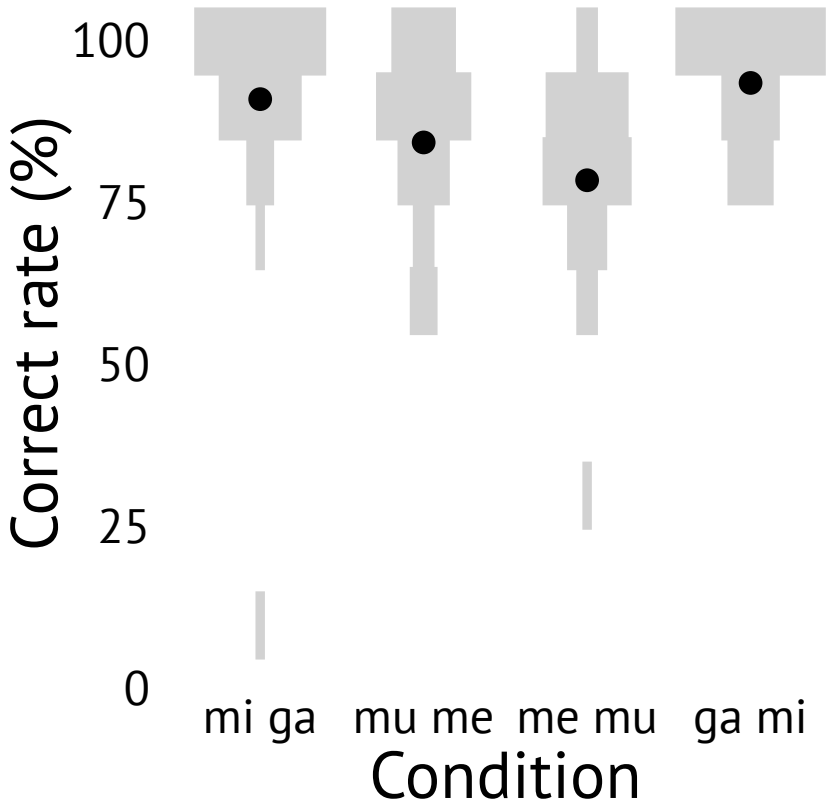
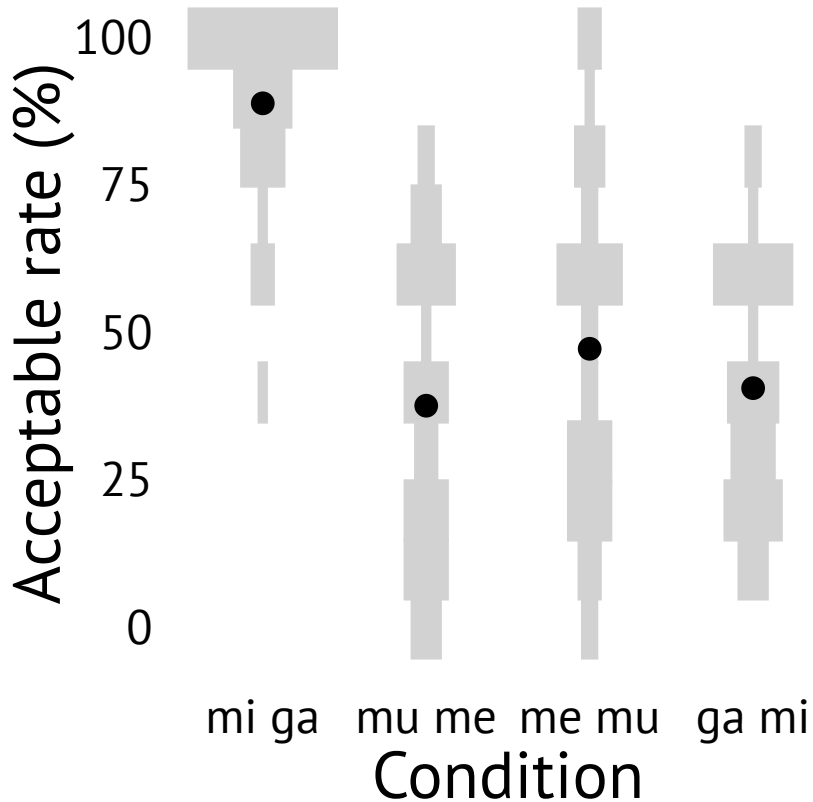
- *mi* and *ga* best: $P = C = -\frac{I}{2}$



Results grouped by stimulus





Speaker differences in acceptability