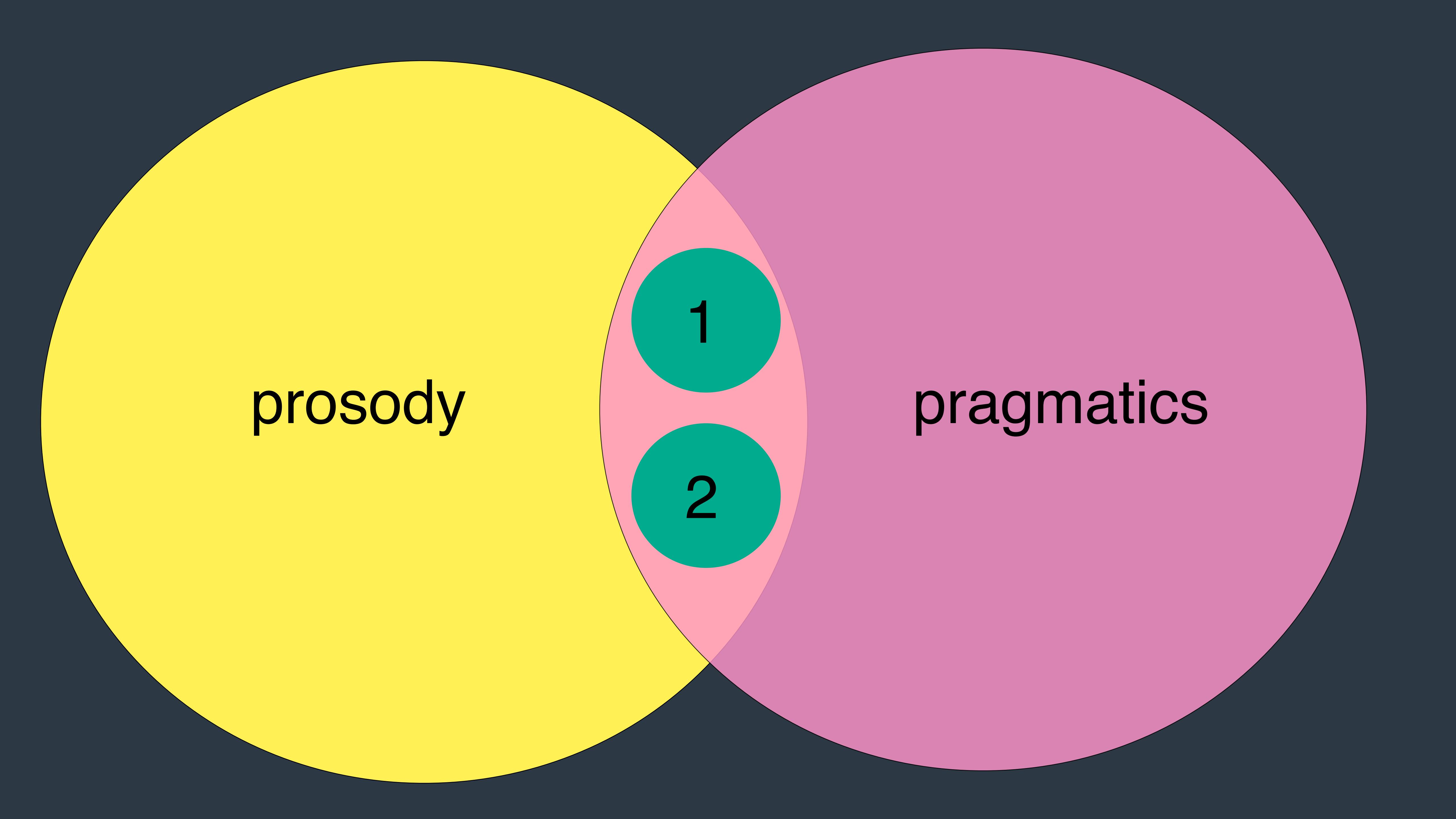


Is Paraguayan Guaraní *=nte* ‘only’ sensitive to prosodically marked focus?

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October 12, 2023
University of Cologne



A Venn diagram consisting of two overlapping circles. The left circle is yellow and labeled 'prosody'. The right circle is pink and labeled 'pragmatics'. The overlapping area contains two teal circles, one labeled '1' and one labeled '2'.

prosody

pragmatics

1

2

1

1

Are projection inferences sensitive to the information structure of the utterance, as predicted by some theoretical analyses?

Scott: “*Does Cole know that Julian dances salsa?*”

→ Scott believes that Julian dances salsa

- Comprehension experiments on American English suggest that a variety of projection inferences are systematically modulated by prosodic correlates of information structural focus.
(e.g., Tonhauser 2016, SALT; Tonhauser, Speer, de Marneffe & Stevens 2019, Sinn und Bedeutung)
- Production experiment on American English suggests that speakers use prosody to distinguish projection from non-projection. (Vaiksnoraite, de Marneffe & Tonhauser 2019, NELS)

2

What are the prosodic correlates of information structural focus in languages that are underrepresented in linguistic research (and their prosodic structures)?

- Paraguayan Guaraní (Tupí-Guaraní), with Cynthia Clopper (Ohio State U)



(Wikimedia)

(Clopper & Tonhauser 2013 (IJAL), Burdin et al 2015 (Lingua), Turnbull et al 2015 (LCN))

- Chodri, Marathi, Gujarati (Indo-Aryan), with Ashwini Deo (UT Austin)



(Wikimedia)

(Deo & Tonhauser 2018, talk presented at U of Konstanz; ms in prep.)

Paraguayan Guaraní [gug]

- Tupí-Guaraní, intensive contact with Spanish for 400+ years
- Official language of Paraguay, besides Spanish
- About six million speakers, a large majority of which is not exclusively indigenous (Estigarribia 2020)
- Yearly fieldwork on the language between 2004-2016 on a wide range of topics (e.g., tense/aspect/modality, evidentiality, presuppositions, information structure, argument realization)



(Wikimedia)

Paraguayan Guaraní =nte ‘only’ is an enclitic

=nte ‘only’ cliticizes to a wide variety of expressions, including proper names, verbs, (pro)nouns, adjectives, adverbs...

Kuehe Láura=**nte** o-purahéi.
yesterday Laura=only 3-sing
‘Yesterday only LAUra sang.’



context in which Laura sang and danced,
others only danced



context in which Laura sang and
danced, like others, too

Kuehe Láura o-purahéi=**nte**
yesterday Laura 3-sing=only
‘Yesterday Laura only SANG.’



context in which Laura sang, others sang
and danced



context in which Laura sang and
danced, like others, too.

The associate of *=nte* ‘only’ is the expression it cliticizes to

=nte ‘only’ cliticizes to a wide variety of expressions, including proper names, verbs, (pro)nouns, adjectives, adverbs...

Kuehe Láura=*nte* o-purahéi.
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'Yesterday Laura only SANG.'



context in which Laura sang, others sang
and danced



context in which Laura sang and
danced, like others, too.

English *only* is focus sensitive

(e.g., Paul 1888, Kuroda 1965, Fischer 1968, Beaver & Clark 2008)

Juan o-vende vaka María-pe=**nte**.
Juan 3-sell cow Maria-to=only

Juan only sold a cow to MARY.

Juan o-vende vaka=**nte** María-pe.
Juan 3-sell cow=only Maria-to

Juan only sold a COW to Mary.

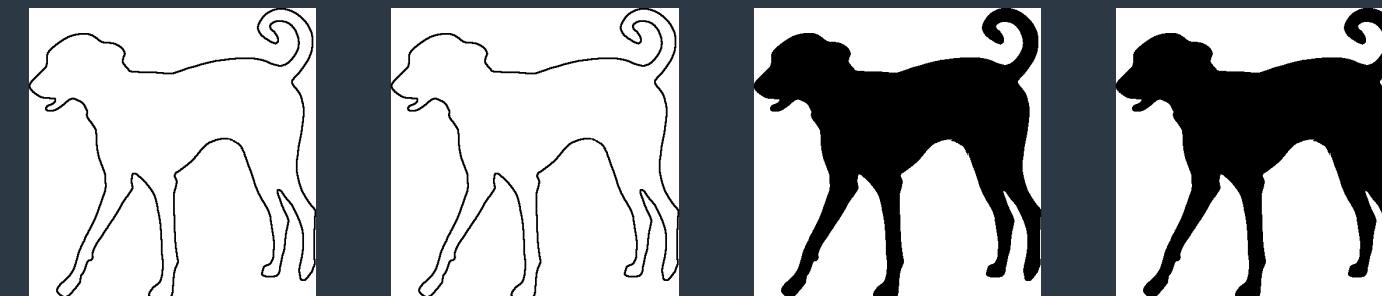
- Paraguayan Guaraní variants differ what *=nte* ‘only’ cliticizes to.
- Does the fact that Paraguayan Guaraní *=nte* ‘only’ is an enclitic mean that there is no pressure for it to be sensitive to prosodically marked focus?

No!

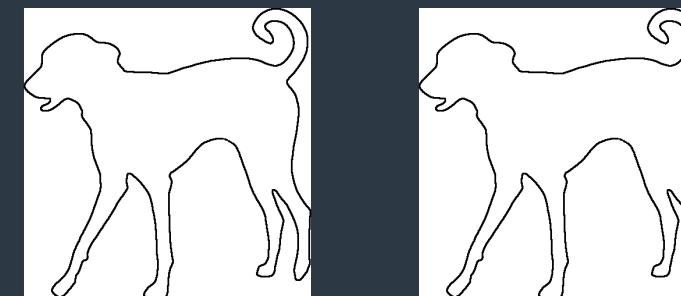
=nte 'only' can cliticize to complex expressions

Ko'āga a-guereko [jagua morotī]=nte. *Ko'āga a-guereko [jaguá=nte morotī].
now 1sg-have dog white=only
'Now I only have white dogs.'

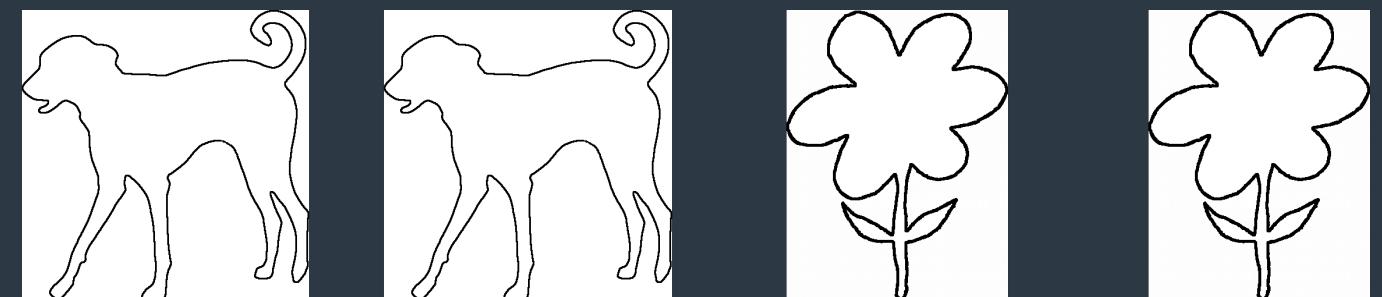
What I used to have:



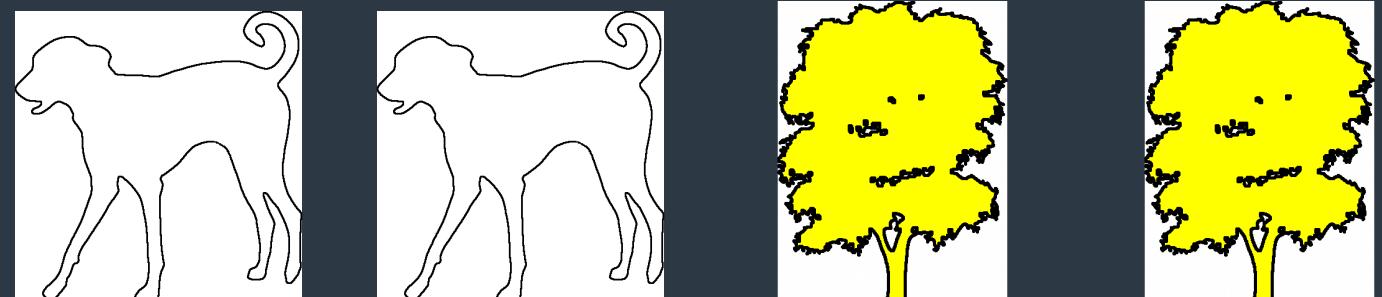
What I now have:



[adjective focus]



[noun focus]



[NP focus]

=nte ‘only’ can cliticize to complex expressions

Ko'āga a-guereko [jagua morot̄i]*=nte*.
now 1sg-have dog white=only
'Now I only have white dogs.'

Is Paraguayan Guaraní *=nte* ‘only’ sensitive to prosodically marked focus when it cliticizes to complex noun phrases?

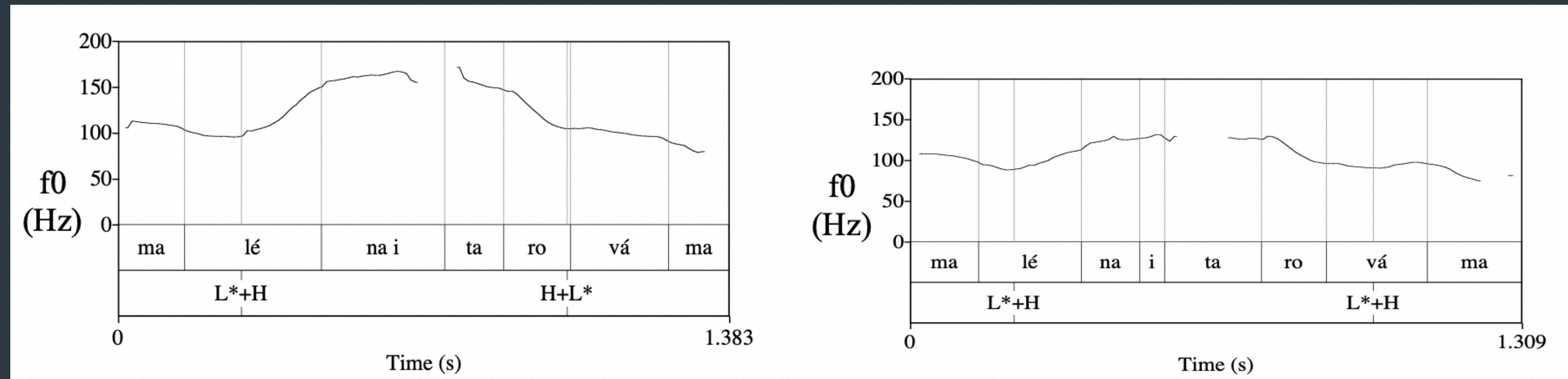
- Production experiment (10 Paraguayan Guaraní talkers)
- Comprehension experiment (26 Paraguayan Guaraní participants)

[collected in December 2013/January 2014 in Paraguay]

Background on Paraguayan Guaraní prosody

Clopper & Tonhauser 2013, Burdin et al 2015 (*Lingua*), Turnbull et al 2015 (*Language, Cognition, and Neuroscience*)

- Stress is lexically specified (Gregores & Suárez 1967) and stressed syllables can receive pitch accents (Clopper & Tonhauser 2013).
- Two pitch accents: LH (rise), HL (fall) (boundary tones: L%, H%)



Clopper & Tonhauser 2013, Fig. 2

- No evidence to date of phrasing between the levels of the word and the intonational phrase.

**Jun et al 2023 proposed an analysis with a trivalent pitch accent: HLH*

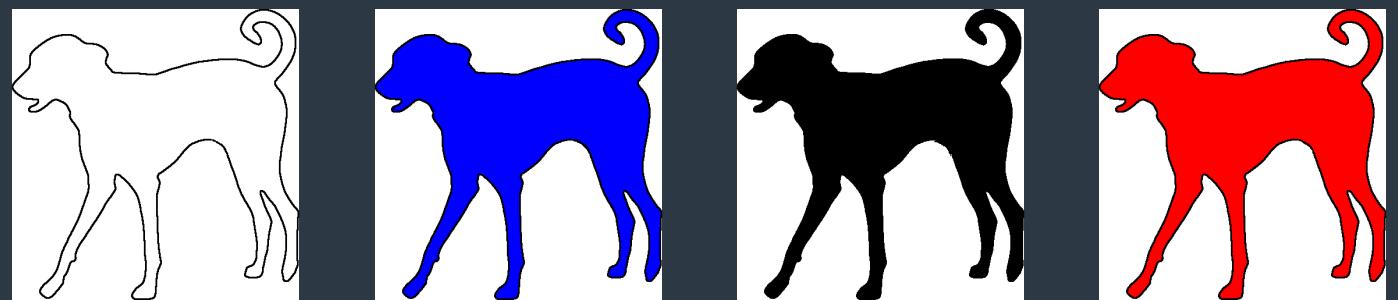
Previous production experiment on complex NPs

Burdin et al 2015 (Lingua), Turnbull et al 2015 (Language, Cognition, and Neuroscience)

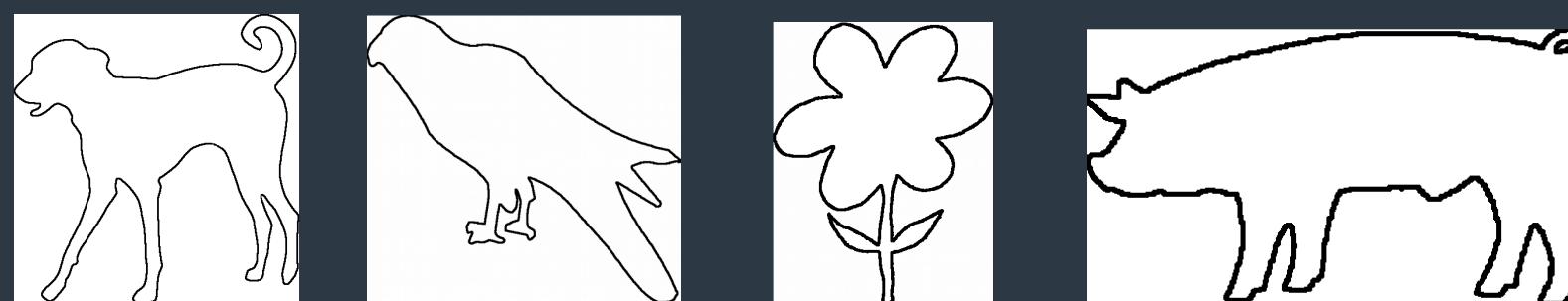
Interactive task between two Paraguayan Guaraní talkers to collect productions in adjective focus, noun focus, and NP focus conditions.

Director:

E-mōi [jagua morot̄i] petē-me
2sg-put dog white one-in
'Put the white dog in [box] one.'

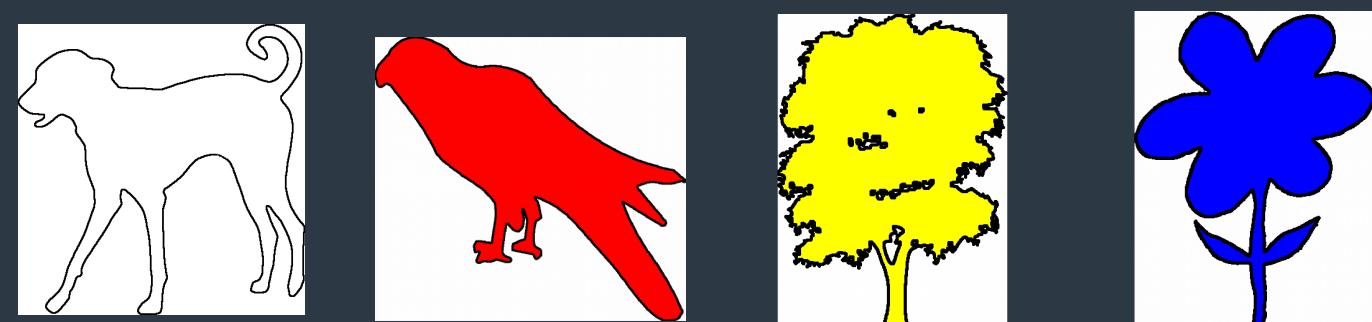


[adjective focus]



[noun focus]

The Follower's task was to put the objects into the right boxes.
("What should I put where?")



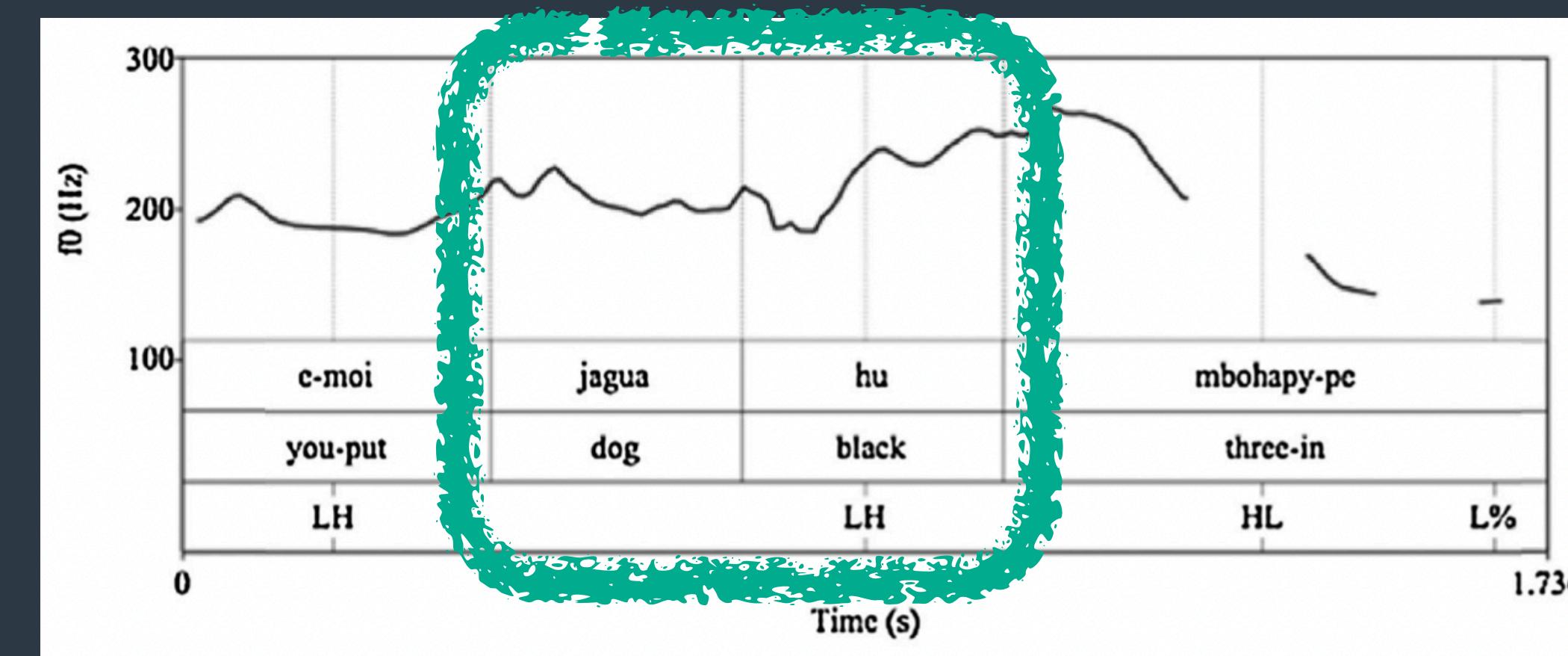
[NP focus]

Previous production experiment on complex NPs

Burdin et al 2015 (Lingua), Turnbull et al 2015 (Language, Cognition, and Neuroscience)

Interactive task between two Paraguayan Guaraní talkers to collect productions in adjective focus, noun focus, and NP focus conditions.

E-mo̩
2sg-put [jagua morot̩] pete̩-me
dog white one-in
'Put the white dog in [box] one.'



Burdin et al
2015, Fig. 3

1. Presence of a pitch accent: Most adjectives had a pitch accent, but nouns were frequently unaccented. Nouns were more likely to be unaccented in the adjective focus condition, compared to the noun or NP focus condition.

Previous production experiment on complex NPs

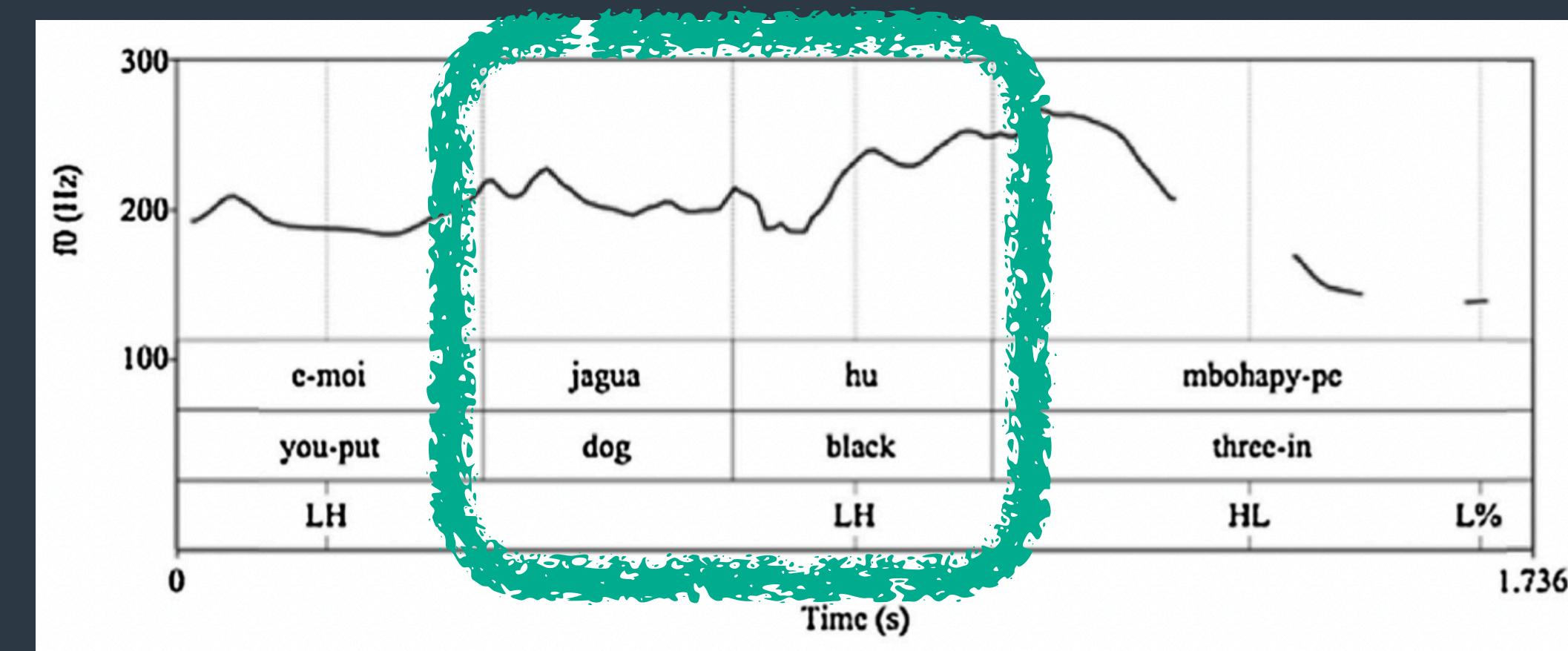
Burdin et al 2015 (Lingua), Turnbull et al 2015 (Language, Cognition, and Neuroscience)

Interactive task between two Paraguayan Guaraní talkers to collect productions in adjective focus, noun focus, and NP focus conditions.

E-moī [jagua morotī] peteī-me
2sg-put dog white one-in
'Put the white dog in [box] one.'

2. Type of pitch accent:

- Clopper & Tonhauser 2013: Focused subjects and verbs realize more LH than nonfocused ones.
- Burdin et al 2015: Focus condition was not a significant predictor of PA type.
- Turnbull et al 2015: For nouns, more LH in noun focus than NP focus. For adjectives, more HL in adjective than in noun and NP focus (HL is marked).



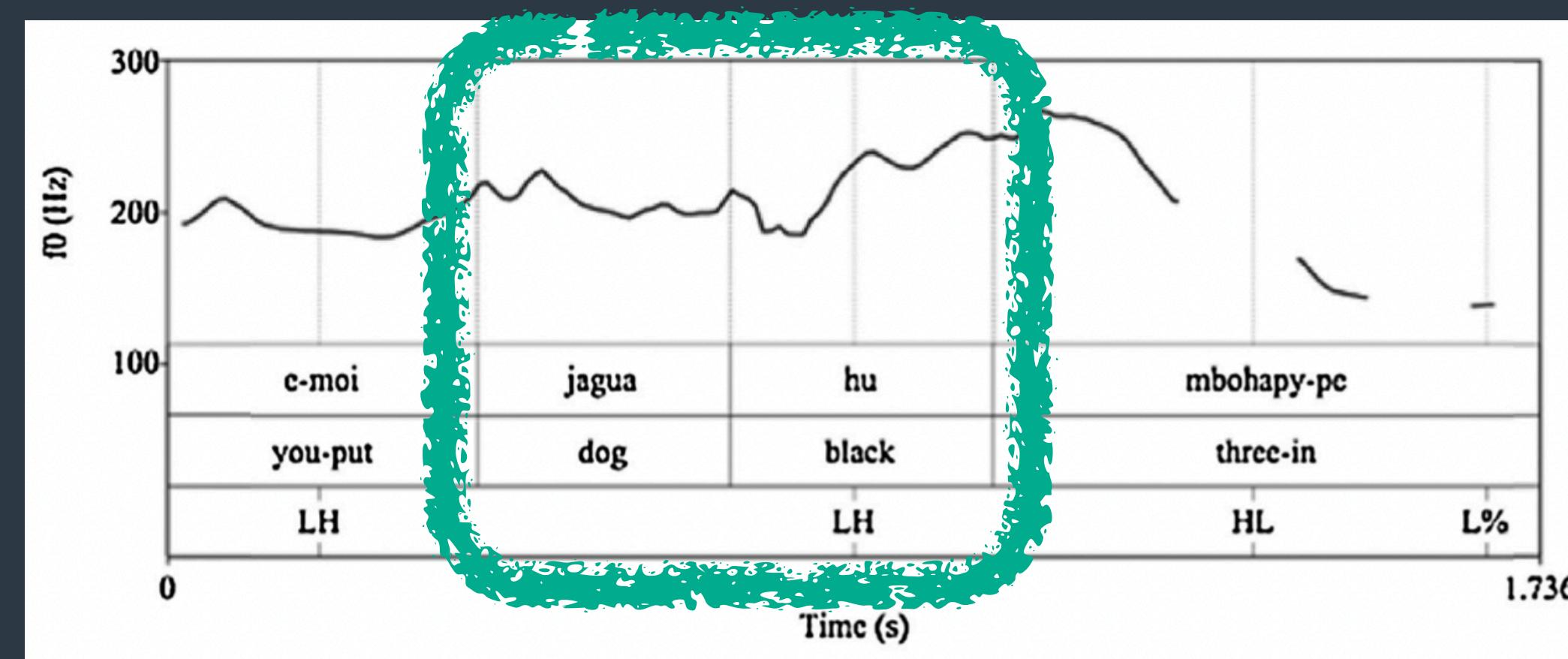
Burdin et al
2015, Fig. 3

Previous production experiment on complex NPs

Burdin et al 2015 (Lingua), Turnbull et al 2015 (Language, Cognition, and Neuroscience)

Interactive task between two Paraguayan Guaraní talkers to collect productions in adjective focus, noun focus, and NP focus conditions.

E-mo̩
2sg-put [jagua morot̩] pete̩-me
dog white one-in
'Put the white dog in [box] one.'



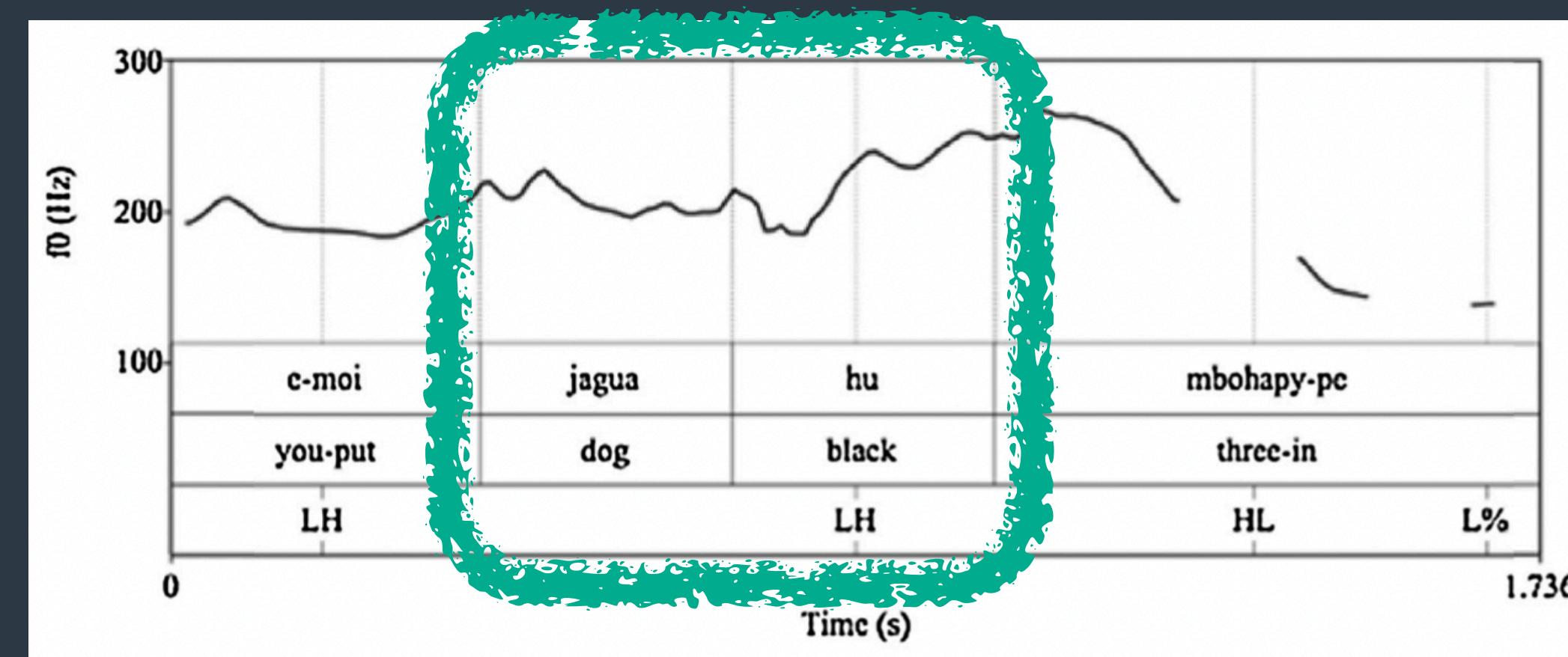
3. Duration: Nouns were longer in NP and noun focus conditions (than adjective focus condition), adjectives were longer in NP focus condition (than the other two conditions).

Previous production experiment on complex NPs

Burdin et al 2015 (Lingua), Turnbull et al 2015 (Language, Cognition, and Neuroscience)

Interactive task between two Paraguayan Guaraní talkers to collect productions in adjective focus, noun focus, and NP focus conditions.

E-moĩ [jagua morotĩ] peteĩ-me
2sg-put dog white one-in
'Put the white dog in [box] one.'



Burdin et al 2015, Fig. 3

4. Slope of rises: Adjectives in adjective focus condition have a sleeper rise than adjectives in the other two focus conditions (Clopper & Tonhauser 2013, not found in Turnbull et al 2015).

Production experiment

Ko'āga a-guereko [jagua morot̄i]=nte.
now 1sg-have dog white=only
'Now I only have white dogs.'

Do Paraguayan Guaraní talkers realize complex noun phrases differently depending on which expression =nte 'only' associates with?

Participants

- 13 self-declared native speakers of Paraguayan Guaraní (7 female, 6 male) participated in the experiment. All were bilingual in Spanish.
- The data from 10 talkers (6 female, 4 male) were analyzed (two produced many disfluent utterances; one didn't find *=nte* 'only' acceptable in the target sentences).

Materials and procedure

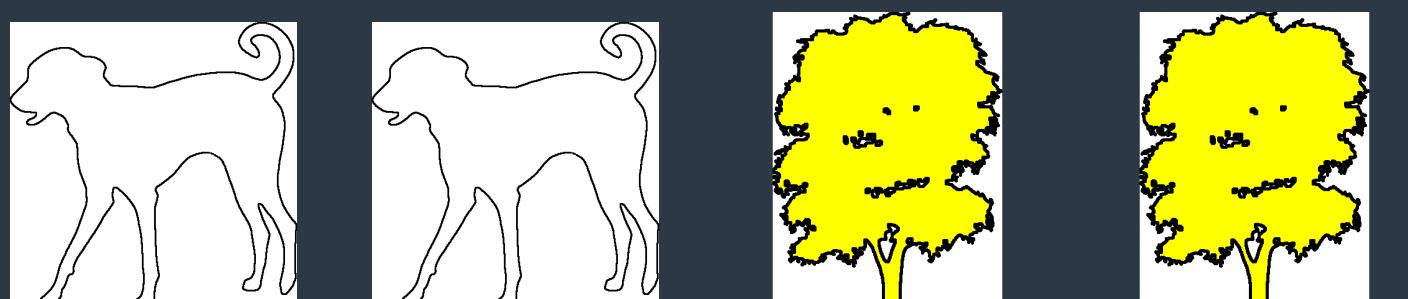
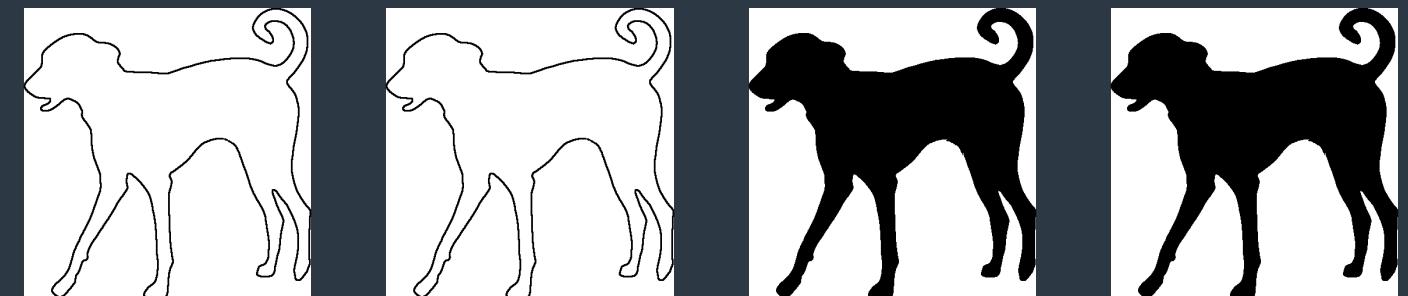
Ko'āga a-guereko [jagua morotī]=nte.
now 1sg-have dog white=only
'Now I only have white dogs.'

[8 target sentences]
(dog, pig, bird, flower)
(white, black, red, yellow, blue)

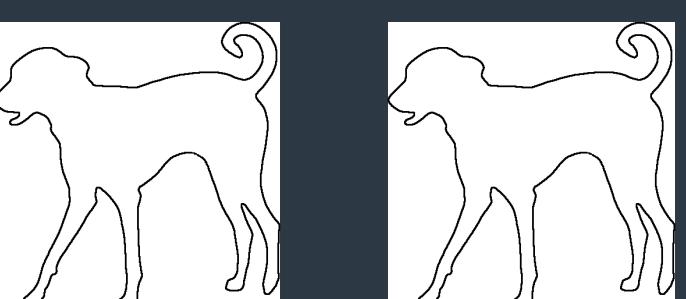
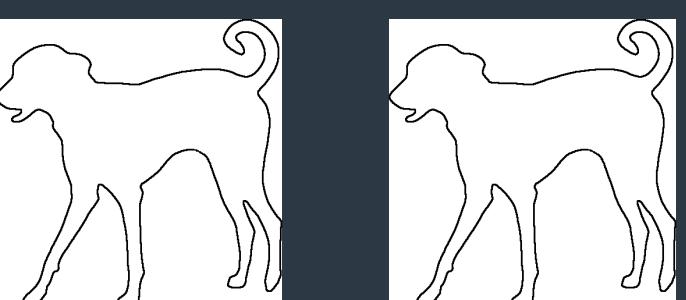
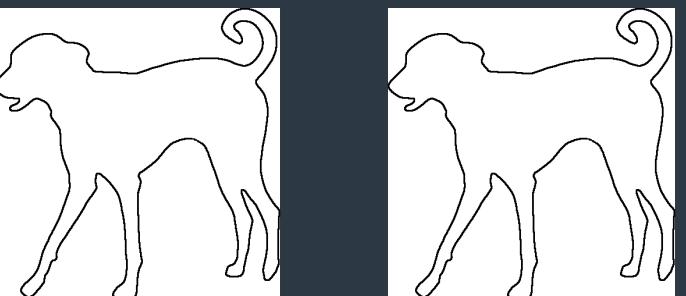
What I used to have:

x 3 focus conditions

= 24 target utterances



What I now have:



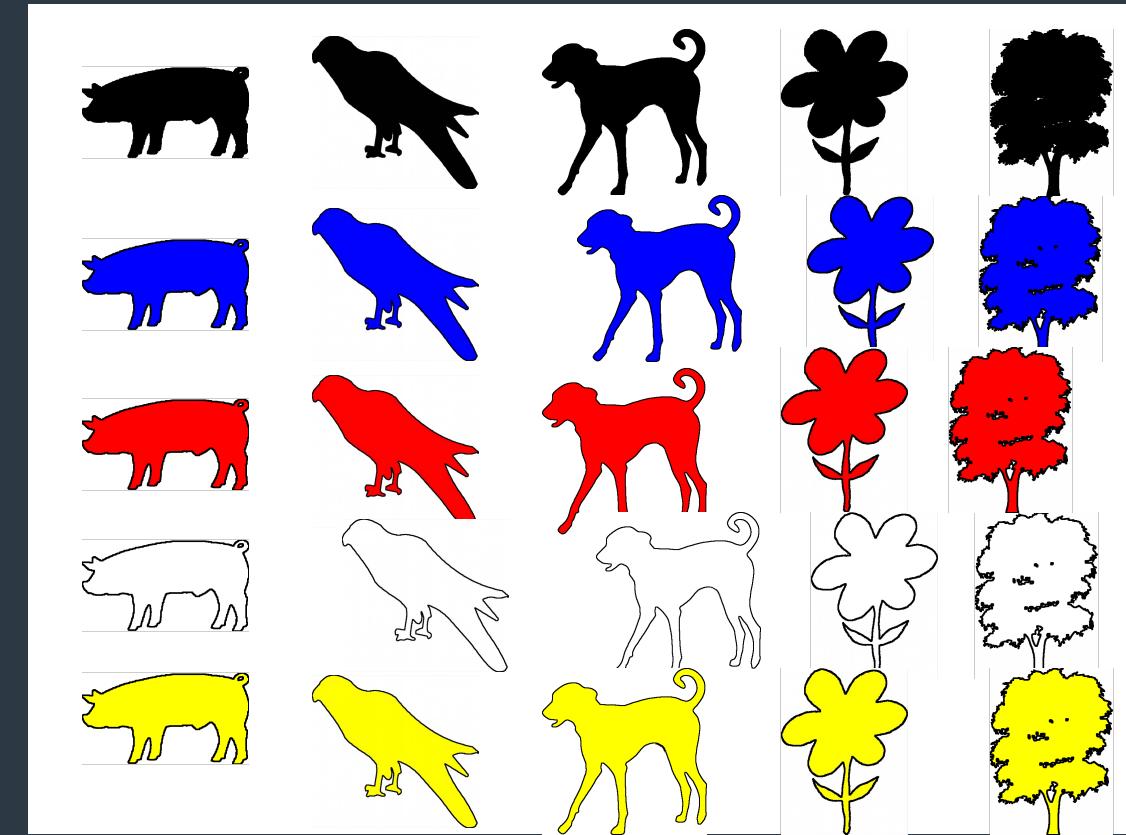
[adjective focus]

[noun focus]

[NP focus]

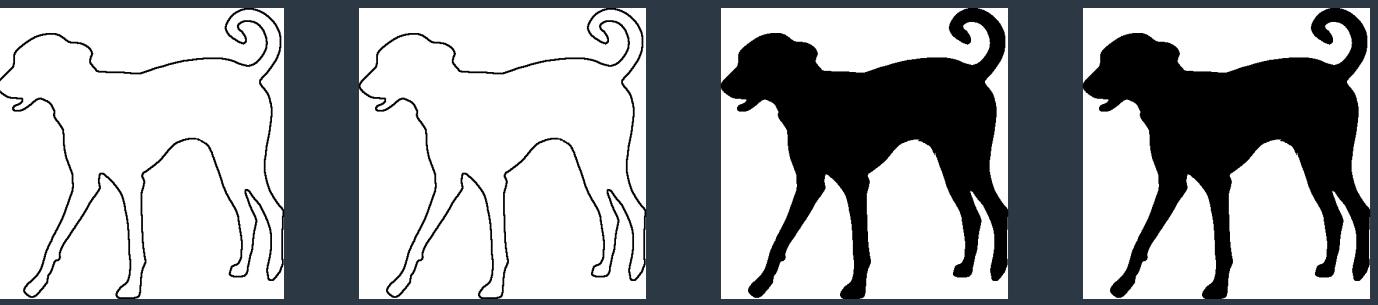
Procedure

- Participants were seated in front of my laptop and shown a Powerpoint presentation.
- They were first familiarized with the various entities and colors.



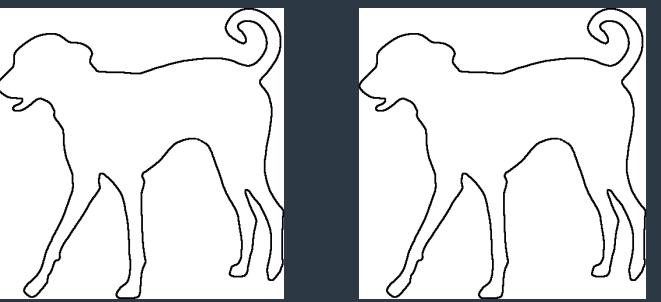
- Then there were two practice trials, to familiarize them with the task. On each trial, participants first described what they have, and then what they now have.

Sample adjective focus trial



A-guereko jagua hu ha jagua morot̄i.
1sg-have dog black and dog white
'I have black dogs and white dogs.'

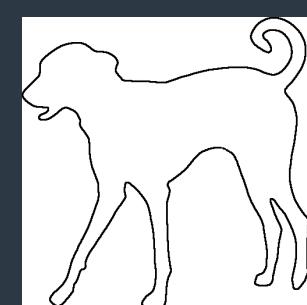
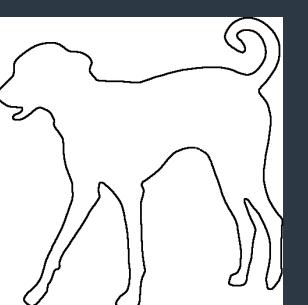
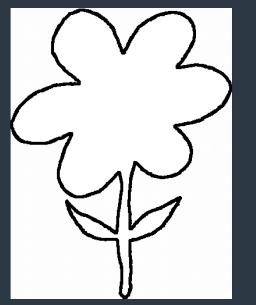
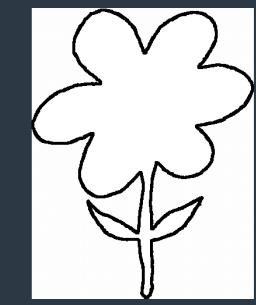
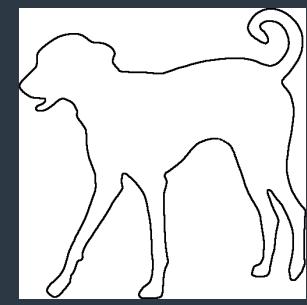
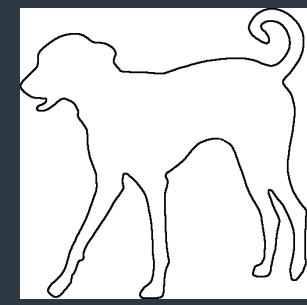
Sample adjective focus trial



Ko'āga a-guereko jagua morotī=nte.
now 1sg-have dog white=only
'Now I only have white dogs.'

Across the trials, the entities that disappeared occurred in different positions relative to the entities that did not disappear (to the right, left, above, below).

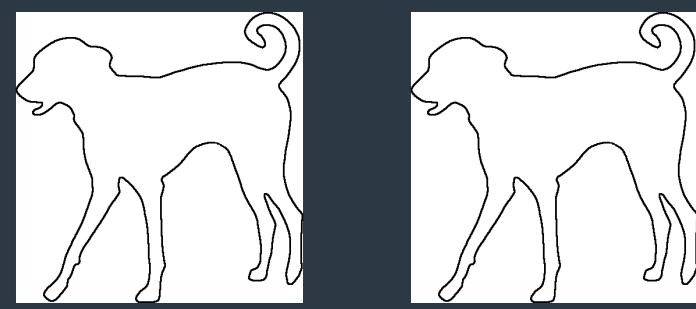
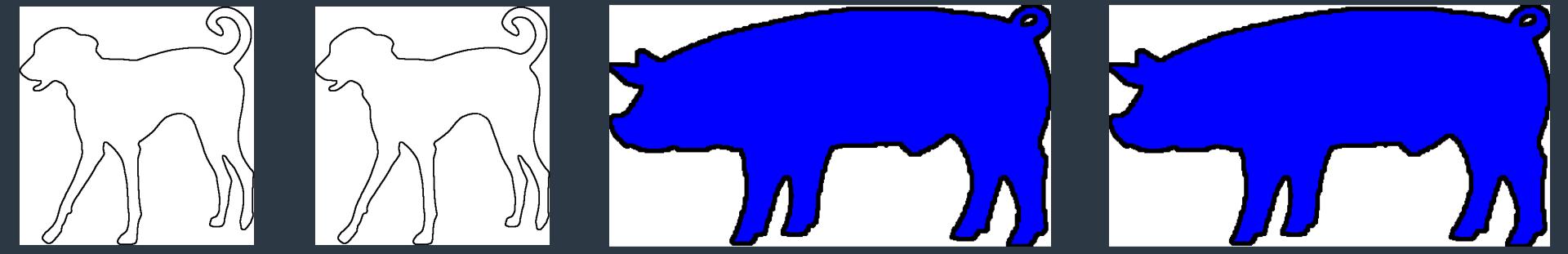
Sample noun focus trial



A-guereko jagua morot̄i ha yvoty morot̄i.
1sg-have dog white and flower white
'I have white dogs and white flowers.'

Ko'āga a-guereko jagua morot̄i=nte.
now 1sg-have dog white=only
'Now I only have white dogs.'

Sample NP focus trial



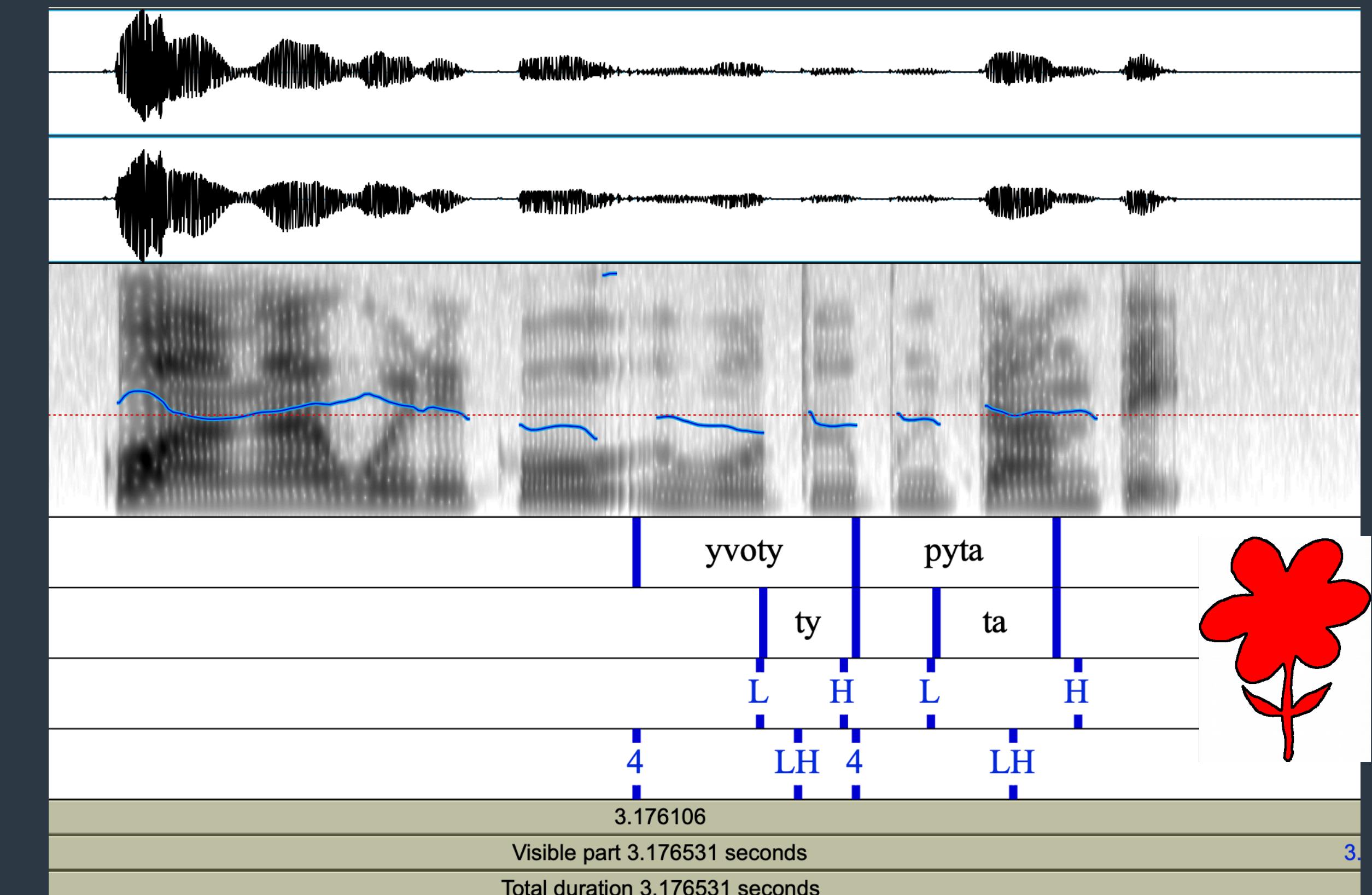
A-guereko jagua morotī ha kure hovy.
1sg-have dog white and tree blue
'I have white dogs and blue pigs.'

Ko'āga a-guereko jagua morotī=nte.
now 1sg-have dog white=only
'Now I only have white dogs.'

8 filler trials (which used shapes and colors not used in the target trials) distracted participants from the fact that they saw each target sentence three times.

Analysis

- 240 total utterances were analyzed (24 utterances x 10 talkers).
- 4 disfluent utterances were excluded (3 in NP condition, 1 in noun condition)
- Annotated for the noun and adjective:
 1. presence of pitch accent
 2. type of pitch accent (LH, HL)
 3. beginning and end, to extract duration
 4. L and H of pitch accents, to calculate the slope (range / time)



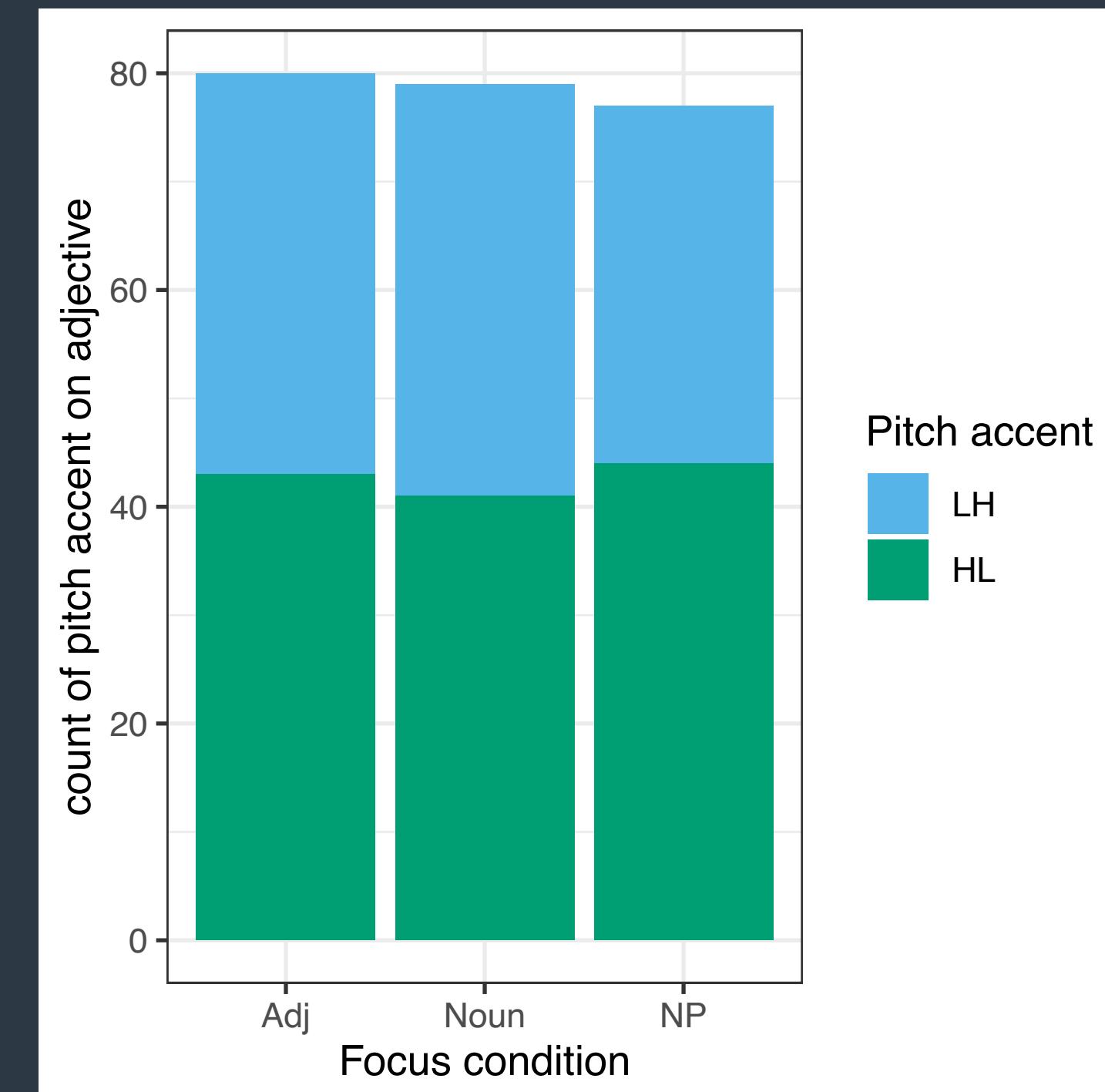
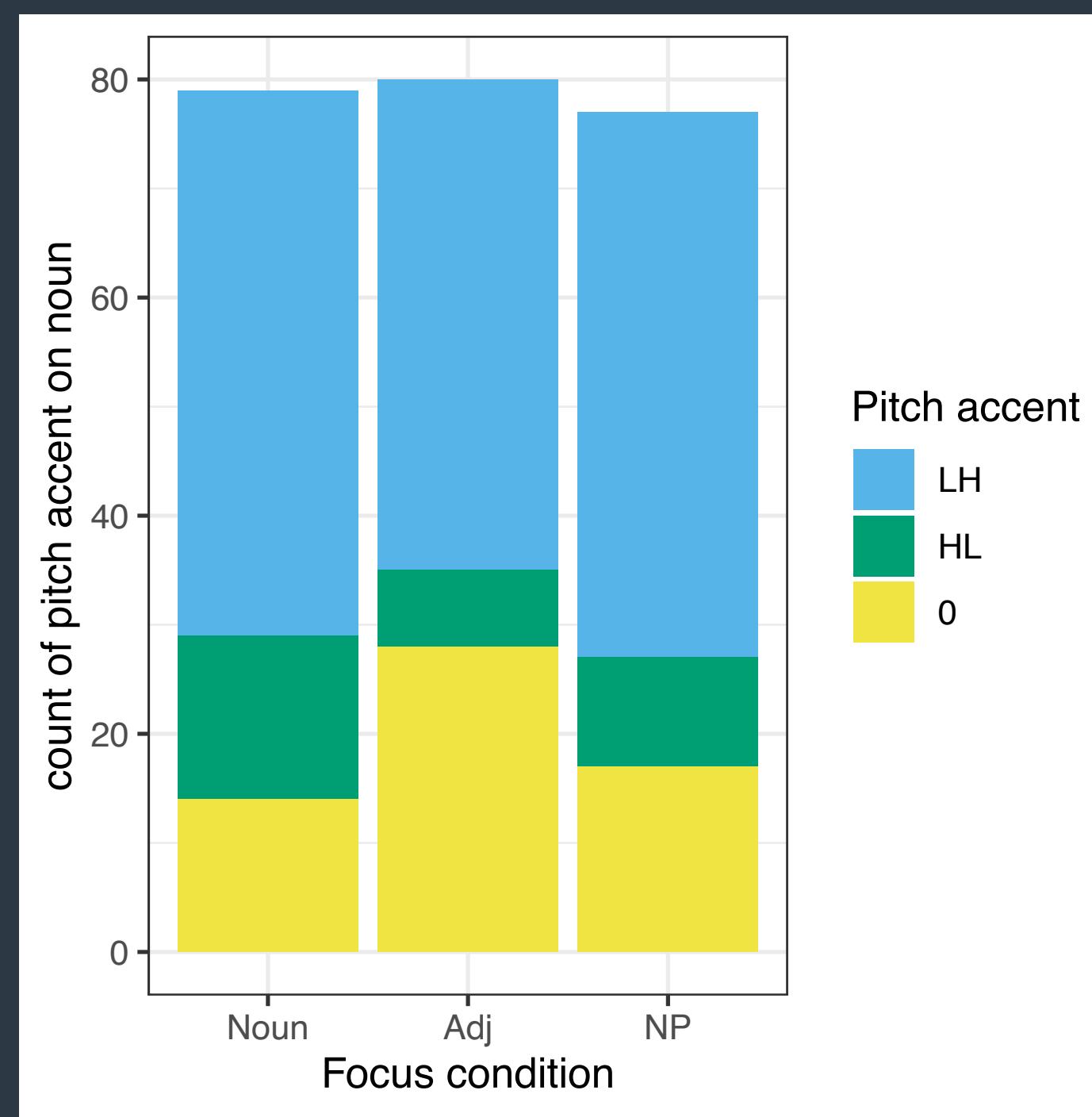
Results: Presence of pitch accent, type of pitch accent

Nouns were more likely to be unaccented in the adjective focus condition.

Focus condition was not a significant predictor of pitch accent type.

Adjectives were never unaccented.

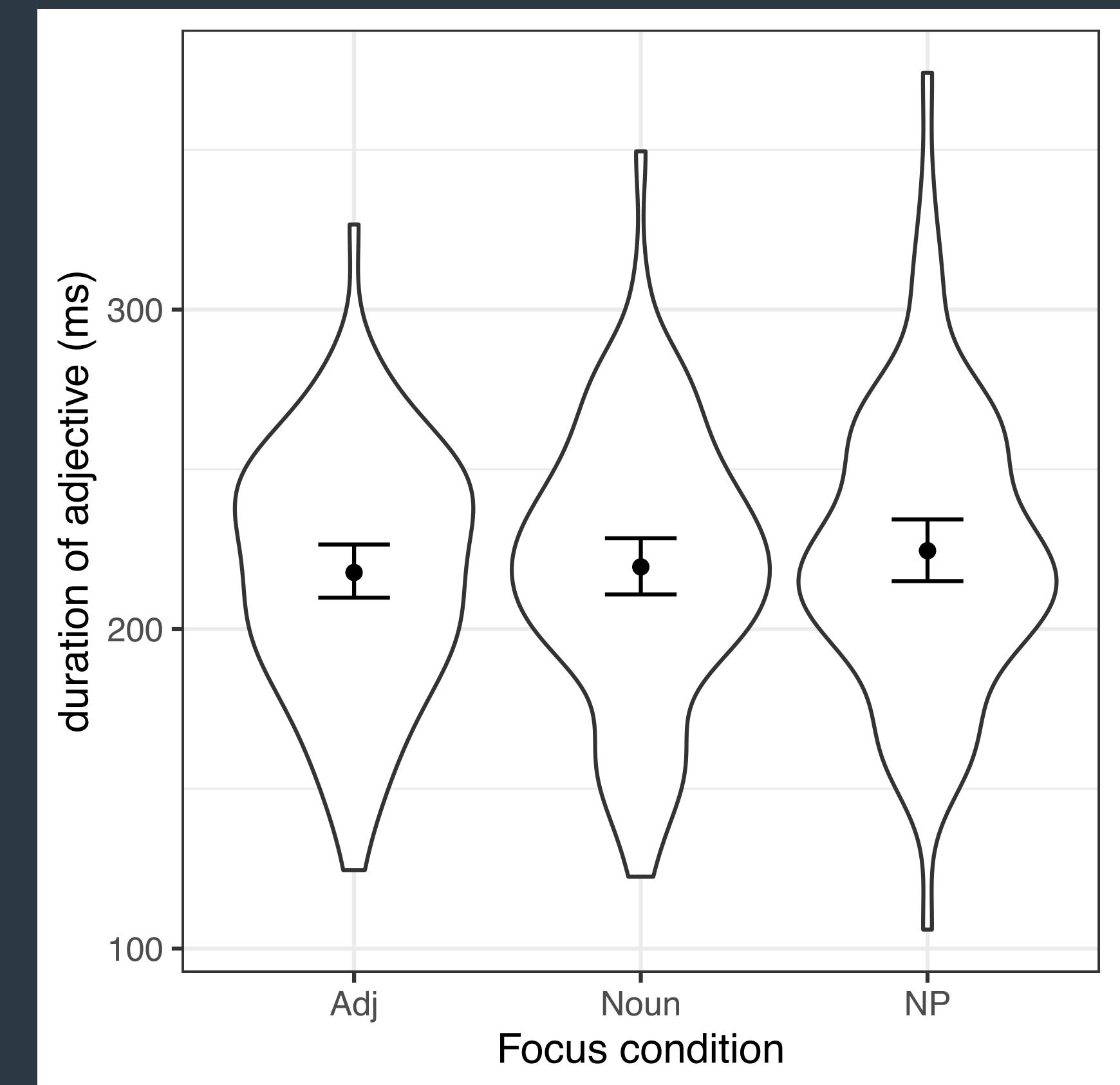
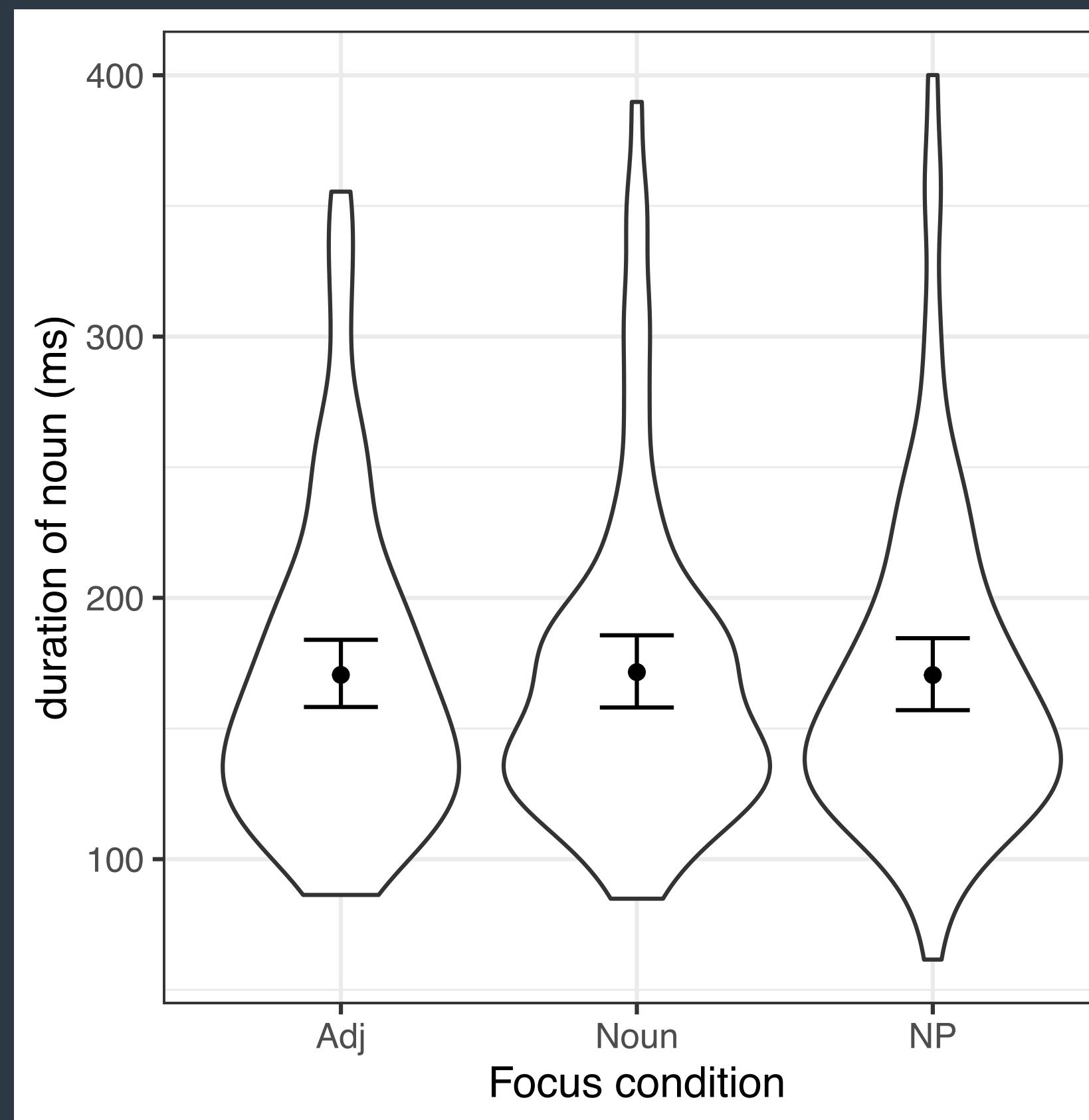
Focus condition was not a significant predictor of pitch accent type.



Logistic ME regression predicting unaccenting / PA type from focus condition, with random by-item and by-participant intercepts.

Results: Duration

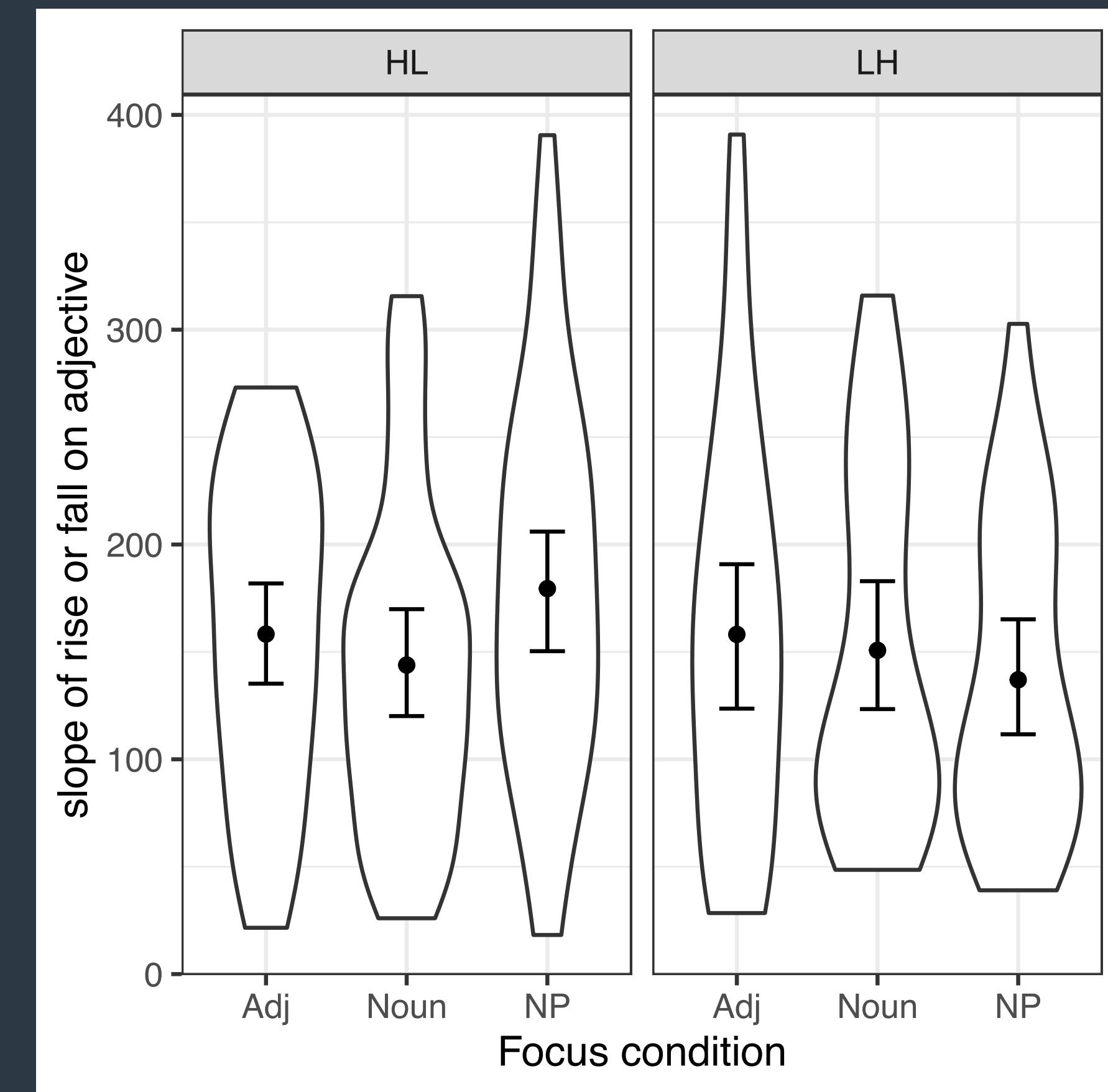
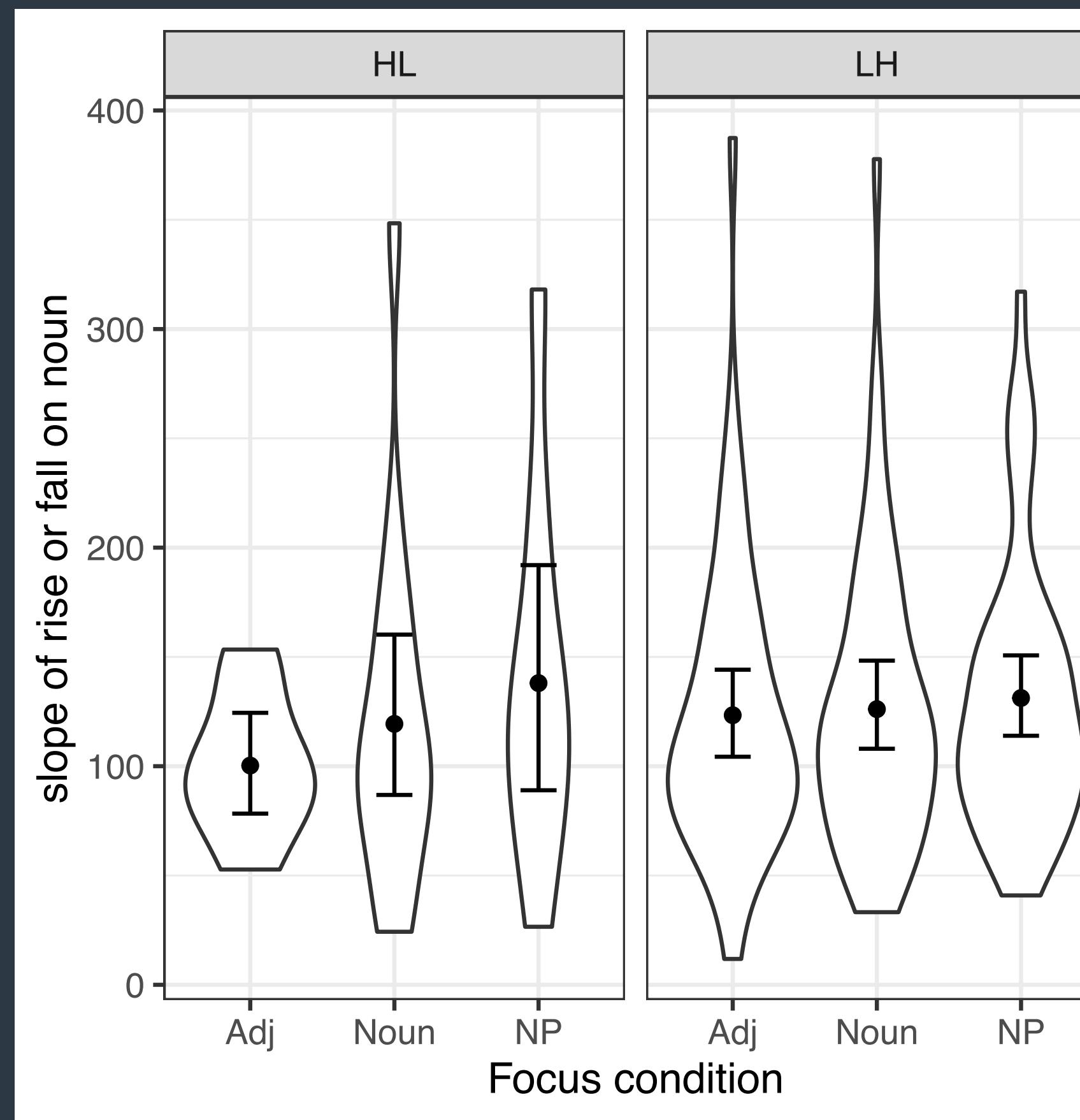
Neither noun nor adjective duration varied by focus condition.



Linear ME regression predicting duration from focus condition, with random by-item and by-participant intercepts.

Results: Slope of the rises

The slope of the rises (or falls) did not vary by focus condition for either expression.



Linear ME regression predicting slope from focus condition, with random by-item and by-participant intercepts.

Summary and discussion

Sensitive to focus condition?	Clopper & Tonhauser 2013 (IJAL)	Burdin et al 2015 (Lingua)	Turnbull et al 2015 (LCN)	this experiment
Deaccenting	X	yes	yes	yes
Pitch accent type	yes	X	yes	X
Duration	yes	yes	yes	X
Slope of rise	yes	not analyzed	X	X

- Focus condition was predictable from the visual context, so there was less pressure to communicate which expression was focused (Turnbull et al 2015).
- The task was not interactive (unlike that of Burdin et al 2015, Turnbull et al 2015), so participants may not have felt the need to convey focus meaning.

Comprehension experiment

Ko'āga a-guereko [jagua morot̄i]=nte.
now 1sg-have dog white=only
'Now I only have white dogs.'

Do Paraguayan Guaraní listeners interpret what =nte 'only' associates with in a complex noun phrase depending on prosodically marked focus?

Participants

- 24 self-identified speakers of Paraguayan Guaraní (bilingual in Spanish).
- Some also participated in the production experiment (about 1-2 weeks before).

Materials and procedure

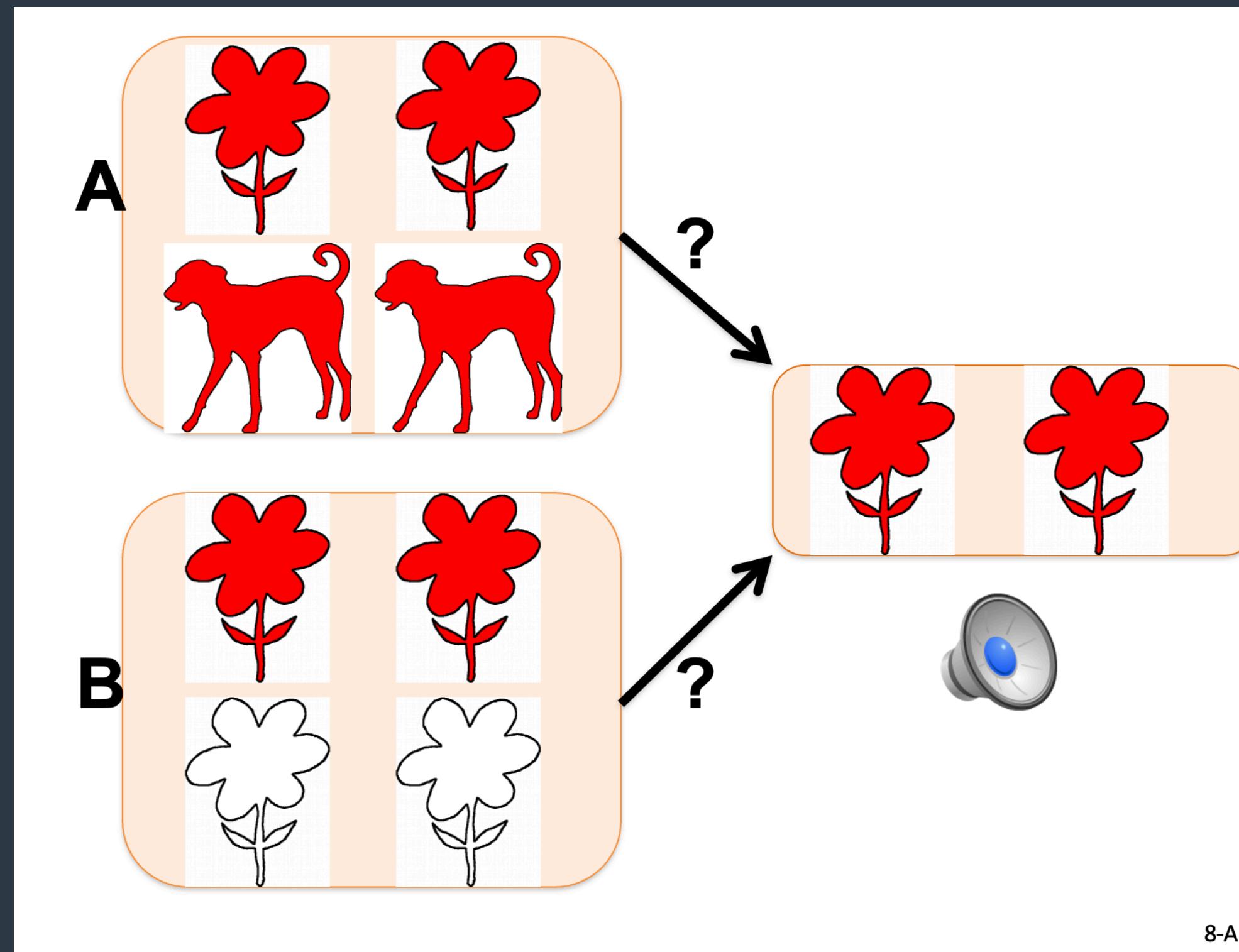
- 8 target sentences from the production experiment, 24 utterances total.

Ko'āga a-guereko [jagua morotī]=nte.
now 1sg-have dog white=only
'Now I only have white dogs.'

- I chose productions such that, for any given target sentence, the three utterances were produced by a single talker. (7 of the 10 talkers from the production experiment were represented.)
- Participants were seated in front of my laptop and shown a Powerpoint presentation.
- On each trial, participants were shown two visual displays, listened to a production, and had to select the visual display that best fit the production.

“The speaker either had red flowers and red dogs (A) or red flowers and white flowers (B).”

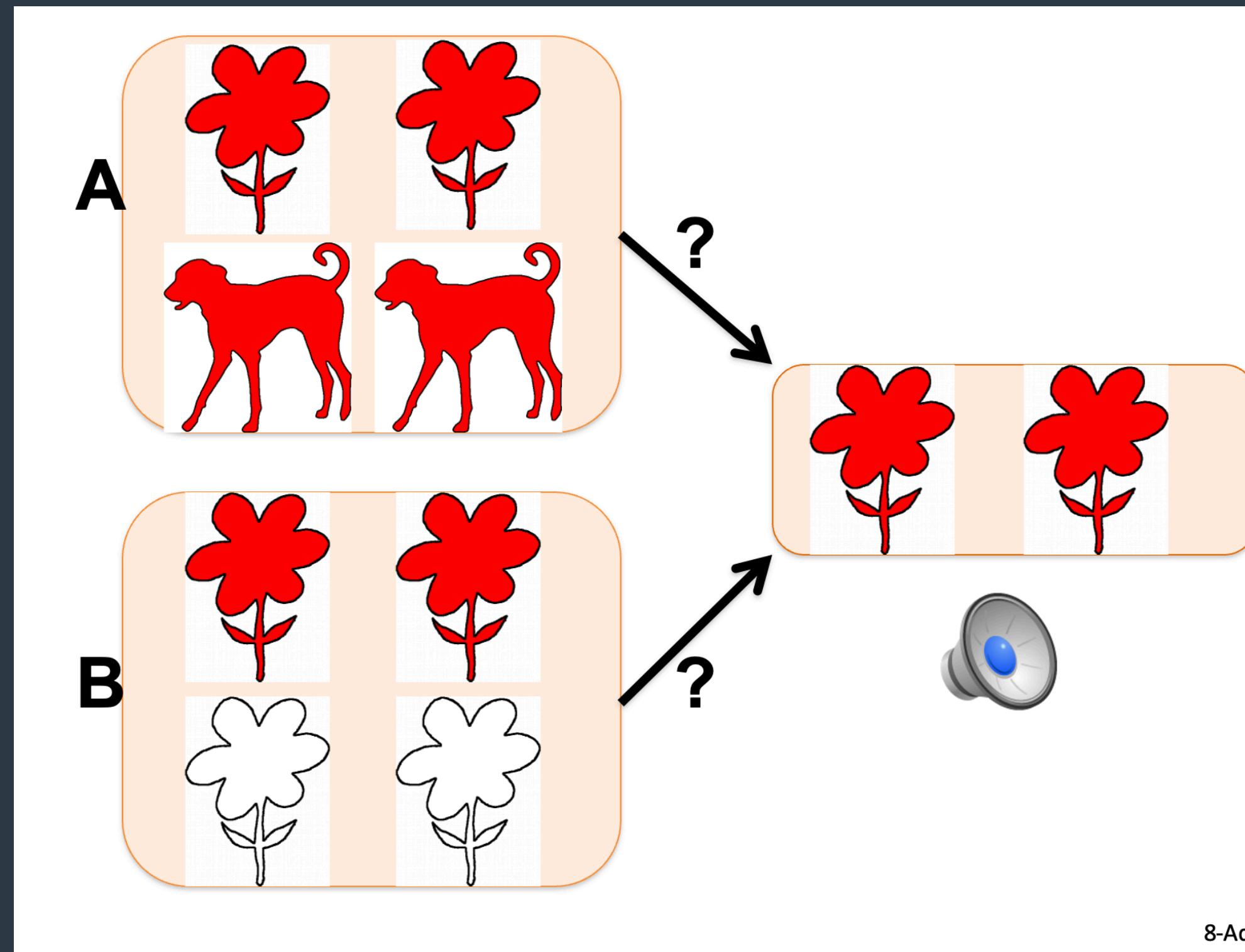
“The speaker is telling us what they now have.”



“Given what the speaker said, is it more likely that they had red flowers and red dogs (A) or red flowers and white flowers (B)?

Trial type #1: Adjective focus trial, with noun alternative

The alternative picture was always compatible with focus on the noun.

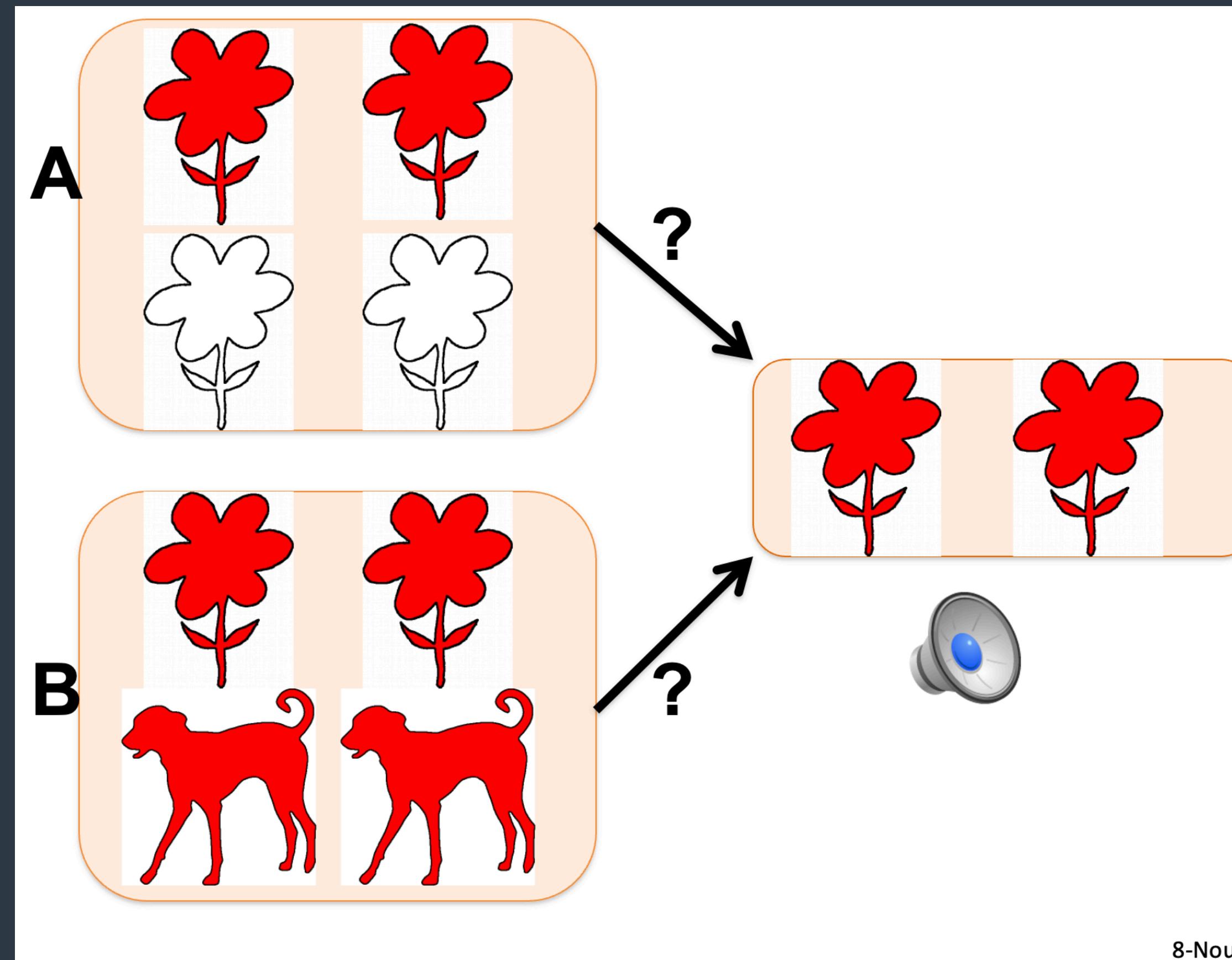


Ko'āga a-guereko [yvoty pytā]=nte.
now 1sg-have flower red=only
'Now I only have red flowers.'
(produced in adjective focus condition)

"Given what the speaker said, is it more likely that they had red flowers and red dogs (A) or red flowers and white flowers (B)"?

Trial type #2: Noun focus trial, with adjective alternative

The alternative picture was always compatible with focus on the adjective.



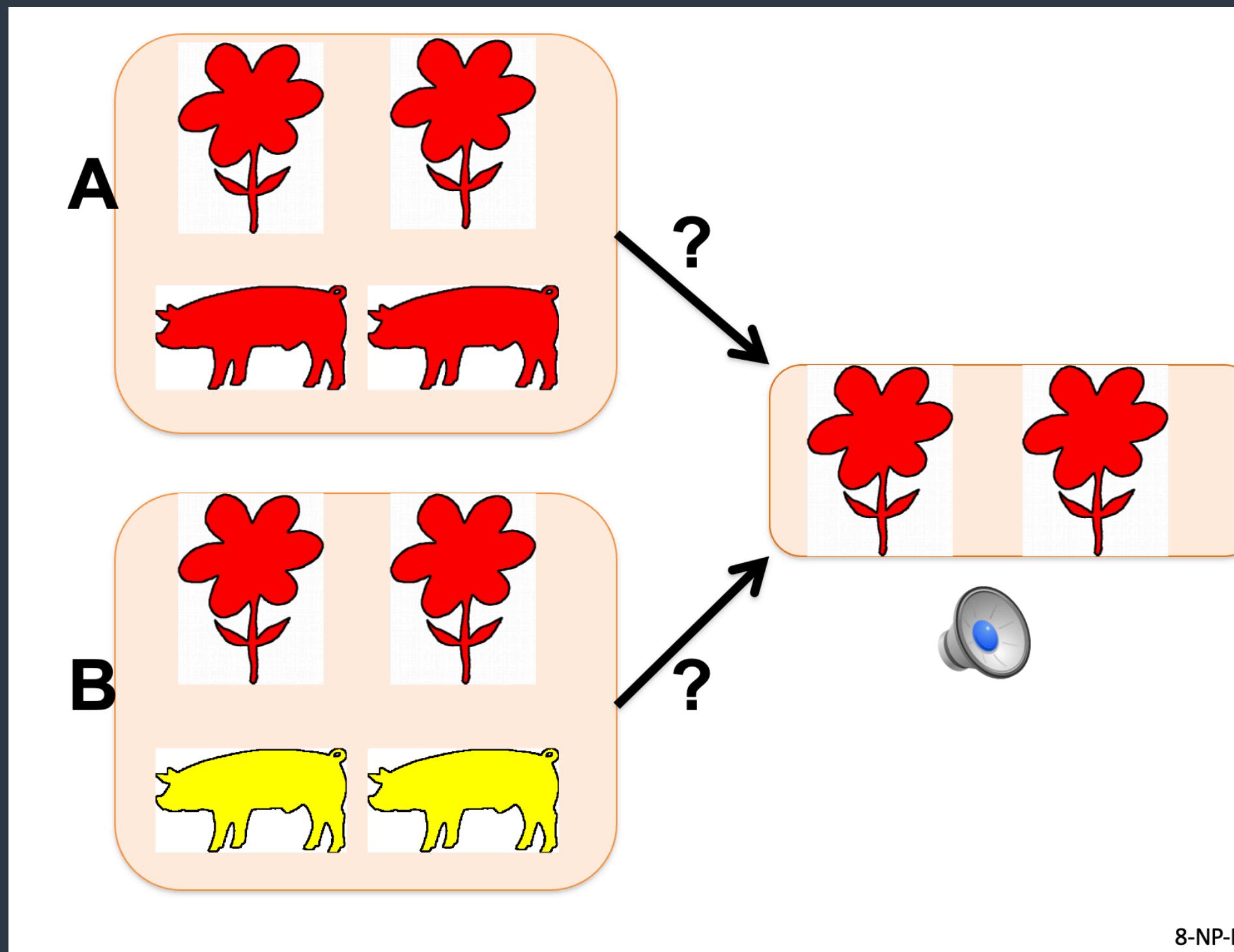
Ko'āga a-guereko [yvoty pytā]=nte.
now 1sg-have flower red=only
'Now I only have red flowers.'
(produced in noun focus condition)

"Given what the speaker said, is it more likely that they had red flowers and white flowers (A) or red flowers and red dogs (B)?"

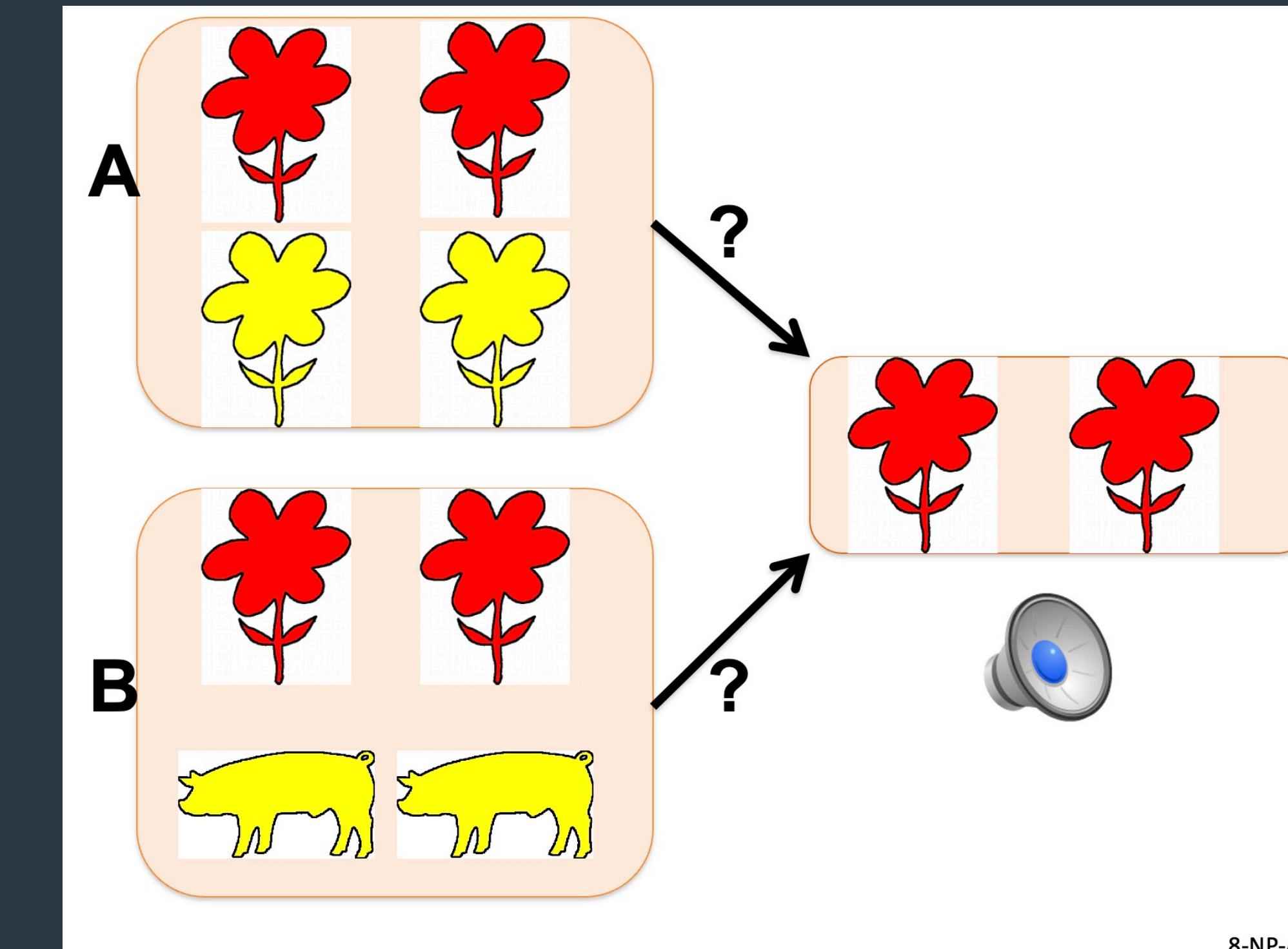
Trial types #3 and 4: NP focus trial

Alternative picture was compatible with:

noun focus



adjective focus



Ko'āga a-guereko [yvoty pytā]=nte.
now 1sg-have flower red=only
'Now I only have red flowers.'

(produced in NP
focus condition)

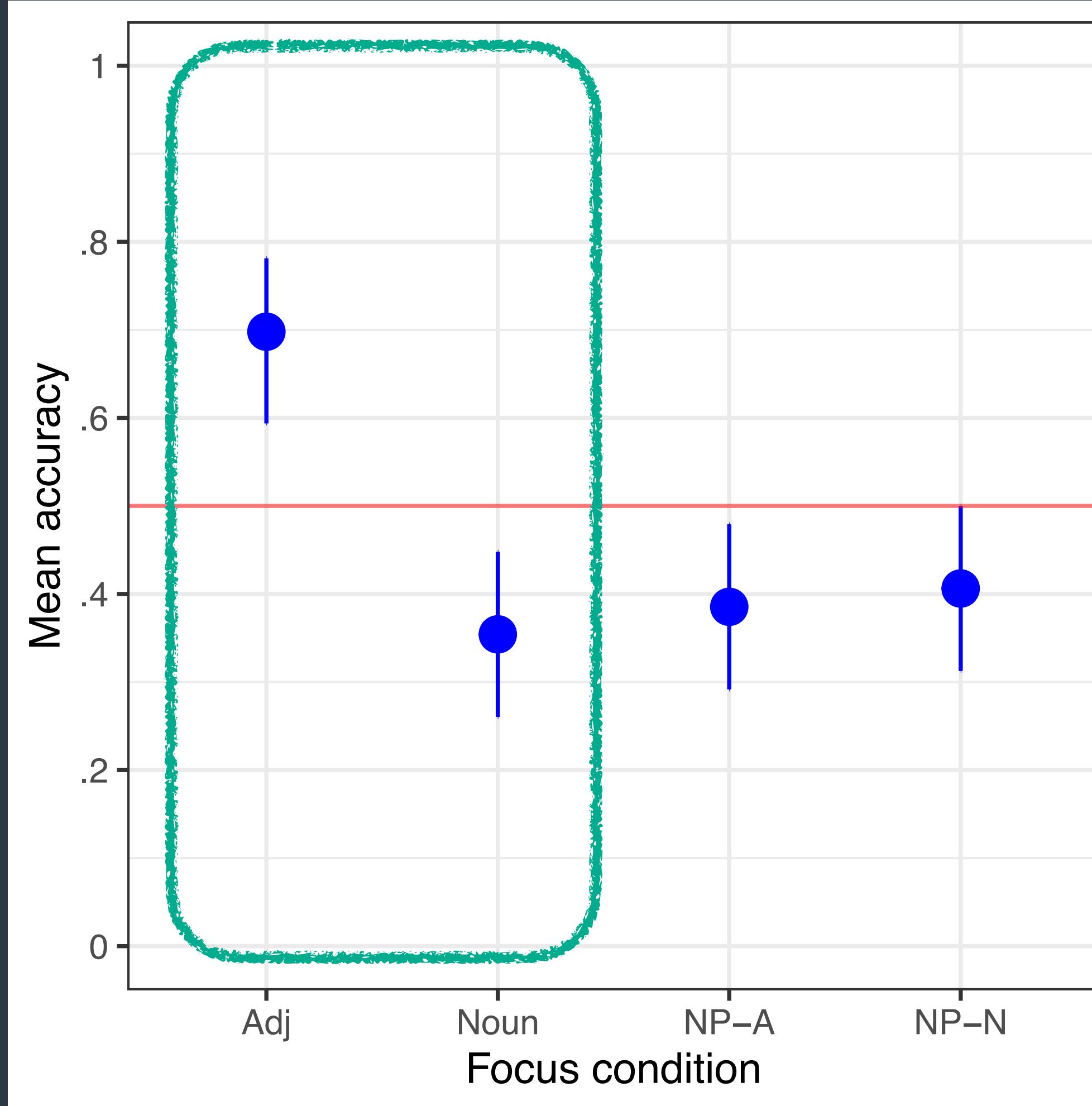
Materials and procedure

- 32 target trials in four conditions:
 - 8 Adjective focus (with noun focus alternative)
 - 8 Noun focus (with adjective focus alternative)
 - 8 NP focus (with adjective focus alternative)
 - 8 NP focus (with noun focus alterantive)
- Distributed across 2 lists so that every participant heard each of the 8 target sentences in two focus conditions (16 target trials).
- Target sentence, Condition and Focus Condition (of the original productions) were within-participant factors.
- The same 4 fillers at the start of each list, to familiarize participants to the task.

Materials and procedure

- Previous comprehension experiments (Clopper & Tonhauser 2013): below chance performance on randomly selected productions
- In selecting the target utterances, I tried to stack the cards in my favor. I favored triples in which:
 - Unaccented noun in adjective focus production
 - Duration of noun and adjective longer when in focus than when not in focus
 - LH pitch accent on noun in noun focus condition

Results

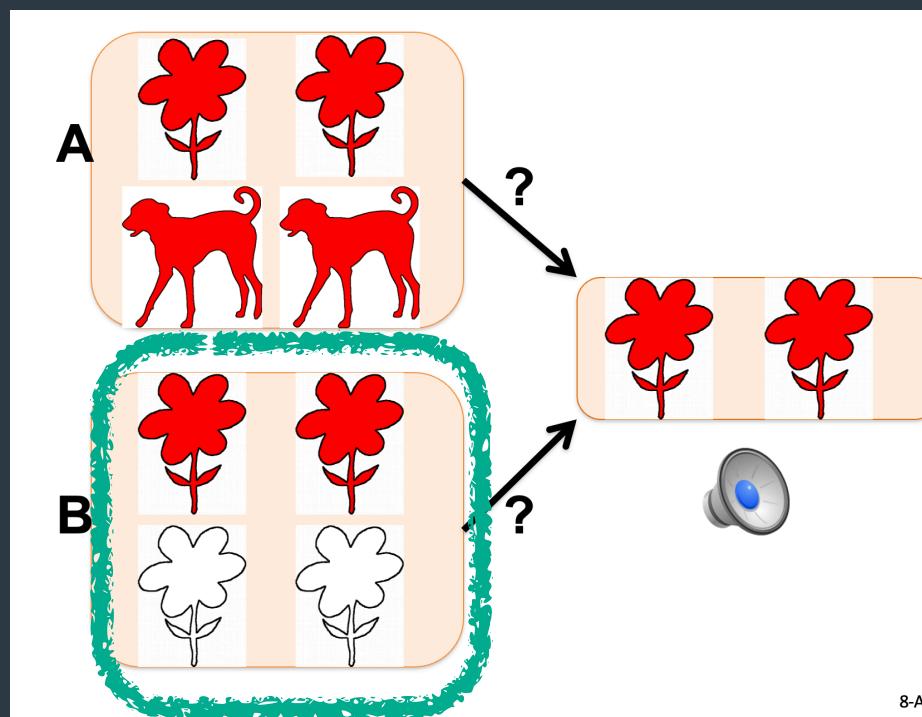


“How is it possible that participants are above chance at distinguishing adjective focus productions from noun focus, but below chance at distinguishing noun focus productions from adjective focus?”

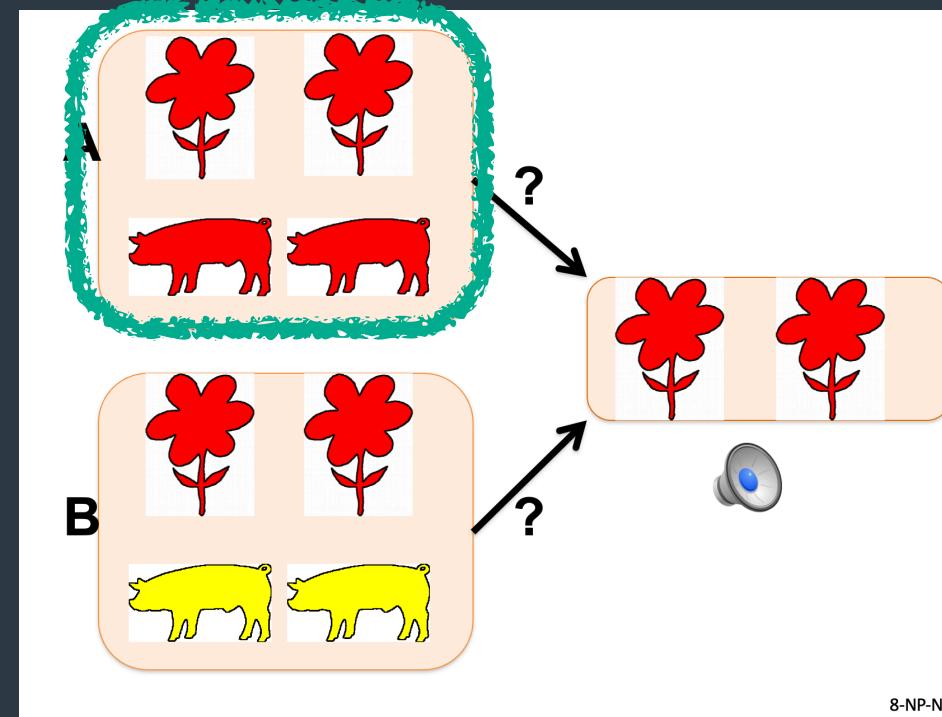
Results

Alternative response strategy: Choose the picture with the fewer contrasts,
shape > color.

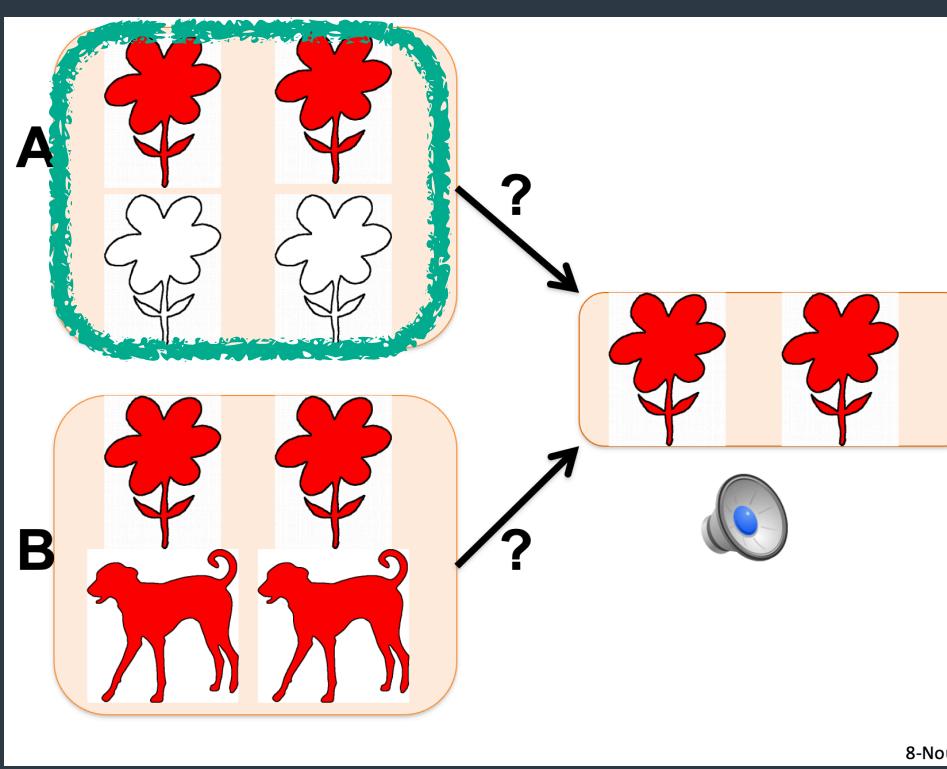
[adjective focus trials:
adjective focus picture]



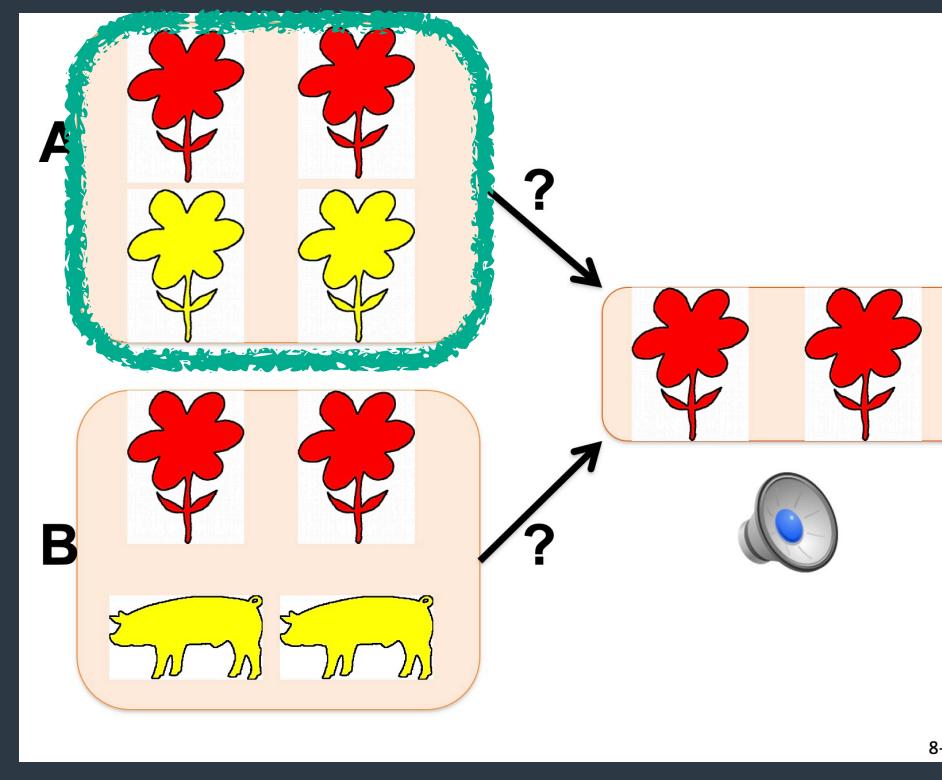
[NP-N focus trials:
noun focus picture]



[noun focus trials:
adjective focus picture]

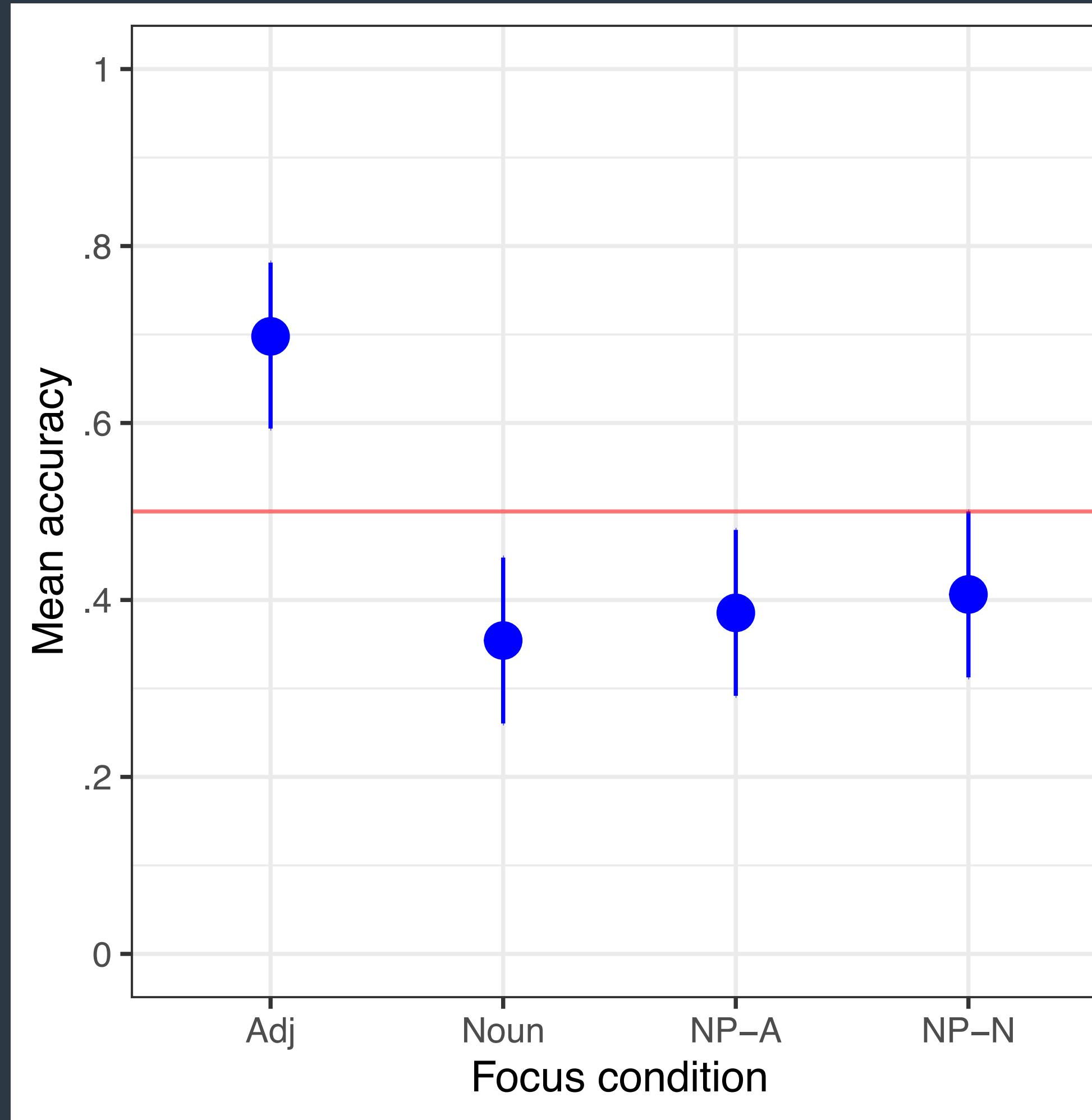


[NP-N focus trials:
adjective focus picture]

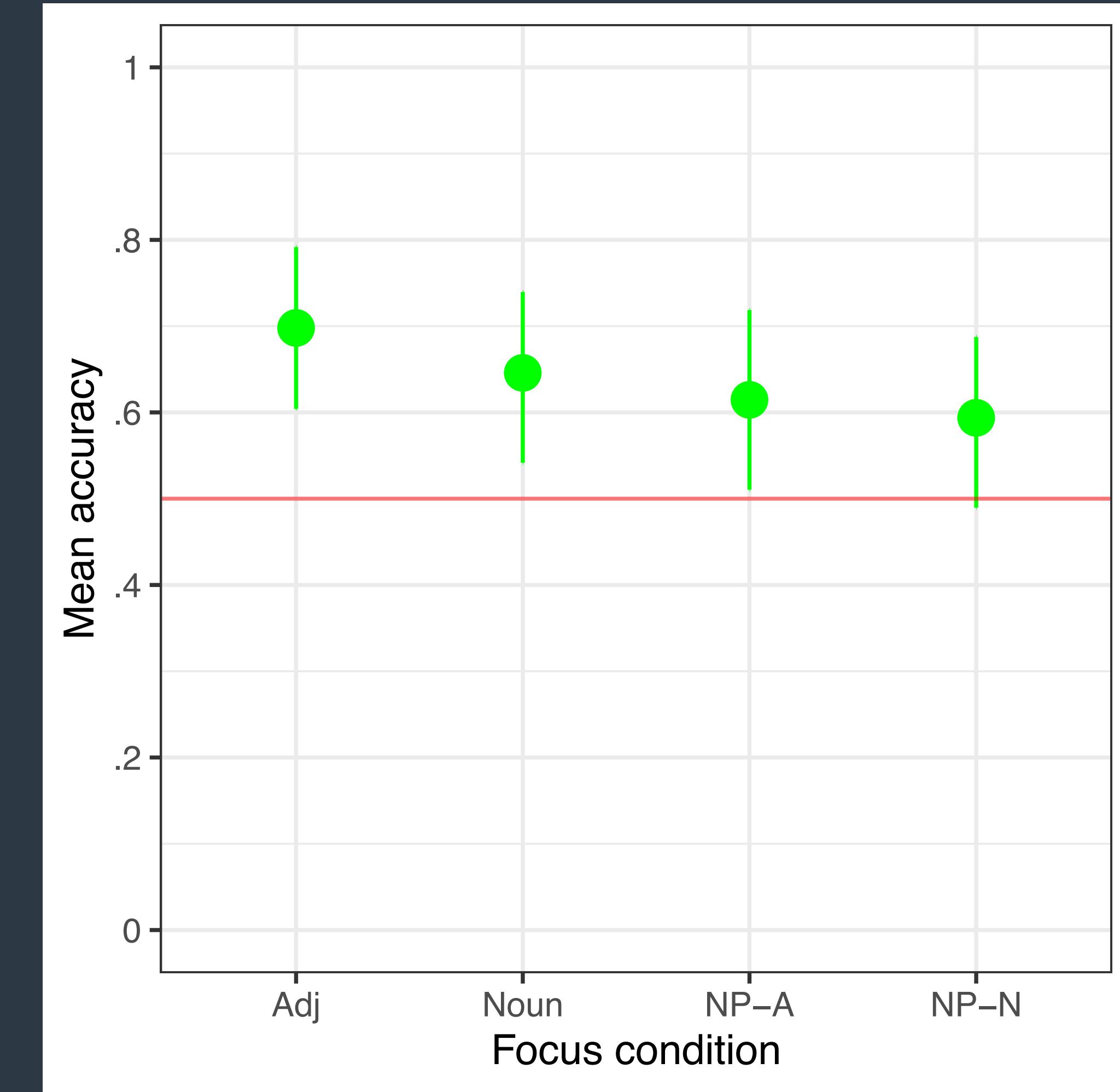


Results

accuracy by prosodic condition of production



accuracy by alternative response strategy



Summary and discussion

- The comprehension experiment did not provide evidence that Paraguayan Guaraní listeners attend to prosodic focus in identifying the associate of *=nte* ‘only’.
- This should not be taken as evidence that *=nte* ‘only’ is not sensitive to prosodically marked focus. Rather, it is likely that participants did not understand the task in the way it was intended.
- The experiment did not include control conditions that did not include the target sentences with *=nte* ‘only’ and could have been used to assess whether participants understood the task.

Is Paraguayan Guaraní *=nte* ‘only’ sensitive to prosodically marked focus when it cliticizes to complex noun phrases?

- Maybe?
- Production experiment: When *=nte* ‘only’ associates with the adjective, the noun is more likely to be unaccented than when *=nte* ‘only’ associates with the noun or NP.
- Comprehension experiment: ?

Larger lessons learned: (also based on other experiments)

- Balance the desire to elicit controlled utterances with the need for interactive tasks to elicit spontaneous, naturalistic utterances.
- Workshop experiment designs with lab mates and colleagues, to ensure that the task is easy to understand. Use controls to measure task understanding.
- Think through the entire analysis before running the experiment (ideally based on pilot data; preregistration can serve a double purpose!).

Additional slides

