



Yes/No, response particles are not trivial!
German and German Sign Language in the multimethodical
data lab and under the theoretical microscope

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Simple: *yes* and *no*



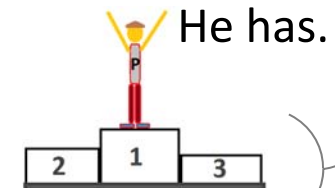
Pete has won the race.

Yes

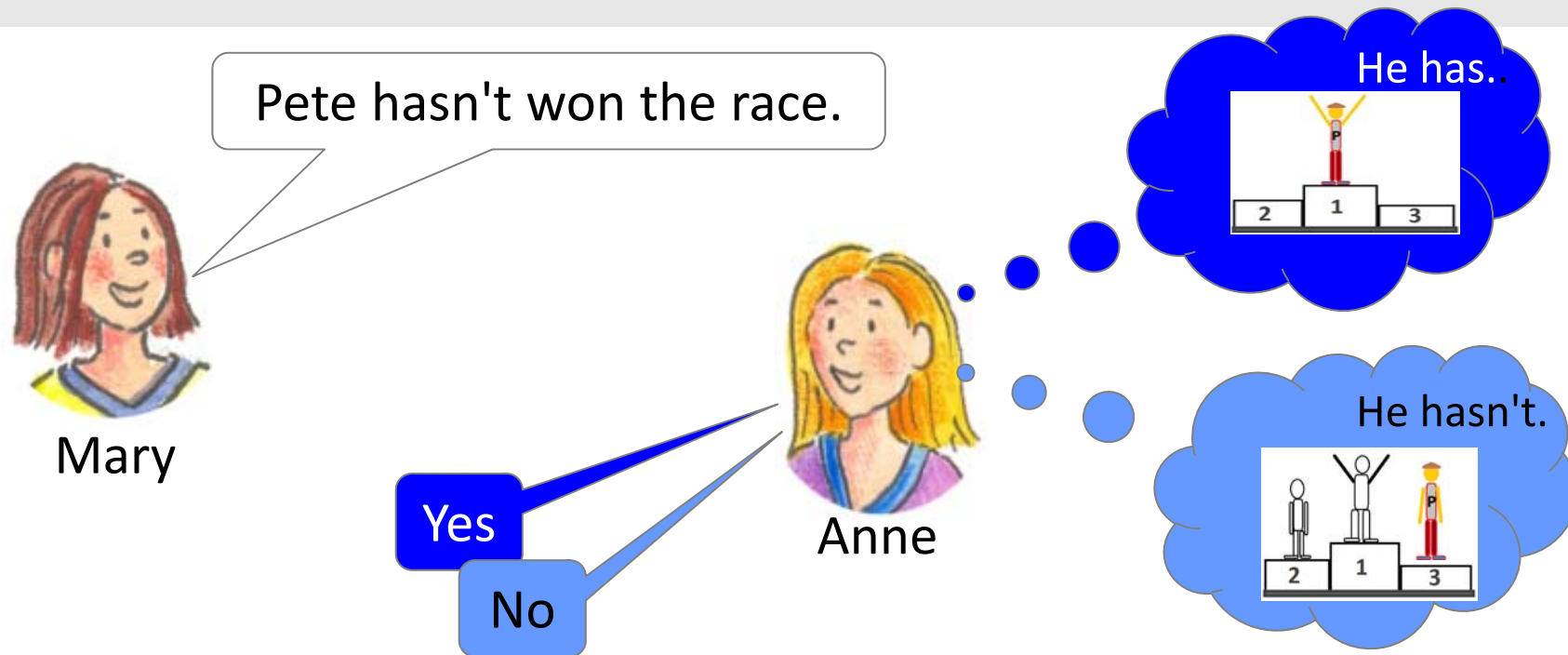
Anne

No

Anne



Not quite so simple *yes* and *no*



Indication of the **polarity** of response clause expressing the state-of-affairs

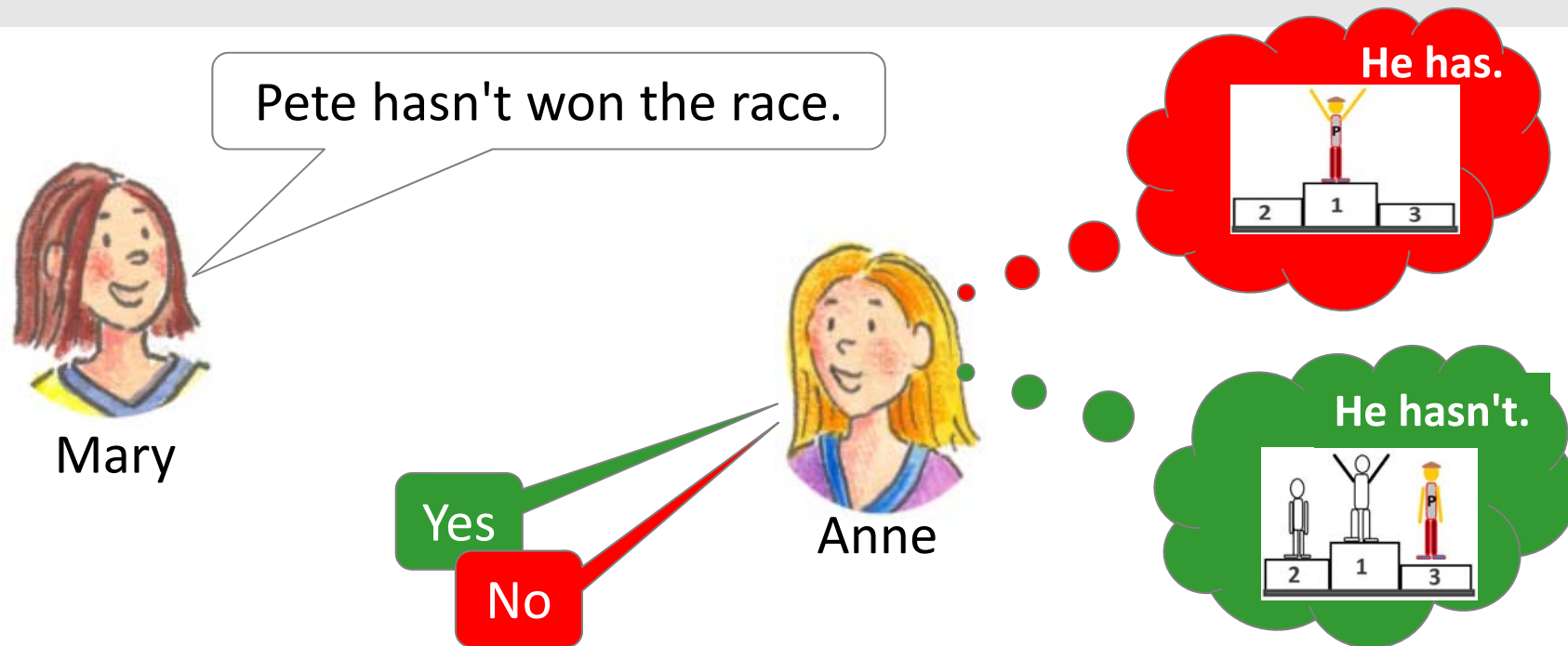
yes = Pete has won.

= positive polarity

no = Pete has not won.

= negative polarity

Not quite so simple *yes* and *no*



Indication of the **polarity** of response clause expressing the state-of-affairs

yes = *Pete has won.*

= positive polarity

no = *Pete has not won.*

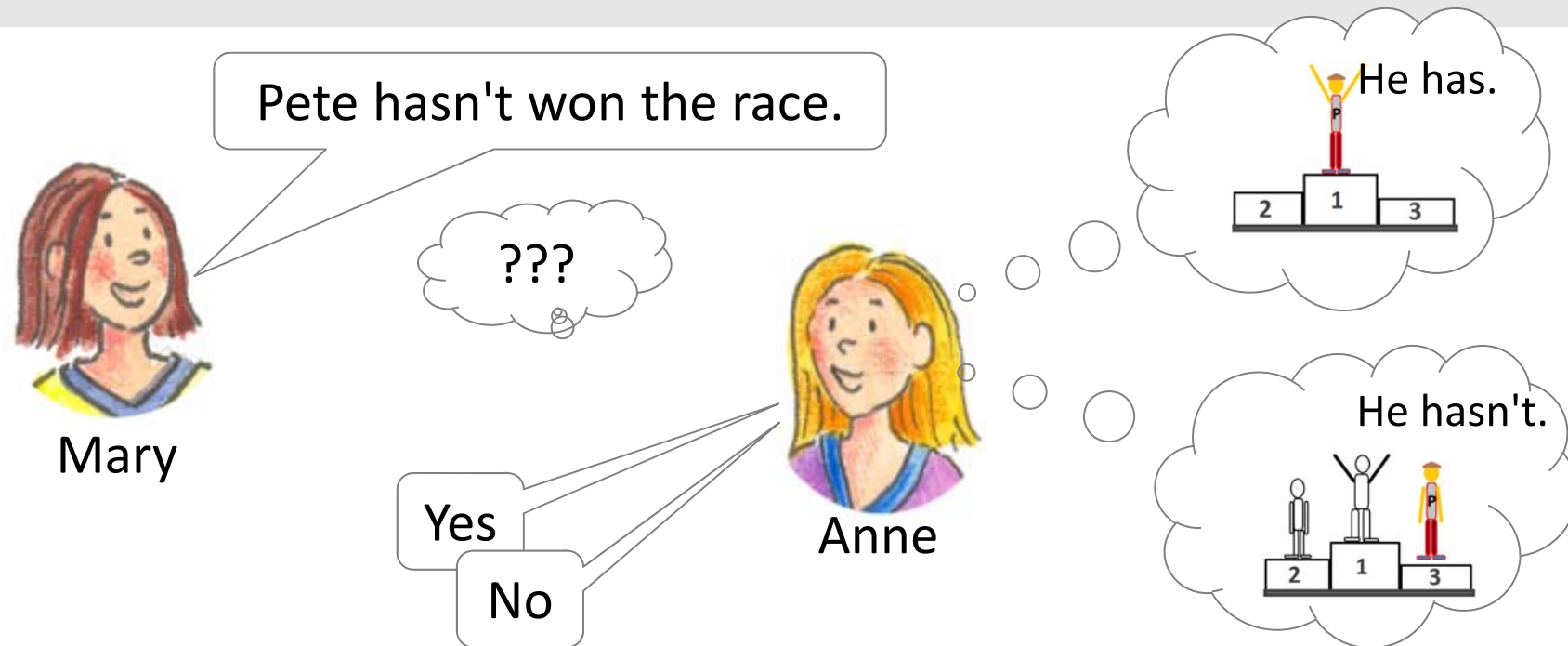
= negative polarity

AGREEMENT with vs. **REJECTION** of what the first speaker said (= **truth** of antecedent)

yes = I agree with what you said

no = I reject what you said

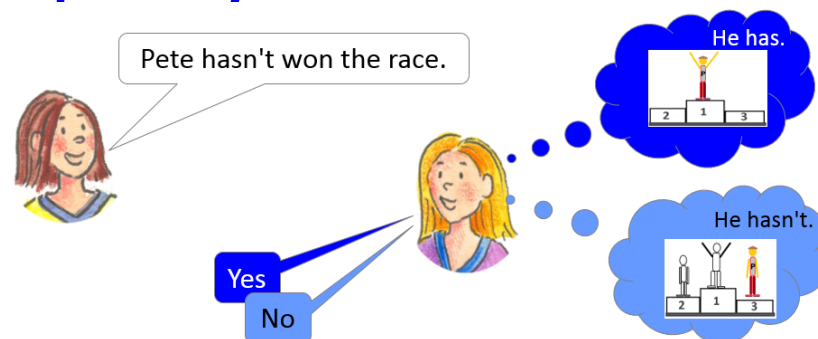
Not quite so simple *yes* and *no*



- When *yes* and *no* are used as responses to **negative** statements, their use stops being straightforward (Ginzburg & Sag 2000; Kramer & Rawlins 2011; Brasoveanu, Farkas & Roelofsen 2013, Krifka 2013, Roelofsen & Farkas 2015, Claus, Meijer, Repp & Krifka 2017, Goodhue & Wagner 2018).

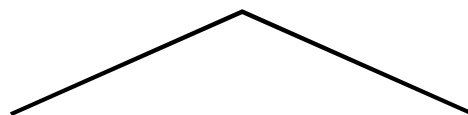
Answering systems

- Pope (1976): **Cross-linguistically**, there are two major answering systems:
 - *polarity-based systems*
 - ↳ response particles indicate the polarity of the response clause
 - *truth-based systems*
 - ↳ response particles indicate the truth or falsity of the antecedent
- Pope (1976), Jones (1999): **English is polarity-based**



This picture has turned out to be too simplistic.

Theories of *yes* and *no* in English



Meaning of *yes/no* is derived at the **semantics-pragmatics interface**.

Response particles are **propositional anaphors / anaphoric operators** that pick up a proposition that was introduced by the antecedent clause (Krifka 2013; Roelofsen & Farkas 2015)

When used in responses to assertions, response particles may be **rejoinders** like *true/right* –(Holmberg 2015)

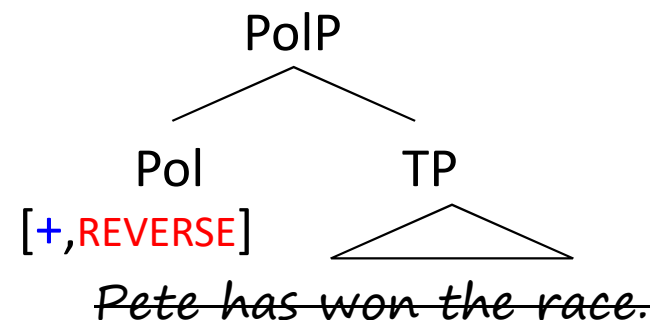
Meaning of *yes/no* is derived in the **syntax**.

Response particles are the remnant of an **elliptic clause**, which is elided under identity with the antecedent. The identity with the antecedent is mitigated via interpretable vs. uninterpretable syntactic features. (Kramer & Rawlins 2011; Holmberg 2013, 2015)

Roelofsen & Farkas (2015): The feature model



Pete hasn't won the race.

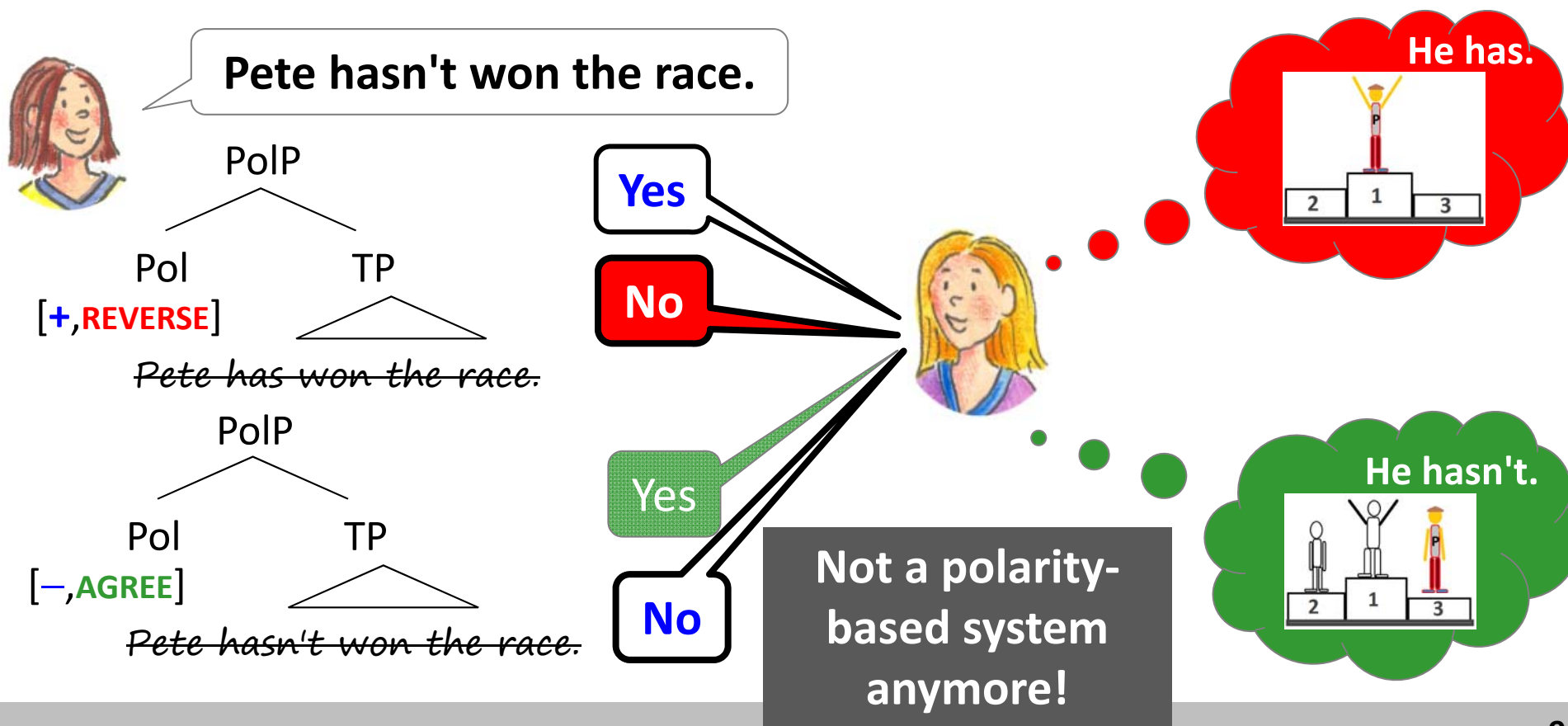


The Pol head has **semantic polarity features** that are presuppositional.

- **absolute features** presuppose that the polarity of the response clause is
 - [+] positive
 - [-] negative
- **relative features** presuppose that the polarity of the antecedent and the elided response clause is
 - [AGREE] the same
 - [REVERSE] different
- The features map onto response particles.
 - English: [+] and [AGREE] → *yes* [-] and [REVERSE] → *no*
 - German: [+] and [AGREE] → *ja* [-] and [REVERSE] → *nein*
[+, REVERSE] → *doch* (blocks the other particles)

Roelofsen & Farkas (2015): The feature model

- [-] is a marked feature: sentences with negation are harder to process
- [REVERSE] is a marked feature: disagreeing is dispreferred in conversation
- [+] is marked if combined with [REVERSE] – not a natural class
- Marked features have higher realization needs, i.e. need to be expressed



Claims and predictions by the different theoretical accounts



Pete hasn't won
the race.

Empirically,
this is a
pretty
messy
picture.

Semantic-pragmatic theories

Roelofsen & Farkas (2015) – feature model

- affirmations: *No, he hasn't. > Yes, he hasn't.*
- rejections: *No, he has. = Yes, he has.*

Krifka (2013) – saliency account (default contexts)

- affirmations: *No, he hasn't. > Yes, he hasn't.*
- rejections: *Yes, he has. > No, he has.*

The ellipsis theories

Kramer & Rawlins (2009)

- affirmations: *No, he hasn't. = Yes, he hasn't.*
- rejections: *No, he has. = Yes, he has.*

Holmberg (2015)

- affirmations: *No, he hasn't. / %Yes.*
- rejections: *Yes, he has.*

Quantifying the mess: Previous experimental evidence

For responses to assertions

- **US English** (Brasoveanu, Farkas & Roelofsen 2013): acceptability study

Affirmations: No, he hasn't > Yes, he hasn't

- **German** (Claus, Meijer, Repp, Krifka 2017): acceptability study
 - ↳ great inter-individual variation in affirmations but not in rejections (responses with and without response clause were tested)

Affirmations: ja > nein (majority of speakers); *nein >/= ja* (minority)

Rejections: doch > nein > ja

- **Mandarin Chinese** (Li, González-Fuente, Prieto, Espinal 2016): production study (prosody, gesture were analyzed):

Rejections: (No₁/No₂) + positive sentence

- prosody: without particle → higher mean pitch than in non-rejections
- gestures: more head nods/ head shakes than in non-rejections

Our cross-linguistic pragmatics project

Quantitative investigation

- of acceptability, interpretation, written and oral production
- of responses to assertions and questions
- in German, English, Dutch, Swedish, German Sign Language

Today

- Old findings from **acceptability judgement experiments** for English (UK), Dutch (The Netherlands) and German (Germany) (Claus, Meijer, Repp & Krifka 2017; Repp, Meijer & Scherf to appear) Dutch
 - ↳ partly unexpected results; great inter-individual variability
- Exploration of unexpected results and variability with different methods: written production, interpretation; new findings from an **oral production experiment** on **German** (Germany) with a glimpse at **Dutch**
- Extending the cross-linguistics database: New findings from a **production experiment** on **German Sign Language** (Germany)

Three-particle languages

Dutch and German have a third particle for rejections.

Third particles may realize one or two features.

- German: *ja* [AGREE], [+] *nein* [REVERSE], [-] *doch* [REVERSE, +]
- French: *oui* [+] *non* [-] *si* [REVERSE, +]
- Romanian: *da* [+] *nu* [-] *ba* [REVERSE]
- Hungarian: *igen* [+] *nem* [-] *de* [REVERSE]
(Roelofsen & Farkas 2015)

- Dutch: *ja* [+] *nee* [-] *jawel* [REVERSE, +]
on the basis of Hoeksema (2006)

- Swedish: *ja* [+] *nej* [-] *jo* [REVERSE, +]
on the basis of Holmberg (2013, 2015)

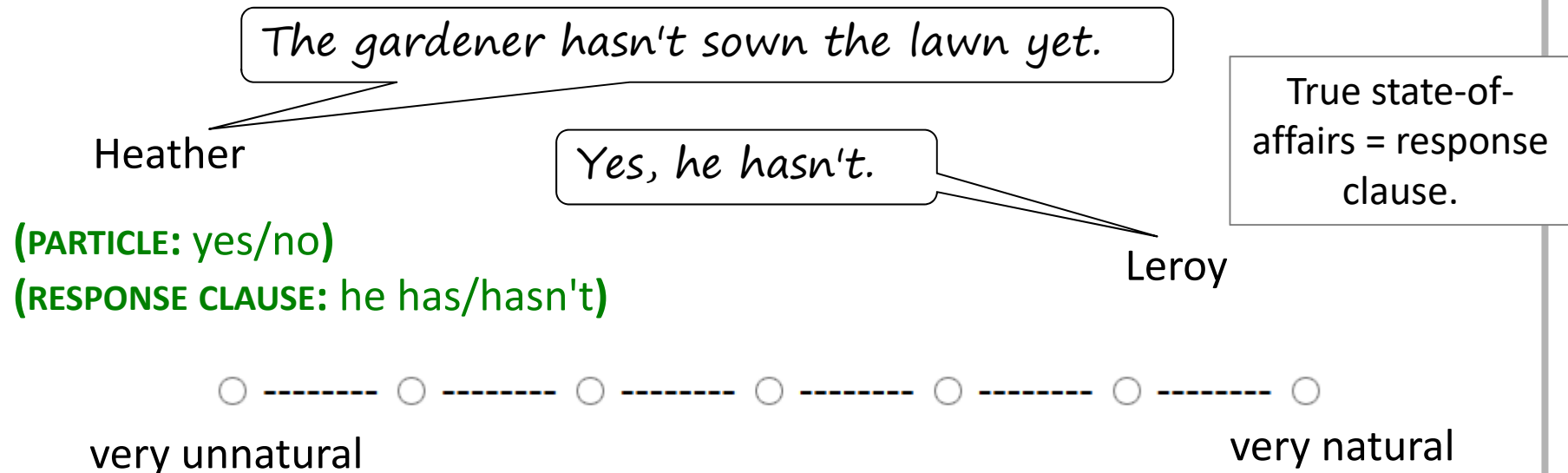
For **German Sign Language (DGS)**, we do not know!

Acceptability studies (Claus et al. 2017, Repp et al. to appear)

Design: $2 \times 2 \times 2$ – **three factors, two levels each**

A couple of weeks ago Heather and Leroy asked their gardener to redo the back garden of their holiday home.

(CONTEXT) Now they are reviewing what the gardener has done already.
Now they are reviewing what the gardener hasn't done yet.



CONTEXT tested a context prediction made by Krifka (2013). There were no relevant context effects so I will ignore the factor in what follows.

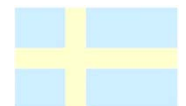
Acceptability studies (Claus et al. 2017, Repp et al. to appear)

Materials: 48 items in 8 conditions; 16 fillers

- UK English (*yes, no*)
- Netherlands Dutch (*ja, nee*)
- Sweden Swedish (*ja, nej*)
- German (*ja, nein*)

Participants

- 48 UK English speakers; recruited via *Prolific Academic* (web study)
- 48 Dutch speakers from the Netherlands (*Prolific Academic*)
- 32 Swedish speakers from Sweden (*Prolific Academic*)
- 48 Standard German speakers (lab sessions in groups)





Responses to assertions - English

CLMMs: Interaction response clause × particle ($b = 3.5, se = .2, z = 19.4, p < .001$)

Affirmations: *no* > *yes*

($b = -4.4, se = .3, z = -14.4, p < .001$)

Rejections: *yes* > *no*

($b = 2.5, se = .3, z = 8.9, p < .001$)

Affirmations: Predictions of all theories except K&R are met.

Rejections: Only predictions of Krifka (2013) are met – in part.

English overall seems to be **polarity-based**.

Issues: [1] *No, he has.*

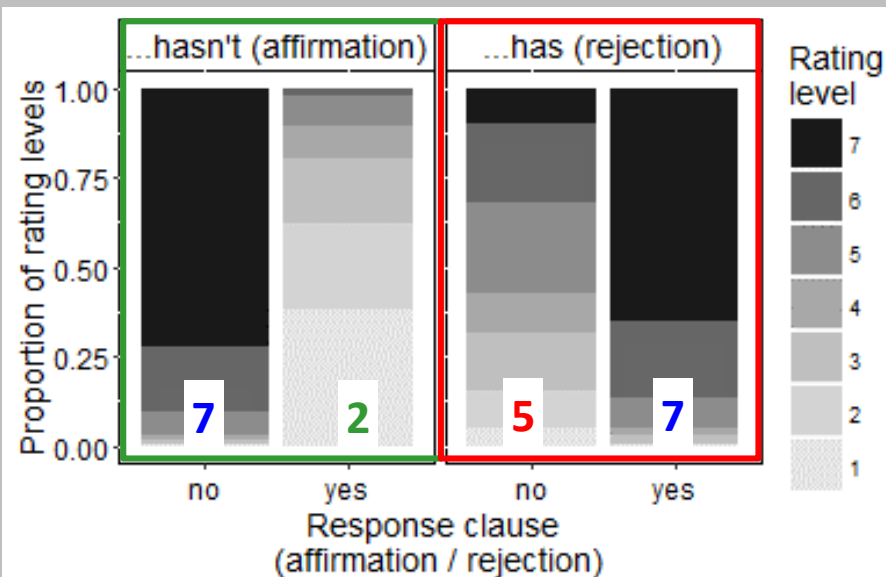
⇒ Ratings quite high

[2] *Yes, he hasn't*

⇒ Ratings as low as with positive antecedents?

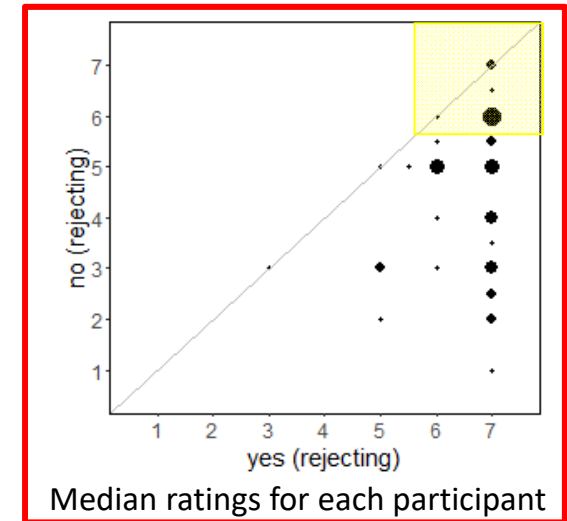
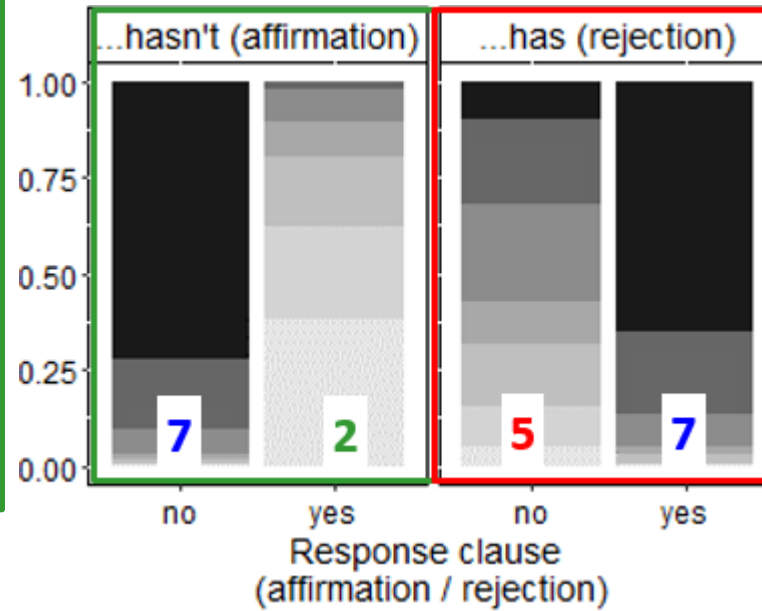
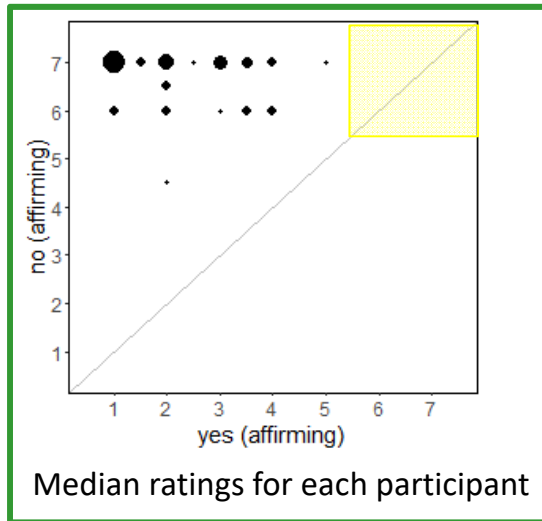
The gardener hasn't sown the lawn yet.

No/Yes, he ...





Issues: Fairly high ratings for *No*, *he has*.



Number of participants

- 1
- ◆ 2
- ◆ 3-4
- 5-6
- 7-9
- 12-14
- >14

Individual variation: For 25% of the speakers ($n = 13$) *no* is acceptable as a **rejecting particle**.

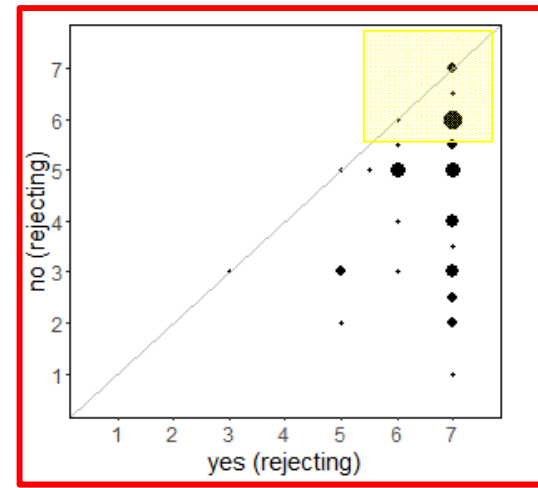
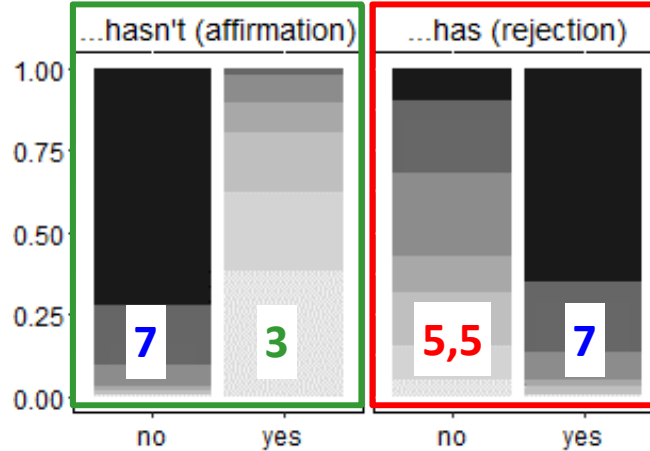
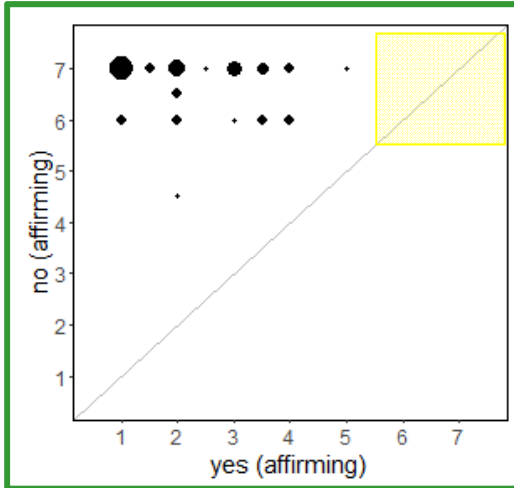
Some but a little less individual variation: *yes* is much less acceptable in affirmations → *yes* indicates **positive polarity** of response “more obligatorily”



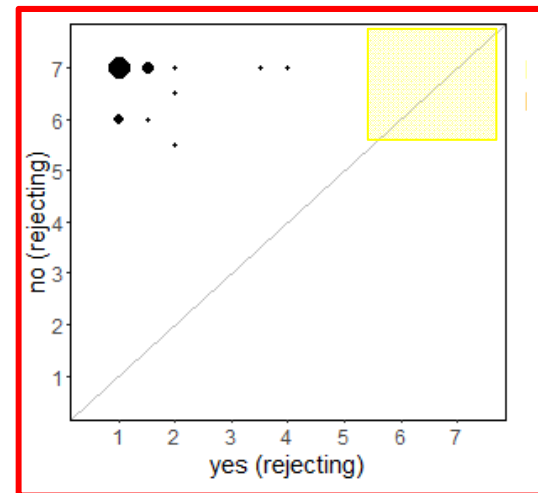
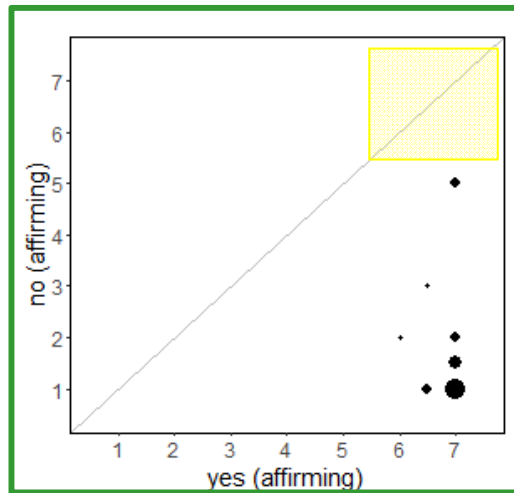
Issues: Positive vs. negative antecedents

The gardener hasn't sown the lawn yet.

Data from follow-up experiment



The gardener has already sown the lawn.



Knowledge + Response clause
(affirmation / rejection)

Theoretical evaluation

- The results pose problems for all theories of English response particles.
- From our current perspective and for the current purpose, an adaptation of the semantic-pragmatic feature model (Roelofsen & Farkas 2015) is most promising.
- The feature model was refined in a recent manuscript by Farkas & Roelofsen (2018) in reaction to the discussion of findings for German in Claus et al. (2017):
 - Specification of additional constraints and constraint interaction
 - (Stochastic) optimality-theoretic perspective

Theoretical evaluation

Farkas & Roelofsen (2015/2018):

- General constraints
 - REALIZE MARKED FEATURES (see above)
 - AVOID AMBIGUITY: Avoid expressions that are perniciously ambiguous
- Language-specific constraints, e.g.
 - REALIZE RELATIVE FEATURES ([AGREE] / [REVERSE])
 - REALIZE ABSOLUTE FEATURES ([+] [−])
 - ...
- Blocking constraints
 - EXPRESSIVENESS: Express meaning (feature content) – Prefer the use of expressions that express more features over alternative expressions
 - FREQUENCY: Prefer the use of frequent forms.



An account for English (feature model)

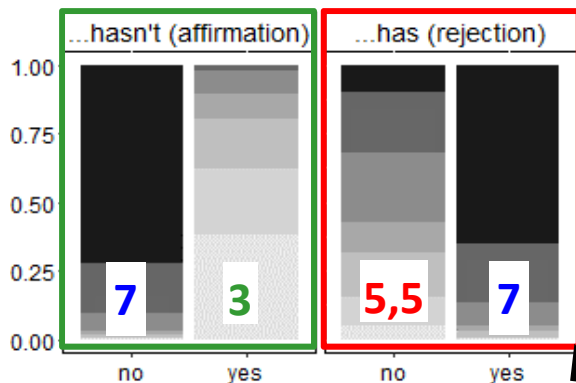
The gardener hasn't sown the lawn yet.

[AGREE, -]

[AGREE] → *yes*

[-] → *no*

no > *yes*



[REVERSE, +]

[REVERSE] → *no*

[+] → *yes*

yes > *no*

[REVERSE], [-] → *no*; [AGREE], [+] → *yes*

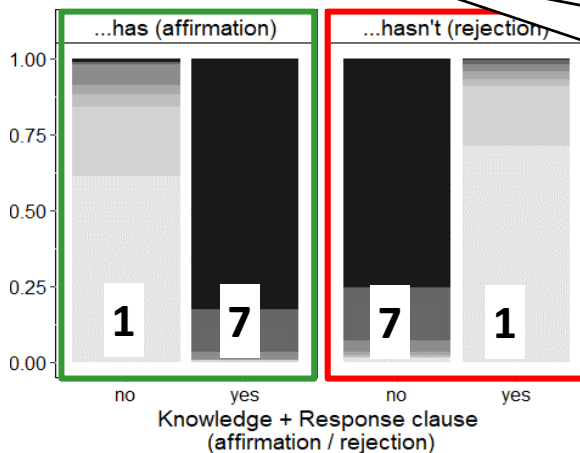
no [REVERSE] is fairly acceptable, *yes* [REVERSE, +] is boosted

REALIZE ABSOLUTE FEATURES >> REALIZE MARKED FEATURES

[AGREE, +]

[AGREE] → *yes*

[+] → *yes*



For 25% speakers *no* [REVERSE] fully acceptable → no ranking? Prosodic /gestural factors?

[REVERSE, -]

[REVERSE] → *no*

[-] → *no*

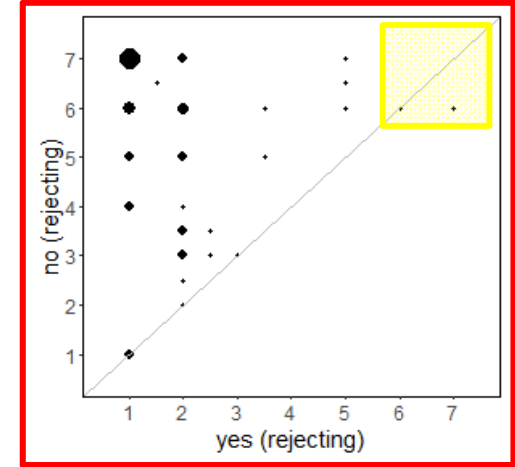
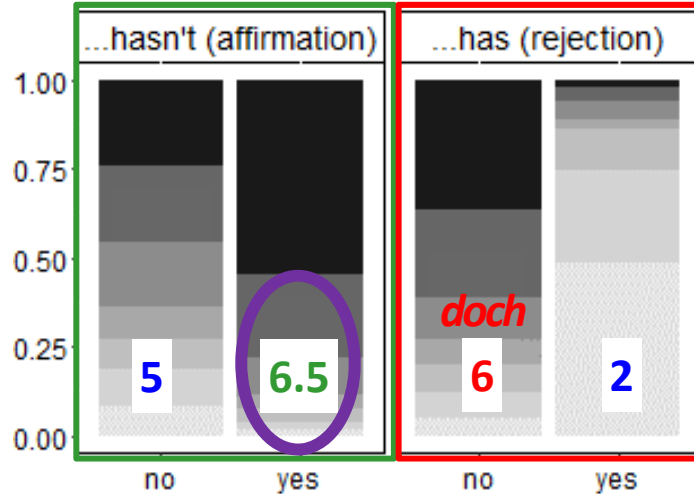
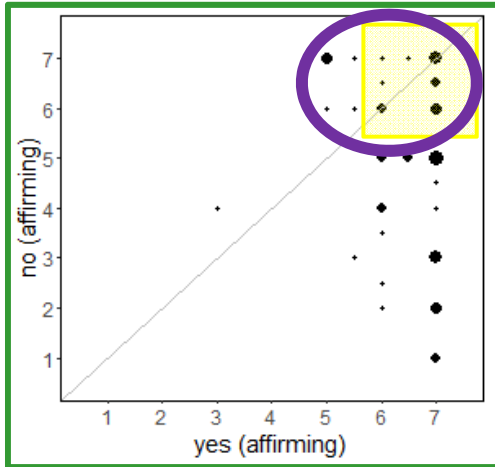
The gardener has already sown the lawn.



Responses to statements – German

The gardener hasn't sown the lawn yet.

Ja/Nein, he...



[AGREE, -]

ja > *nein* (majority)

[REVERSE, +]

nein > *ja*

doch is best (tested)

blocking effect for *nein* not strong?

For some speakers opposite/equal ranking

nein [REVERSE] acceptable

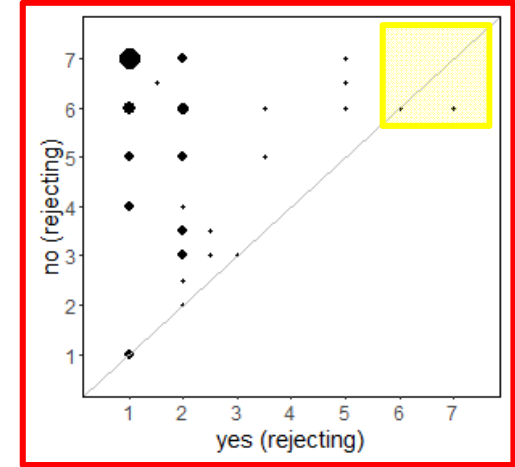
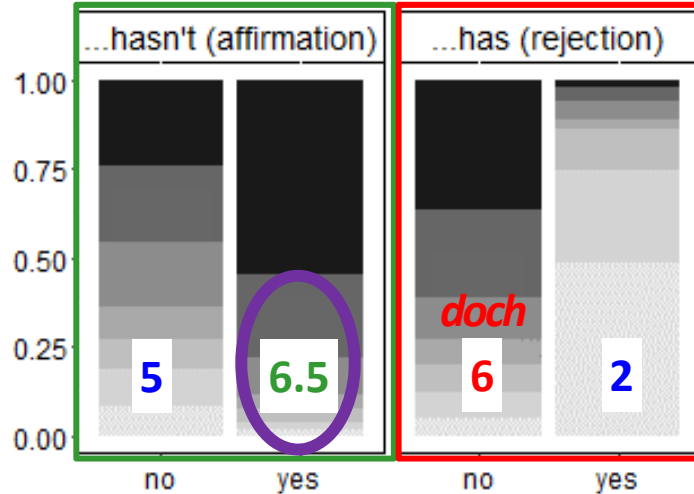
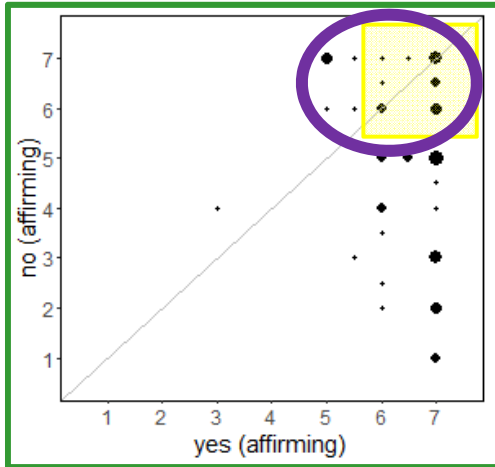
EXPRESSIVENESS >> REALIZE **RELATIVE** FEATURES >> REALIZE MARKED FEATURES



Responses to statements – German

The gardener hasn't sown the lawn yet.

Ja/Nein, he...



[AGREE, -]

ja > nein (majority)

[REVERSE, +]

nein > ja

[REVERSE], [-] → nein; [AGREE], [+] → ja

majority
pattern

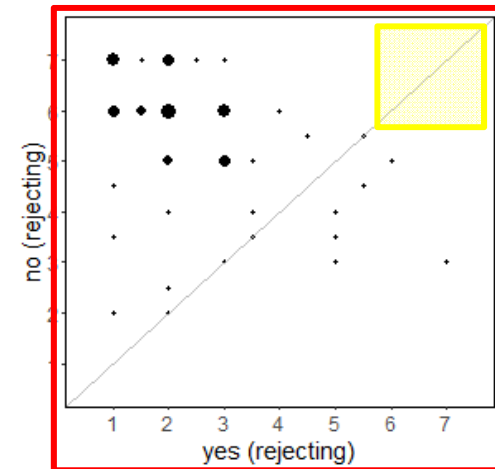
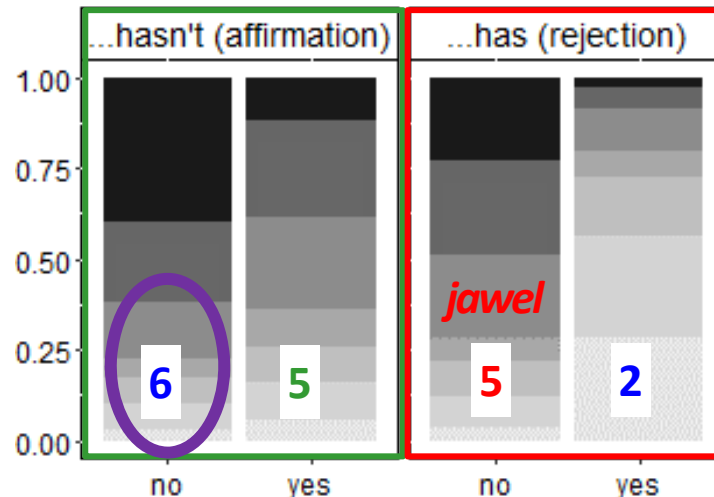
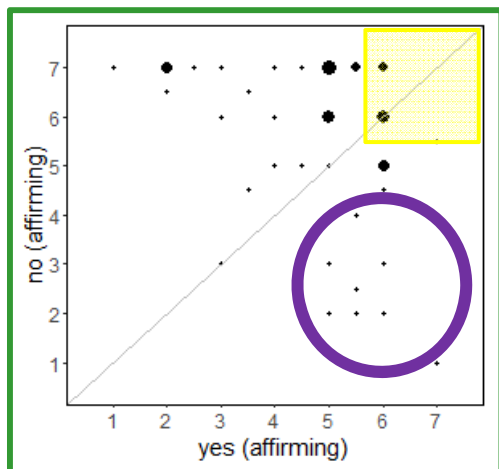
EXPRESSIVENESS >> REALIZE RELATIVE FEATURES >> REALIZE MARKED FEATURES



Responses to assertions - Dutch

The gardener hasn't sown the lawn yet.

Ja/Nee, he...



[AGREE, -]

[AGREE] → *ja*, [-] → *nee*

nee > *ja* (majority of speakers)

[REVERSE, +]

[REVERSE] → *nee*, [+] → *ja*

nee > *ja*

jawel is arguably best (not yet tested)

For some speakers equal ranking?

For some speakers opposite/equal ranking?

ja [AGREE] is fairly acceptable

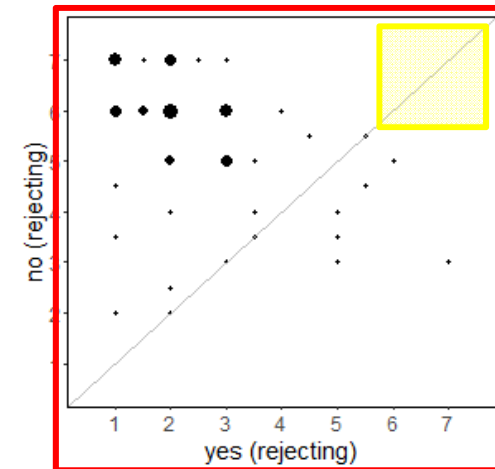
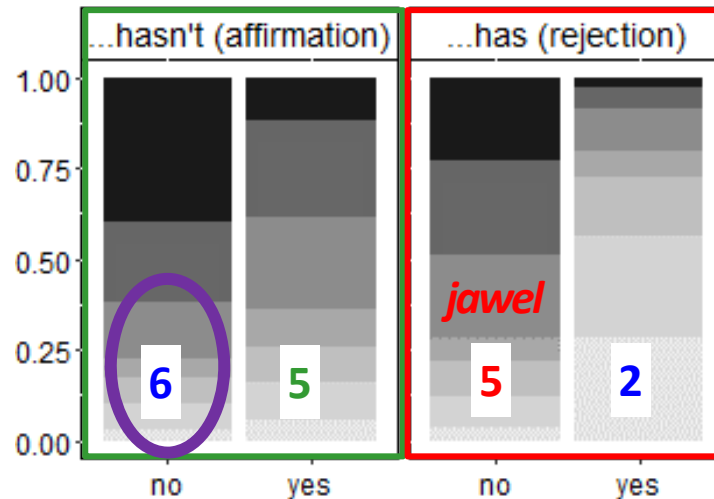
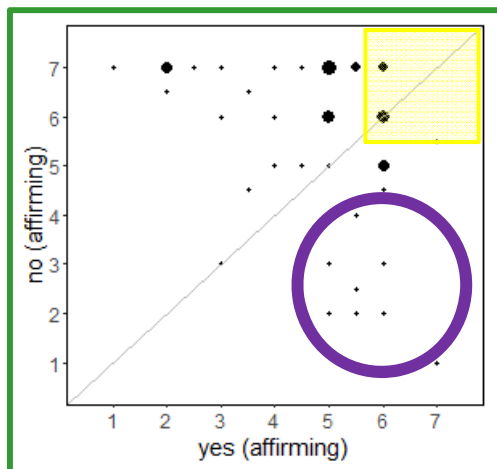
EXPRESSIVENESS >> REALIZE MARKED FEATURES >> REALIZE **RELATIVE** FEATURES



Responses to assertions - Dutch

The gardener hasn't sown the lawn yet.

Ja/Nee, he...



[AGREE, -]

[AGREE] → *ja*, [-] → *nee*

nee > *ja* (majority of speakers)

[REVERSE, +]

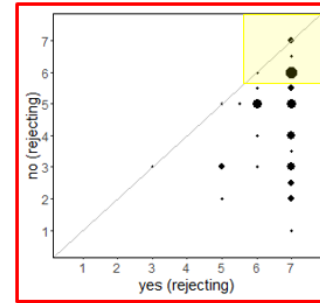
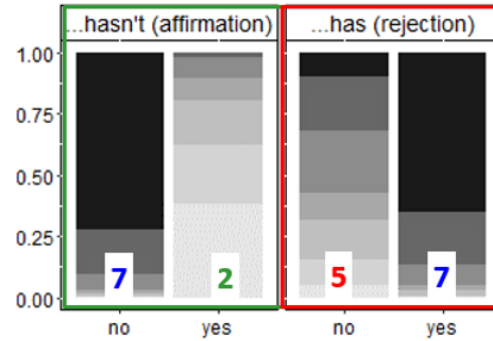
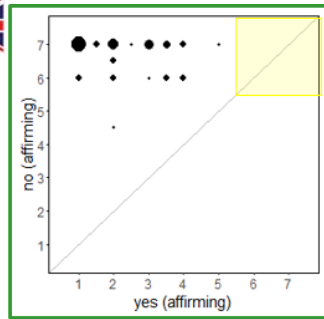
[REVERSE] → *nee*, [+] → *ja*

nee > *ja*

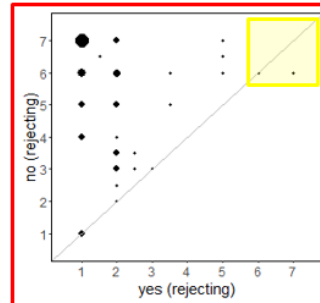
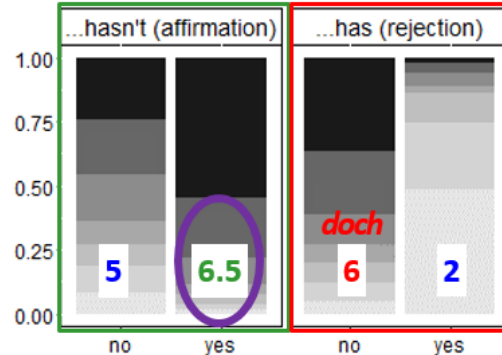
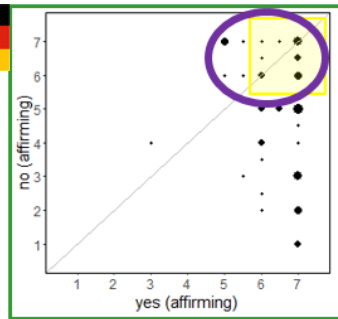
[REVERSE], [-] → *nee*; [AGREE], [+] → *ja*

EXPRESSIVENESS >> REALIZE MARKED FEATURES >> REALIZE **RELATIVE** FEATURES

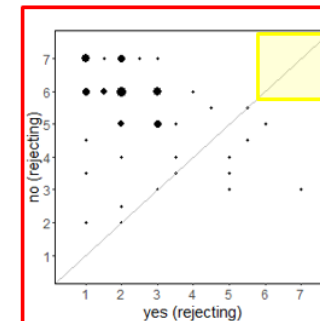
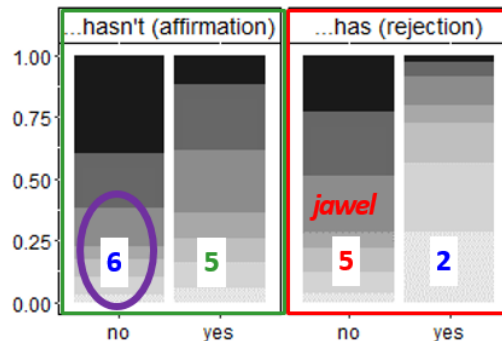
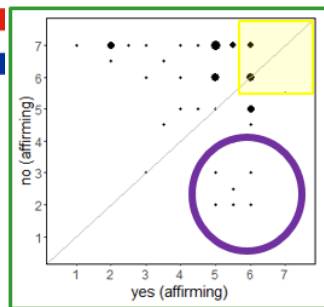
Summary



- Several unpredicted results
- Same lexical entries for *yes/no* for these languages



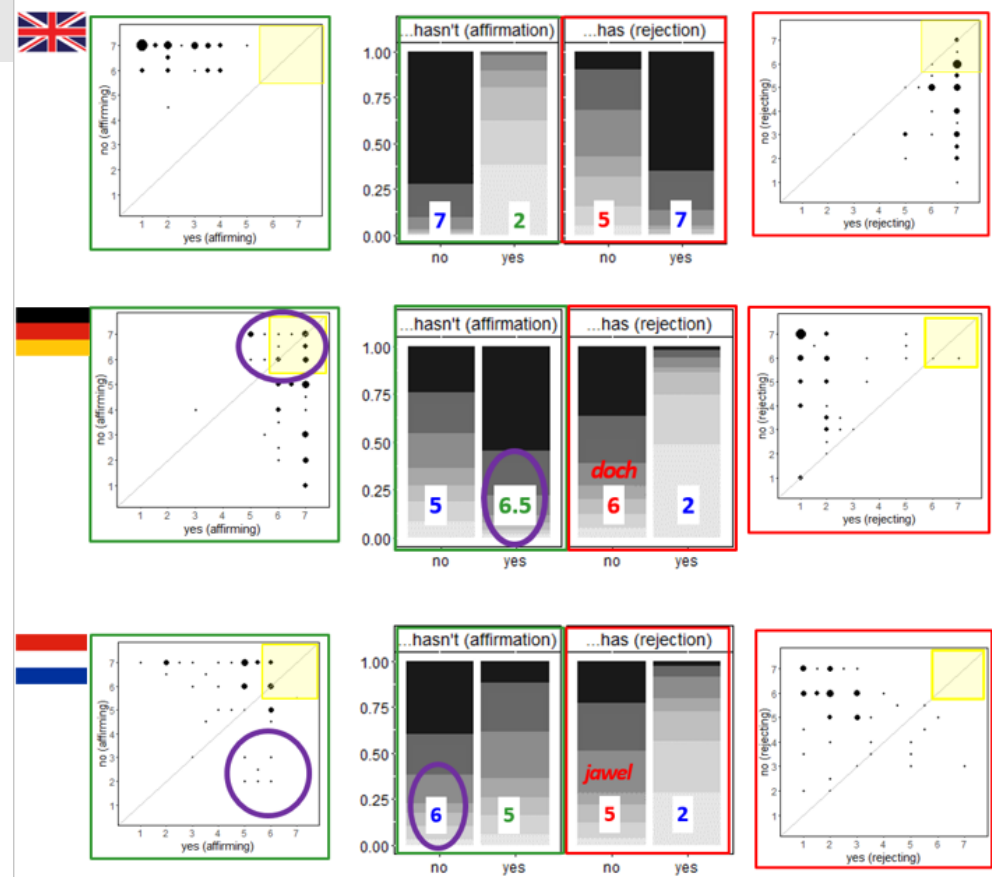
- Same lexical entry for [REVERSE, +] particle
- Different realization preferences for features, esp.



- REALIZE ABSOLUTE
- REALIZE MARKED < >
- REALIZE RELATIVE
- Considerable inter-individual variation

Summary

- The presence of a dedicated rejecting particle (*jawel, doch*) does not correlate with realization preferences for certain features (absolute / relative).
- For some speakers, there is no clear blocking effect for *nee/nein* triggered by the dedicated particle rejecting particle
- For some speakers, there are no clear preferences for *no* vs. *yes*, e.g.
 - in English rejections
 - in German affirmations
- Some speakers do not fully accept *yes* and *no*.



Interim discussion

- The feature account (updated variant; Farkas & Roelofsen 2018) can capture the main acceptability patterns for response particles in the three languages. It combines the traditional truth vs. polarity idea with independent pragmatic principles (agreeing > disagreeing; blocking).
- However, the inter-individual variation and subtle differences between the languages cannot be explained in a satisfactory way yet:
 - different tasks in experiments?
 - prosodic factors? gestures?
 - contextual aspects (speaker expectations / intents) etc.?
- Other accounts require closer scrutiny, e.g.
 - Krifka's anaphoric account predicts (differential) sensitivity to the saliency of positive vs. negative discourse referents (not confirmed in the experiments)
 - The syntactic accounts unvariably end up with several different versions of the response particles (e.g. 2 *yes* and 2 *no*), which might be considered a drawback.

Multi-methodical approach

- Objectives:
 - replication of partly surprising results
 - exploration of variability
 - ↳ by employing different tasks (task-dependent results?)
 - ↳ by testing different measures (information on other linguistic factors?)
- Several studies:
 - Written production: Multiple choice task [CHOOSE PARTICLE] for affirmations of negative antecedents (Frühauf, Claus, Repp, Krifka & Meijer 2017)
 - Written interpretation of response particles after negative assertions (Frühauf et al. 2017)
 - Oral production: New data – including analysis of prosody

Multi-methodical approach: Multiple Choice

[CHOOSE PARTICLE] for affirmations of negative antecedents – written “production” (Frühauf, Claus, Repp, Krifka & Meijer 2017)

- 43 participants Berlin-Brandenburg area
- Materials – critical items:
 - Der Gärtner hat den Rasen noch nicht gesät.
'The gardener hasn't sown the lawn yet.'
 - Ja, er hat den Rasen noch nicht gesät.
 - Nein, er hat den Rasen noch nicht gesät.
 - Doch, er hat den Rasen noch nicht gesät.
 - 'Ja/Nein/Doch, he hasn't sown the lawn yet.'
- Results:
 - 56% *ja*, 27% *nein*, 17% both *ja* and *nein* ($p < .001$)
 - Individual choice patterns [vs. acceptability study]
 - 50 % of participants clear preference for *ja*. [64.5%]
 - 20% clear preference for *nein* [23%]
 - 15% no clear preference (*ja* and *nein* equally often) [12.5%]
- Findings roughly replicate acceptability patterns

Multi-methodical approach: Written interpretation

Interpretation of response particles after negative assertions (Frühauf et al.)

- 45 participants Berlin-Brandenburg area
- Materials: critical items
(*doch* was in the fillers)

Der Gärtner hat den Rasen noch nicht gesät.
'The gardener hasn't sown the lawn yet.'

Ja.

Der Gärtner hat den Rasen noch nicht gesät.
'The gardener hasn't sown the lawn yet.'

Nein.

- The gardener hasn't sown the lawn yet. (affirming response)
- The gardener has sown the lawn already. (rejecting response)
- Without additional information it is not clear to me, what the response means.

Multi-methodical approach: Written interpretation

- Results:
 - Interpretation as affirmation: *ja* – 93.1%, *nein* – 84.7%
 - Individual participants:
 - 80% of participants interpreted *ja/nein* consistently as affirming
 - 13% participants: *ja* = affirming, *nein* = unclear or rejecting
 - 7% participants: *nein* = affirming, *ja* = unclear
- *Nein* as clearly affirming for most = unexpected.
- Expressiveness (*doch*) more „effective“ in interpretation than in acceptability?

nein [REVERSE], [-] / *ja* [AGREE], [+]

EXPRESSIVENESS >> REALIZE RELATIVE FEATURES >> REALIZE MARKED FEATURES

Multi-methodical approach: Oral production

- 32 participants (Cologne), 16 male, 16 female; students
- Participants took part in artificial dialogues between
 - a male or female speaker (balanced)
 - a speaker with a sex-unspecific name - *Alex* - , whose role participants were instructed to take in the dialogue

Petra und Alex leiten eine Musikschule, in der jedes Jahr ein Klavierkonzert stattfindet. Dieses Jahr soll der neue Klavierlehrer Hagen das Konzert organisieren. Hagen hat Alex stolz erzählt, dass das Programm schon fertig ist.
Bei ihrem wöchentlichen Treffen besprechen Petra und Alex gerade, was Hagen für das Konzert schon vorbereitet hat. Petra sagt:



Information about facts
(done already, still to do)



Petra und Alex leiten eine Musikschule, in der jedes Jahr ein Klavierkonzert stattfindet. Dieses Jahr soll der neue Klavierlehrer Hagen das Konzert organisieren. Hagen hat Alex stolz erzählt, dass das Programm schon fertig ist.
Bei ihrem wöchentlichen Treffen besprechen Petra und Alex gerade, was Hagen für das Konzert schon vorbereitet hat. Petra sagt:



Hagen hat das Programm noch nicht zusammengestellt.

Petra



Assertion
(done already, still to do)



Petra und Alex leiten eine Musikschule, in der jedes Jahr ein Klavierkonzert stattfindet. Dieses Jahr soll der neue Klavierlehrer Hagen das Konzert organisieren. Hagen hat Alex stolz erzählt, dass das Programm schon fertig ist.
Bei ihrem wöchentlichen Treffen besprechen Petra und Alex gerade, was Hagen für das Konzert schon vorbereitet hat. Petra sagt:



Hagen hat das Programm noch nicht zusammengestellt.

Petra

...



Alex

Rejection /
Affirmation
(particle +
response clause)



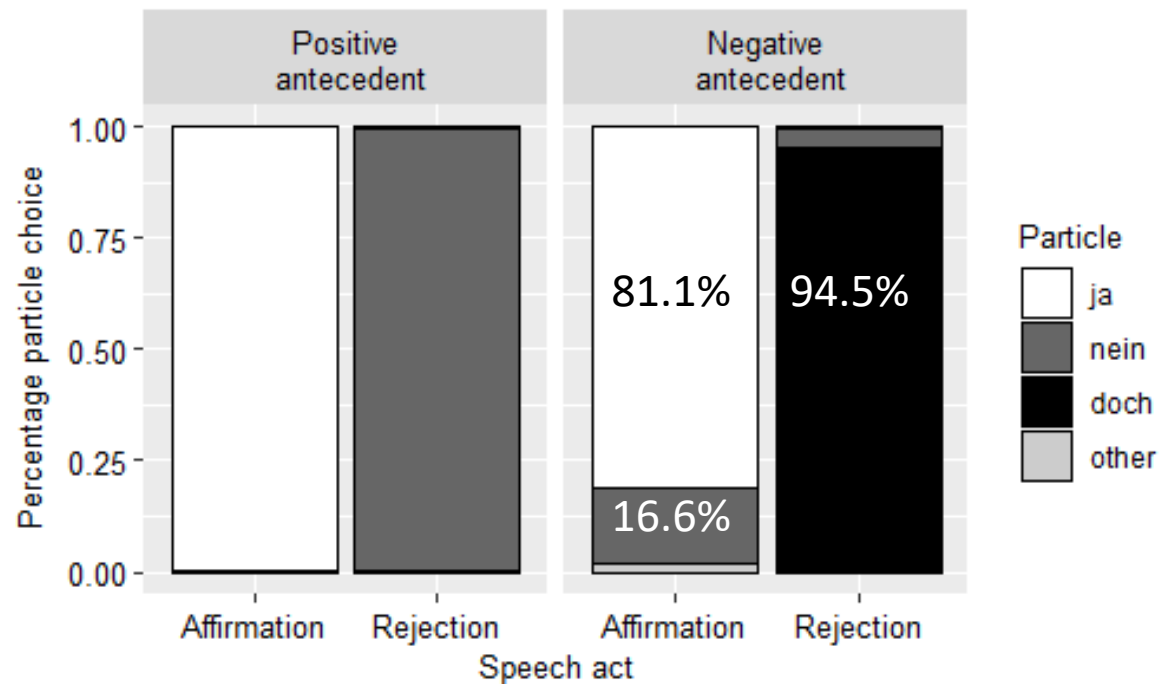
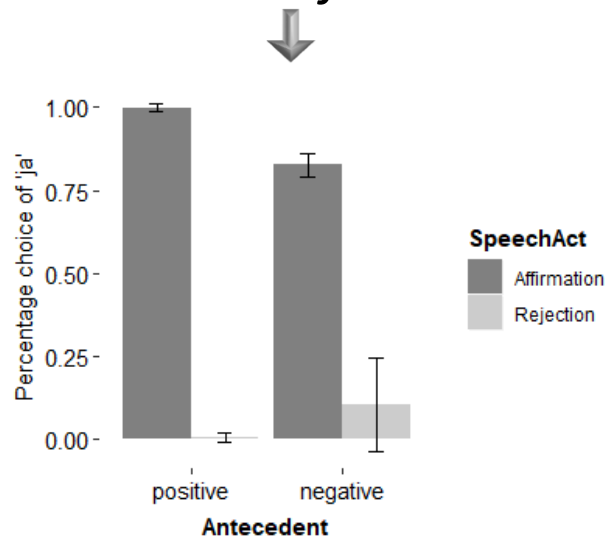
Multi-methodical approach: Oral production

- 48 lexicalizations in four conditions (two factors):
 - Antecedent (positive, negative)
 - Speech Act (affirmation, rejection)
- Latin square design: 48 dialogues per participant = 1536 responses
- Third factor: sex

- Results particle choice

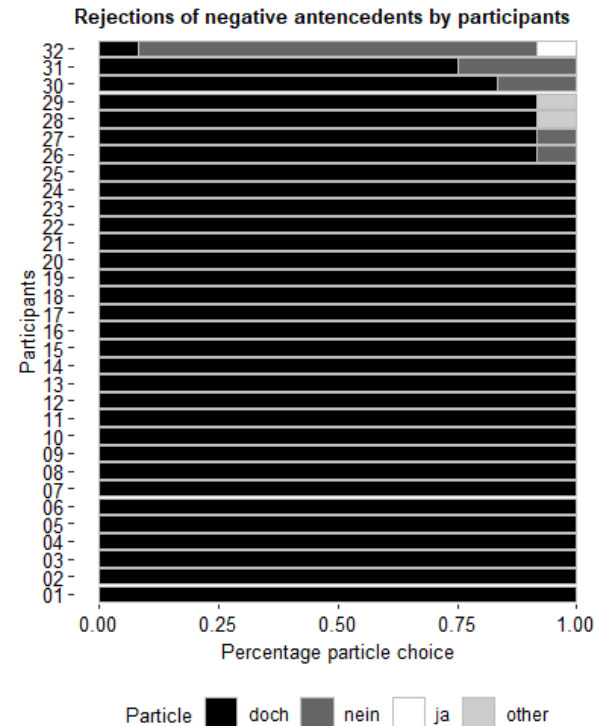
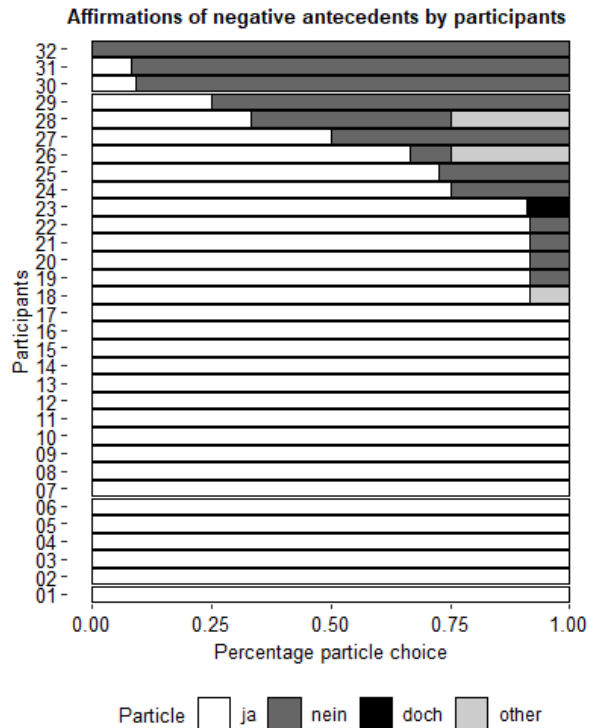
Total counts (in %)

Choice of *ja*



Multi-methodical approach: Oral production

- Individual variation for responses to negative assertions



Affirmations:

- 81% use *ja*; [acceptability *ja* > *nein*: 64.5%; multiple choice: 50% *ja*, 15% *ja+nein*; total *ja* = 65%)
- 16% preference for *nein* [acceptability: 23%; multiple choice: 20% *nein* + 15% *ja+nein*; total *nein* = 35%)

Multi-methodical approach: Oral production

Polarity of response clause

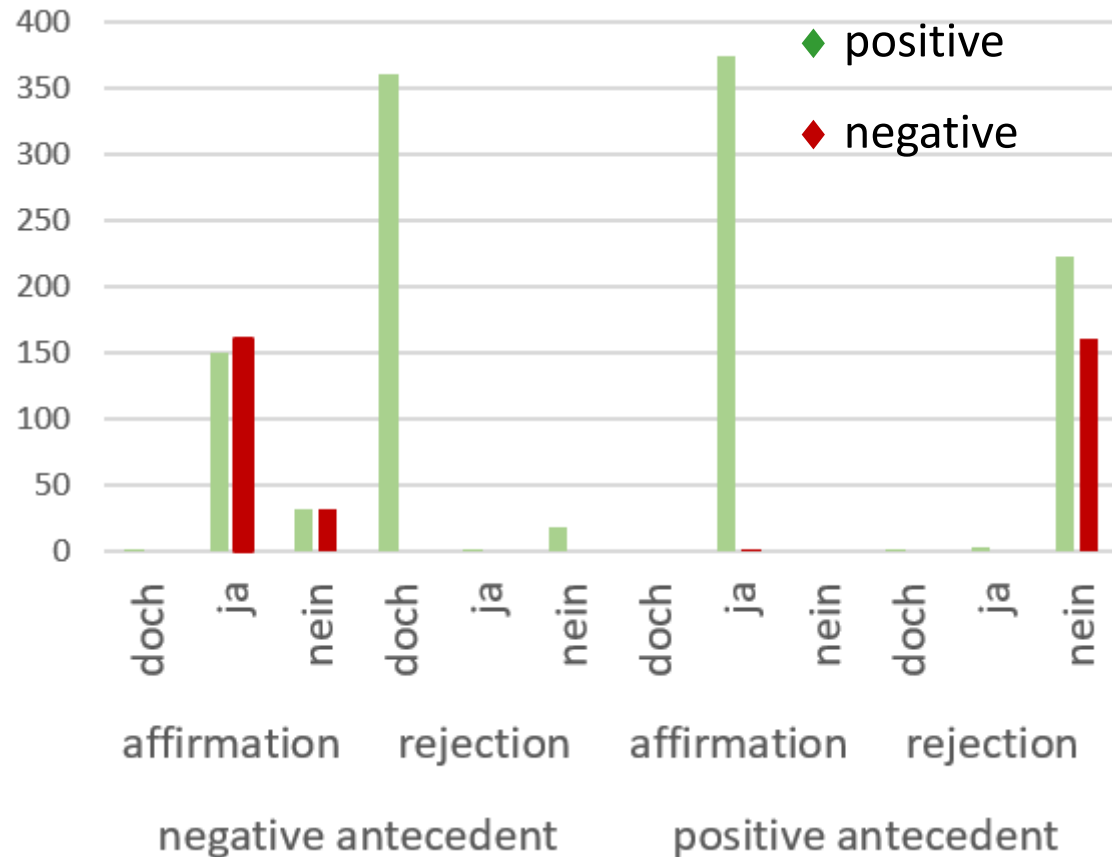
Negative antecedents:

- choice of *ja/nein* does not interact with polarity response clause.
- *doch* always comes with positive response clause

Positive antecedents:

- *ja* always comes with positive response clause

Otherwise, speakers freely use positive or negative response clauses.



Oral production: Prosody

Two types of comparison:

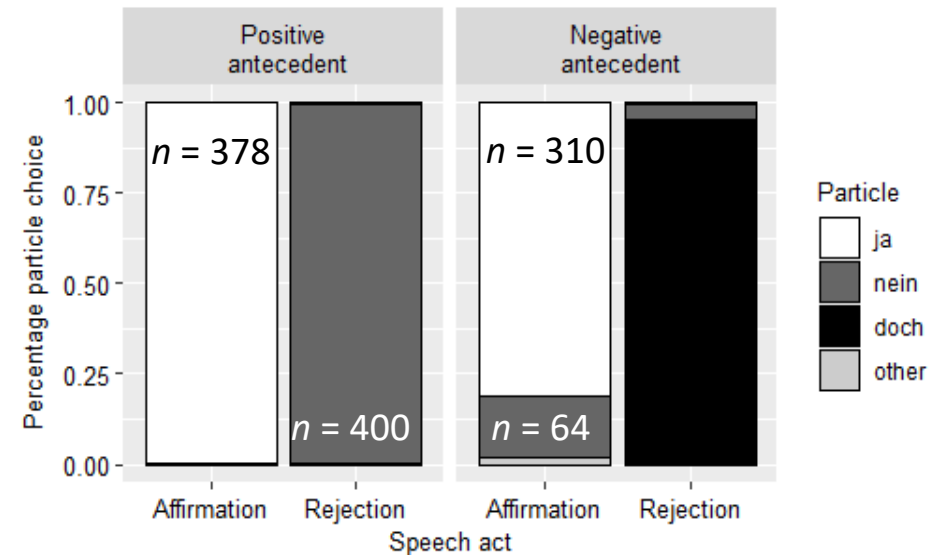
- *ja* after positive vs. after negative antecedents
- *nein* as rejection vs. affirmation

Acoustic measures

- duration of particle and of silence after particle
- maximum, mean and minimum pitch in particle
- position of pitch peak in particle (absolute, relative)
- pitch excursion
- intensity

Annotation of accent types according to DIMA annotation system (Kügler et al. 2015; version 2019)

- Collapsing of accent types into major types (see below)



Statistics: linear mixed models (lmer; lmerTest)

Statistics: generalized linear mixed models with binomial logit function

Oral production: prosody – acoustic measures

In responses to negative antecedents, *ja*

- is marginally longer [ms] ($b = 5, t = 1.96, p = .051$)
- has a lower maximum pitch [Hz] ($b = -4.4, t = -3.55, p < .001$)
- has a lower mean pitch [Hz] ($b = -2.1, t = -3.47, p < .001$)
- has a lower pitch excursion [st] ($b = -0.33, t = -2.85, p < .01$)

than in responses to positive antecedents, but the effect sizes are small.

In rejecting responses to positive antecedents, *nein*

- is longer ($b = -17.8, t = -3.106, p < .01$)
- has a lower minimum pitch, when uttered by female speakers ($b = -2.3, t = -2.21, p < .05$)

than in **affirming responses to negative antecedents**. The duration effect has an effect size that might be relevant in perception.

When something “special” happens (negative antecedent for *ja*; rejection), the respective particle is longer and lower.

Oral production: prosody – acoustic measures

Annotation and collapsing of DIMA-based accent types:

Statistics for **falls** vs. **rises** + **fall-rises**:

- There might be overall effects for affirmations vs. rejections in interaction with sex: women produce more rises in rejections than in affirmations, men do not (but we need more data, convergence issues)
- *ja* as affirmation after negative vs. positive antecedent:
no effects
- *nein* as affirmation of negative vs. as rejection of positive antecedent:
In rejections of positive antecedents, there are more rising accents than in affirmations of negative accents

Accent type	Accent	Frequency	
high	^H-%	22	
	H-%	70	
mid	^L-%	23	
	L-%	1	
fall	^H-L%	16	
	^H-^L%	34	
	^H-H%	17	
	H-^L%	152	
	H-L%	400	
	^L-L%	30	
	rise	L-^H%	20
		L-H%	450
		L-^L%	40
		^L-^H%	34
^L-H%		124	
fall.rise	^L-H-%	1	
	H-^H%	13	
	^HL-^H%	2	
	^HL-H%	2	
	^H^L-H%	3	
	HL-^H%	14	
	HL-H%	26	
	HL-^L%	2	
	H^L-^H%	1	
	H^L-H%	3	
^LL-H%	15		

Discussion

Mostly replication of findings from acceptability studies **but**:

- degree of preference for *ja* as affirming particle for negative antecedents depends on the task:
 - multiple choice written production: similar preference → task seems tap into similar communicative goal as acceptability rating task
 - single choice oral production: very strong preference, still inter-individual variation, less intra-individual variation
 - interpretation: much reduced preference – *nein* also is interpreted as clearly affirming, though still some inter-individual variation
- Idee put forward in Claus, Meijer, Repp & Krifka (2017), viz. that speakers have different grammars but are aware of other grammars gets support from these findings.

Discussion

- Grammar
 - All speakers: *nein* [REVERSE], [-] / *ja* [AGREE], [+]
 - Majority grammar
 - EXPRESSIVENESS >> REALIZE RELATIVE FEATURES >> REALIZE MARKED FEATURES
 - Minority grammar
 - EXPRESSIVENESS >> REALIZE MARKED FEATURES >> REALIZE RELATIVE FEATURES
- Task-dependent performance
 - Acceptability & multiple choice production: fairly high acceptance of *nein* as affirmation → minority grammar is known to all speakers
 - Interpretation: extremely high acceptance of *nein* as affirmation
 - in both grammars *doch* is the dedicated particle for rejections
 - if a speaker needs to decide what *nein* means, the blocking effect seems to kick in in both grammars equally strong (not predicted)
 - Oral production: Speakers use their own grammar

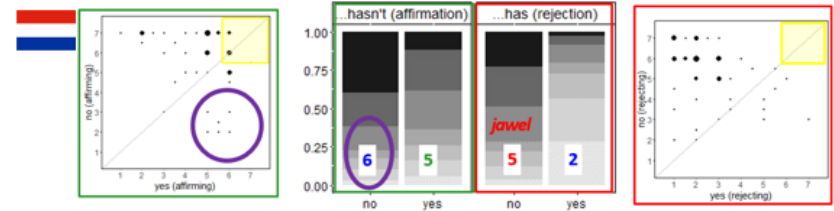
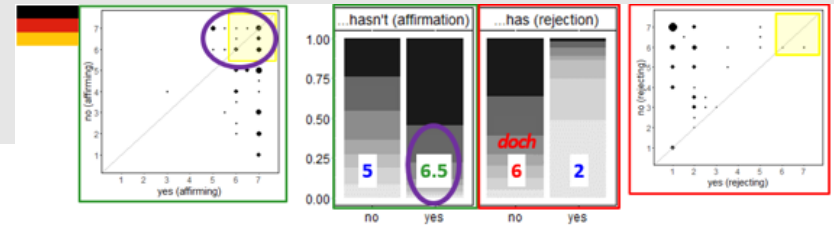
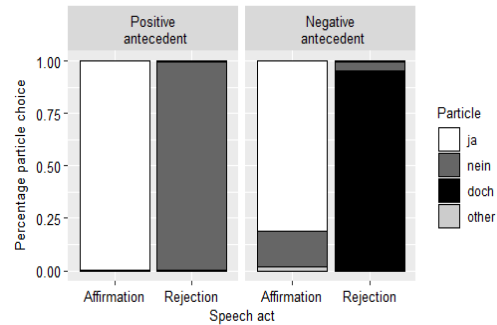
Discussion

- Tackling the inter-individual and intra-individual variation:
 - No solution is to be found in the choice of response clause
 - Prosody IS used differently in the different polarity contexts:
 - acoustic effects
 - phonological effects (accents)

However, the effects are small.
Perception studies are needed.
- Where next?
 - totally free production studies (not restricted to *ja, nein, doch*)
 - corpus studies to uncover subtle context effects
 - get at speaker intentions / biases
 - gestures, facial expressions

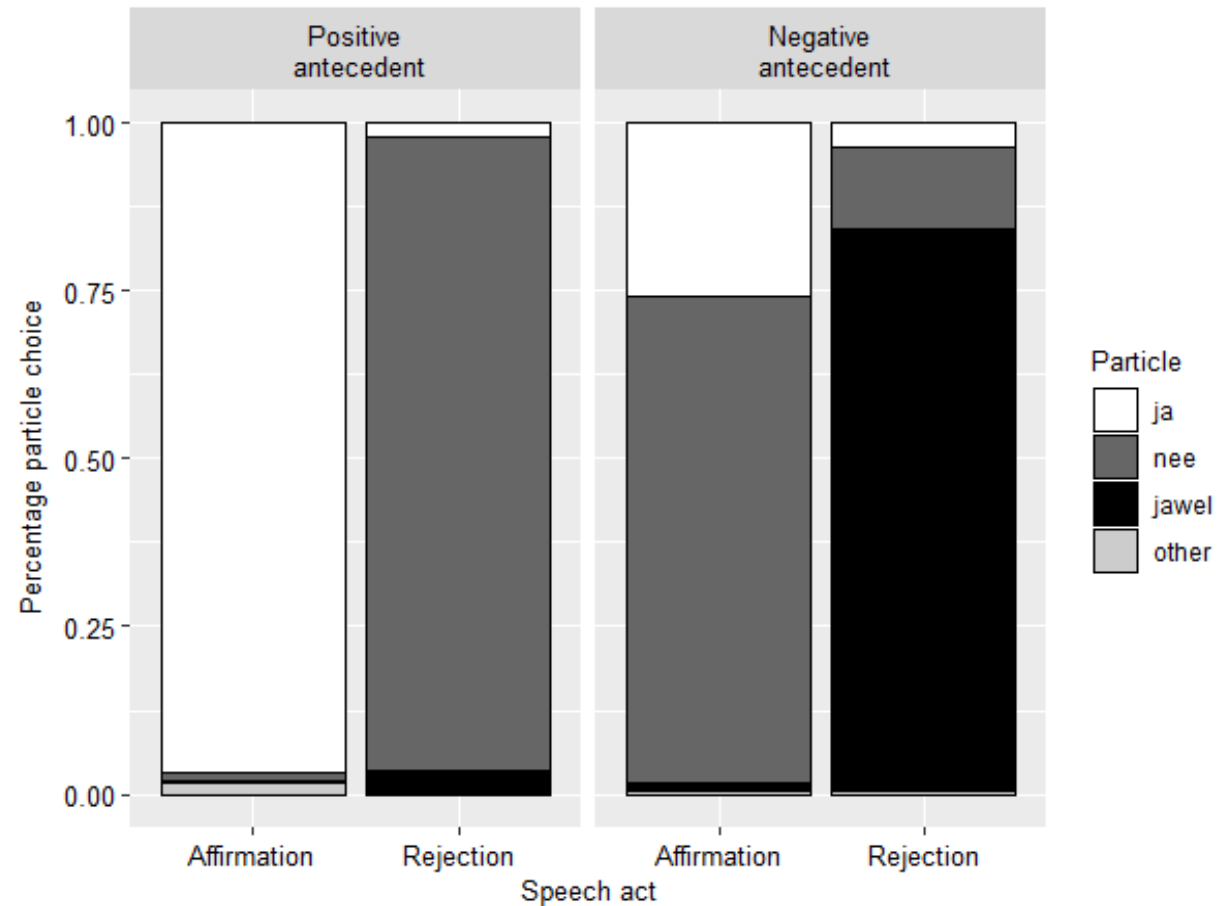
Work in progress: Dutch

Choice of particle

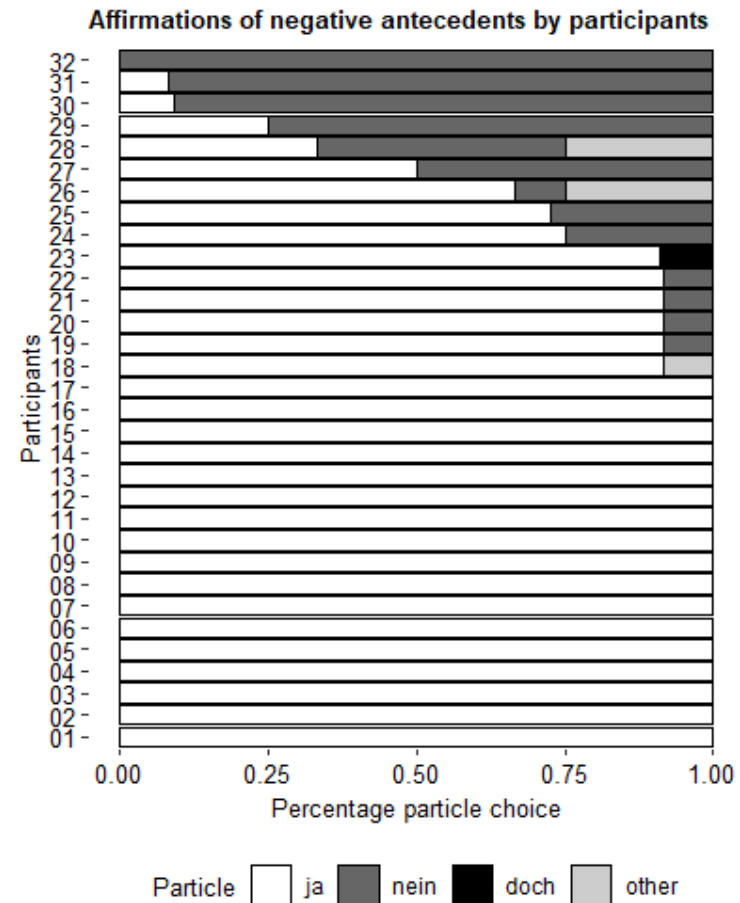
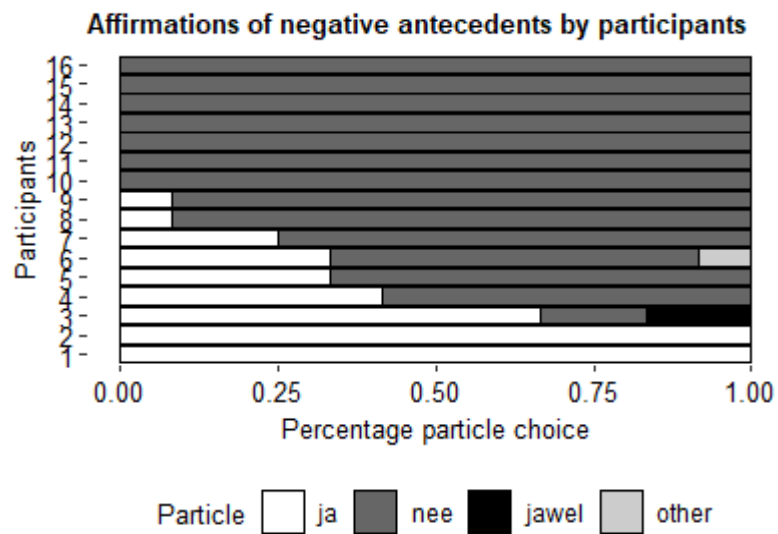


Production data largely replicate acceptability data.

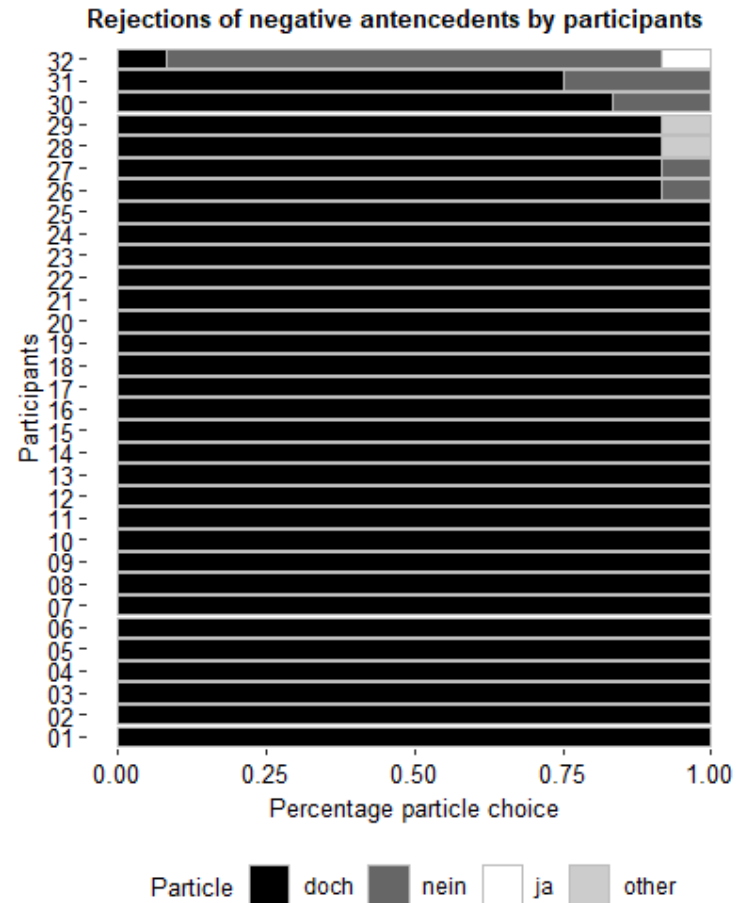
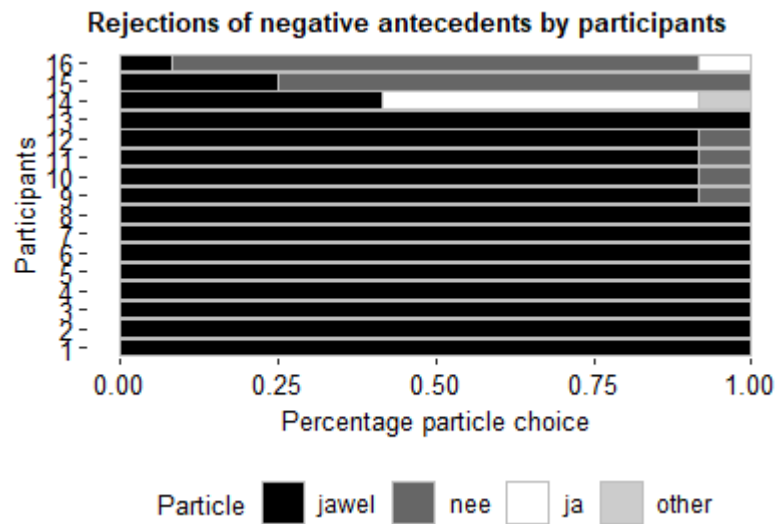
But: In rejections *nee-jawel* choice does not reflect acceptability.



Work in progress: Dutch



Work in progress: Dutch



Polarity particles in German Sign Language (DGS)

Research questions

- Which signs form part of the response particle system in DGS?
- What is the division of labor and interpretation of the various manual and nonmanual components:
 - manual particles
 - (other manual elements)
 - mouthing
 - nonmanuals
- Which combinations are possible and do such combinations form complex response particles?

Method

- **Dialogue Completion Task** to elicit semi-spontaneous responses to positive and negative assertions (production study)
- **Participants:** 24 (near-)native DGS signers (17f, 7m, aged 18-55, M= 32) from various regions in Germany
- **Materials:** Same as in oral production study but with adaptations for deaf community (neutral and familiar as judged by our deaf research assistants and sign models)
- **2 x 2 design:** antecedent polarity (pos./neg.) x response type (affirm/reject) triggered by the context
24 exp. items per condition = 96 trials (distributed over 2 lists)

Method

- Participants watched videos in DGS involving the two characters Peter and Alex.

Video of narrator:

Peter and Alex are elementary school teachers. They're organizing a school party with the help of some of the parents. **Alex just learnt that the parents have already bought the beverages.** A little later, Peter and Alex discuss the tasks assigned to the parents.

Video of Peter: The parents haven't bought the beverages yet.

The parents have bought the beverages already.

Video recording of participant

Method

Sample negative statement

data protection

PARENTS DRINK FETCH NOT_YET

Method

Participants were encouraged to provide concise responses in the introductory instruction:



data protection

Materials & procedure

Sample responses

data protection

data protection

hs _____

WRONG

[falsch]

'wrong'

hn _____...

'The parents have already fetched the
drink crates for the summer party, eh,
the school party.'

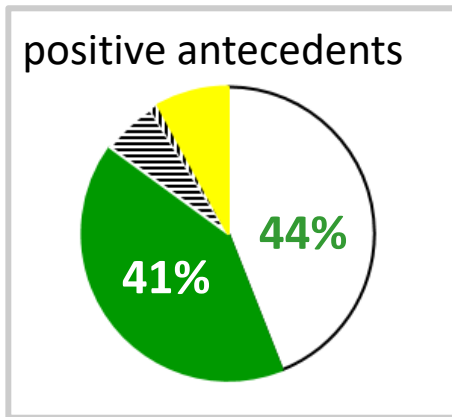
Annotation & Coding

- All 576 responses to **negative assertions** have been annotated in ELAN:
- Presence and type of response signs
- accompanying non-manuals:
 - mouthing
 - head nod, shake, tilt
 - brow raise/furrow

The screenshot displays the ELAN 5.3 software interface. The top window shows a video player with the text "data protection" overlaid. Below the video player is a list of annotations for a video clip. The annotations are organized into columns and rows, with a vertical red line indicating the current time position. The annotations include:

- default (r)
- Aussage-GLOSS (r) | NEIN, LAURA 2SAGEN1 IX3B XXX GEWESEN HEUTE BEITRETEN BASTELUNTERRICHT
- Aussage-Ubersetz (r) | Nein, Laura hat mir gesagt, dass sie heute im Bastelunterricht beigetreten ist.
- Partikel (r) | anders
- Triah-No. (r) | 01_b_P22
- Satzaussage kongr (r) | ja
- Kopfbewegung-Au (r) | n
- mehrAlsEinPartikel (r) | nein
- weitere Bemerkun (r) | 5-hand fuehrt NEIN Bewegung aus
- PartikelVorhanden (r) | ja
- nurMundbild (r) |
- nmm-Partikel (r) | bl-back
- Mundbild-Partikel (r) |
- Kopfbewegung-Par (r) | hs
- Partikel-Reduplikat (r) | nein

Responses to negative statements: affirmations



YES/NO:

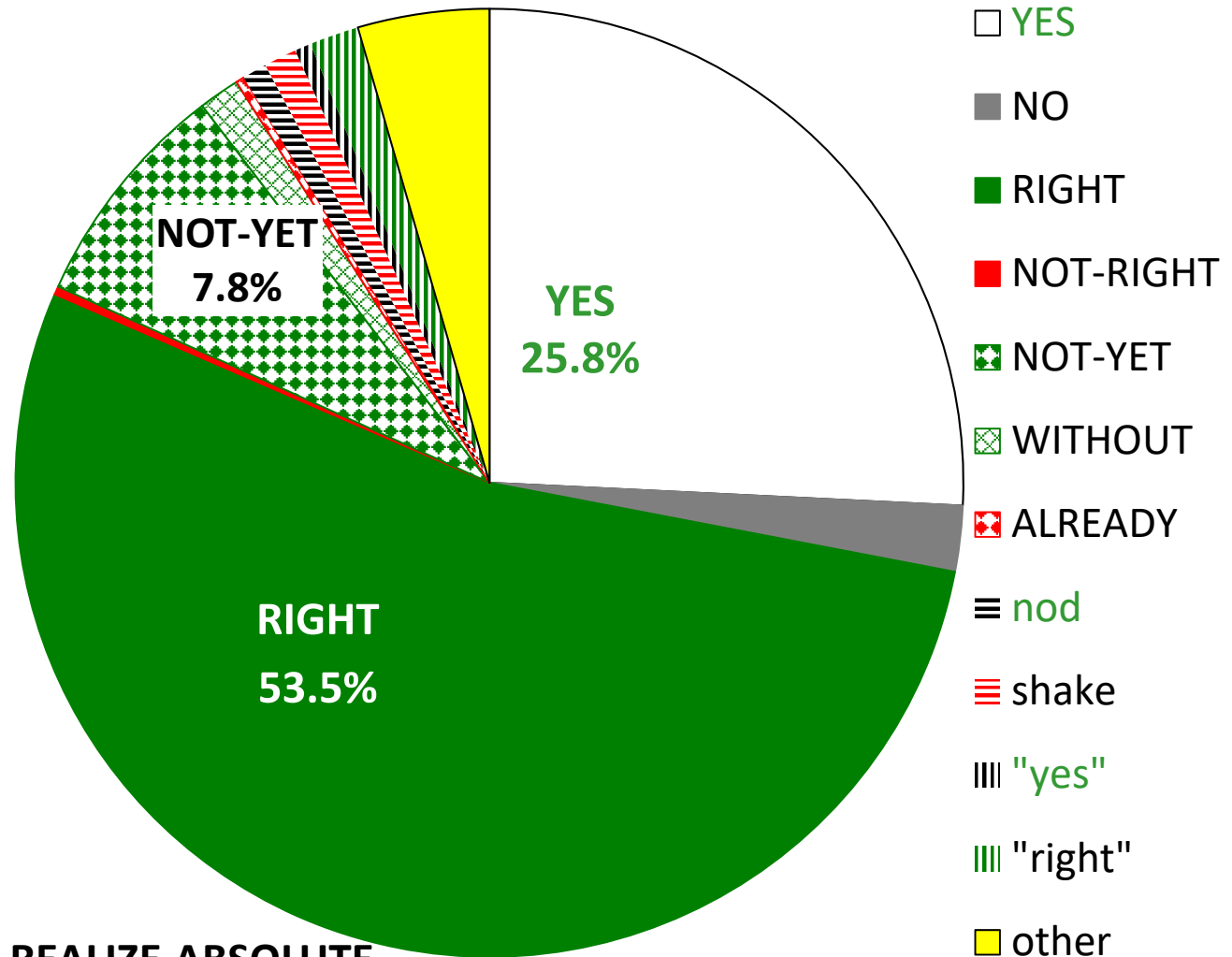
Very low number of NO-responses.

[AGREE][+] → YES

[REVERSE] → NO

? [-] → NO

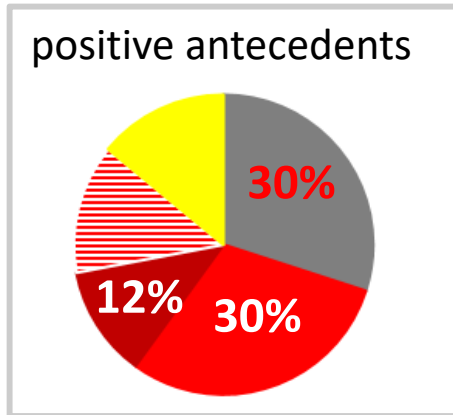
? REALIZE RELATIVE >> REALIZE ABSOLUTE



Other responses: preference for 'unambiguous' relative manuals

Responses to negative statements: rejections

Half of YES-responses have 'doch' mouthing
(used consistently by two participants)



YES/NO:

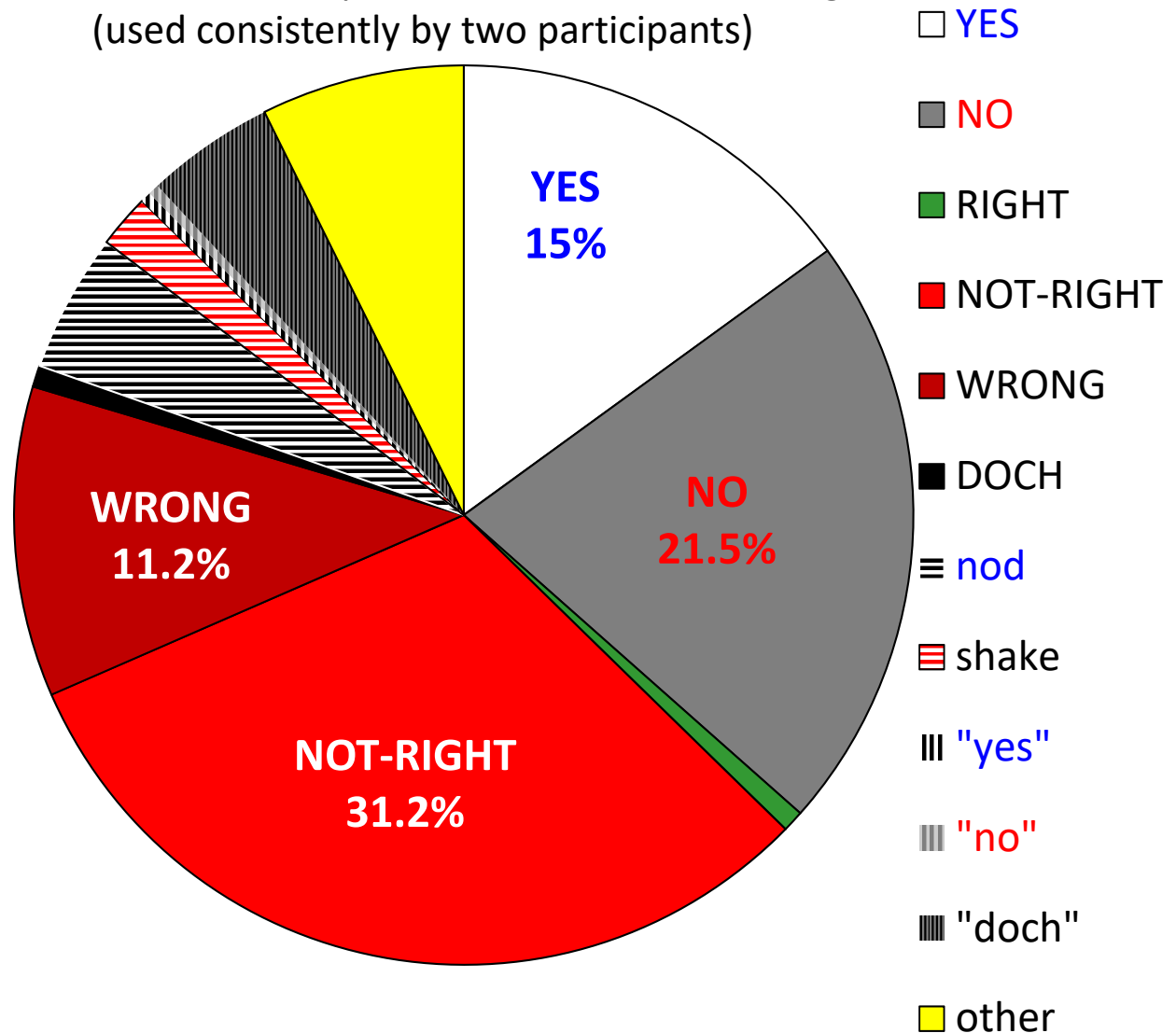
[AGREE][+] → YES

[REVERSE] → NO

? [-] → NO

? REALIZE RELATIVE >>

REALIZE ABSOLUTE



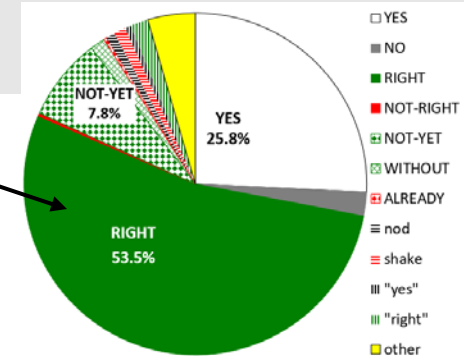
Other responses: preference for 'unambiguous' relative manuals

Response strategies after positive and negative antecedents

- Manual (usually in combination with non-manuals)
 - bare particle
 - particle + response clause
 - response clause only
- Non-manual only (with or without response clause):
 - mouthing only
 - head nod/head shake only
- Other layers of analysis (work in progress):
 - position of particle (sometimes also clause-final)
 - precise combinations
 - simultaneity / sequentially (not analyzed yet)

Affirmation of negative assertion

- bare particle (no occurrences for YES and NO)



data protection

data protection

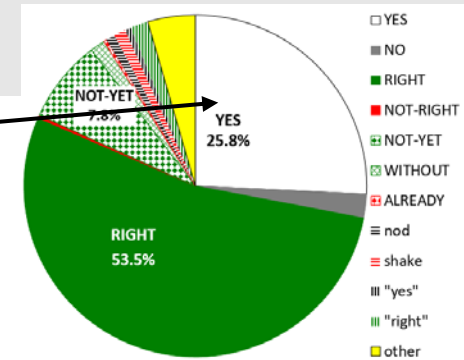
hn _____

“stimmt”
YES RIGHT
'(that's) right'

“stimmt”
RIGHT
'(that's) right'

Affirmation of negative assertion

- Particle + response clause: YES...



data protection

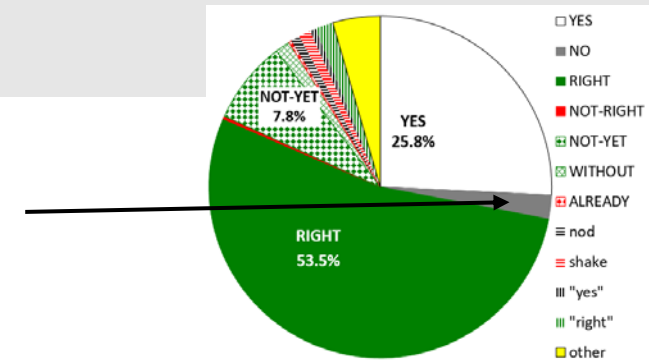
hn _____ hs _____
YES, IX-3 NOT-YET RENT (REASON...)

‘Yes, he hasn’t rented (the apartment) yet.’

Affirmation of negative assertion

- Particle + response clause: NO ... (only with positive response clauses)

data protection



(hs__)?

NO, WISH NEXT WEEK RETURN WISH IX-3

‘No, he wants to return (the waffle iron) next week.’

Affirmation of negative assertion

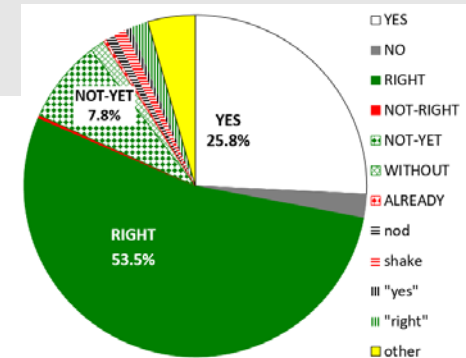
- Response clause only

A: Manuela has not returned the waffle iron yet.

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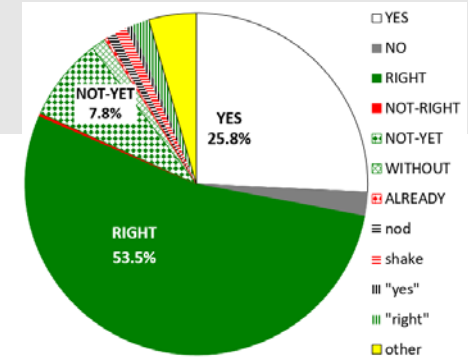
hn

WISH TOMORROW RETURN DUISBURG
'She will return it tomorrow in Duisburg.'



Affirmation of negative assertion

- Nonmanual strategies only: head movement + clause
A: The costume artist has not sewn the wolf costume yet.



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No isolated head nods

Some isolated head shakes

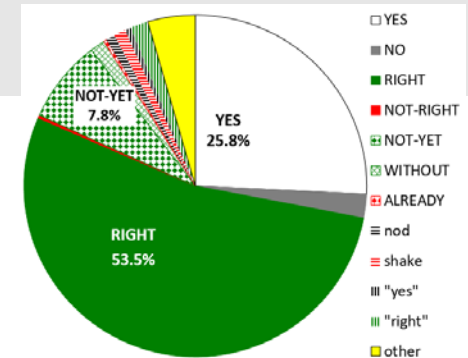
hs

TELL NEXT WEEK

'No, she tells (me) next week.'

Affirmation of negative assertion

- Nonmanual strategies only:
head movement + mouthing



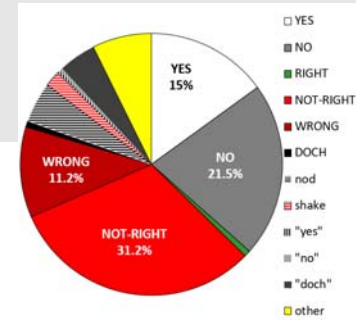
data protection

hn

“stimmt”

‘that’s right’

Rejection of negative assertion



- Bare particle

data protection

data protection

hs _____

“stimmt nicht”

NO NOT-RIGHT

‘(that’s) wrong’

NOT-RIGHT

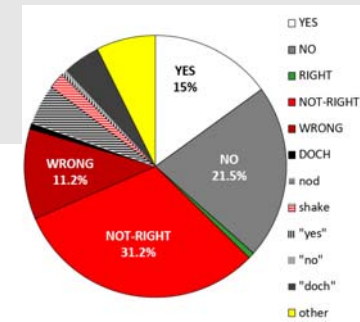
“falsch”

WRONG

‘(that’s) wrong’

Rejection of negative assertion

- Bare particle (YES only with “doch”-mouthing)



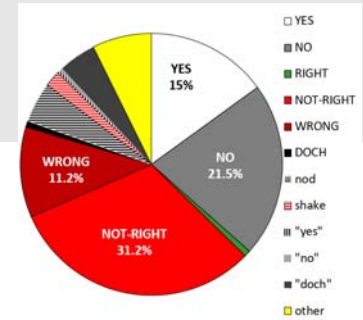
data protection

'doch'
NO^{Gesture} YES

Rejection of negative assertion

- Particle + response clause

data protection



hs _____ hn _____

NO, MANUELA FINISH WAFFLE-IRON ALREADY RETURN YES

‘No, Manuela has already returned the waffle iron yes.’

Rejection of negative assertion

- Particle + response clause

A: Mr. Miller has not ordered the wedding cake yet.

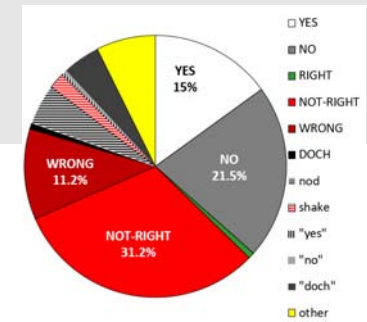
data protection

hn

“doch”

YES FINISH LAST WEEK

‘Yes, he took care (of that) last week.’



Rejection of negative assertion

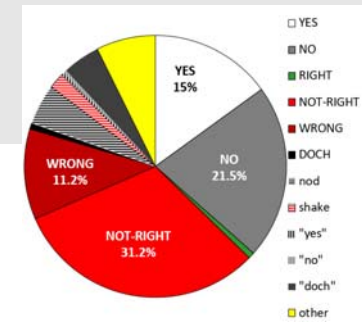
- Response clause only

A: Rebekkah has not labeled the pictures yet.

data protection

ALREADY WRITE ADD DONE END

‘(She) has already put labels (on the pictures).’



Rejection of negative assertion

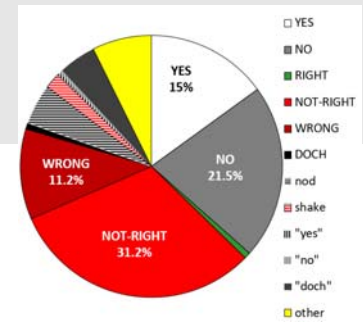
- Nonmanual strategies: head movement (hs)

A: Uwe has not installed the sinks yet.

data protection

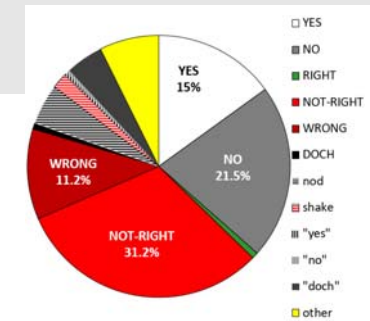
hs hn
DONE INSTALL

‘No he has installed (them).’



Rejection of negative assertion

- Nonmanual strategies: head movement (hn)
A: The costume designer has not sewn the wolf costume yet.



data protection

hn

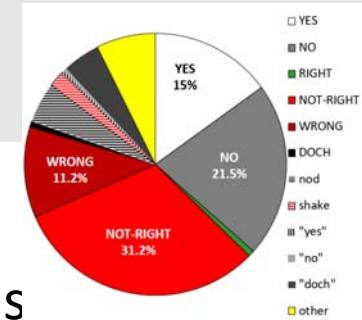
LAST WEEK DONE

‘Yes, (she) finished (it) last week.’

Rejection of negative assertion

- Nonmanual strategies: mouthing

A: Negative assertion: Nils has not shelved the chocolates ,



data protection

“doch”+hn

DONE

‘Doch, he has.’

Response strategies in DGS: 'mixed' responses

- Complementary information of manuals/non-manuals rare:
 - manual truth + nonmanual negative polarity (4 tokens)
 - nonmanual truth + manual negative polarity (6 tokens)

data protection

hs hn

YES STIMMT

data protection

hs

YES RIGHT

Response strategies in DGS: 'mixed' responses

data protection

hn_____

RIGHT NOT-YET RIGHT

[stimmt noch stimmt]

The meaning of YES and NO in DGS

- [+] and [AGREE] → YES

[+] a. “doch”

YES FINISH LAST WEEK

‘Yes, he took care (of that) last week.’

[AGREE] b. YES, IX-3 NOT-YET RENT (REASON...)

‘Yes, he hasn’t rented (the apartment) yet.’

- [REVERSE] → NO; ? [-] → NO (very few occurrences)

[-] a. NO, WISH NEXT WEEK RETURN WISH IX-3

‘No, he wants to return (the waffle iron) next week.’

[REVERSE] b. NO, MANUELA FINISH WAFFLE-IRON ALREADY RETURN YES

‘No, Manuela has already returned the waffle iron yes.’

DGS exhibits a preference for expressing relative features.

The meaning of head nod/shake in DGS

detailed
numbers not
yet available

- [+] and [AGREE] → **head nod**

a. hn

LAST WEEK DONE

‘She finished last week.’

b. _____ hn

NOT-YET

‘He has not done that yet.’

- [−] and [REVERSE] → **headshake**

c. hn _____ hs _____

YES, IX-3 NOT-YET RENT (REASON...)

‘Yes, he hasn’t rented (the apartment) yet.’

d. _____ hs _____ hn _____

DONE INSTALL

‘No he has installed (them).’

When headshakes occur over the response clause, they encode [−]

Does DGS have more than 2 response particles?

- Combinations of manual and nonmanuals and/or mouthing forming a particle: one candidate:

“doch”

YES

- Only used consistently by 2-3 participants but known by more → 3-particle system?
- Similar to German YES + “doch” >> NO >> YES in rejecting responses to negative assertions (cf. Claus, Meijer, Repp & Krifka 2017)
- *yes* is used for indicating absolute feature [+] here – which is in contrast with the general preference for realizing relative features
- Observation: Dedicated rejection particles in Dutch and Swedish also seem to build on *yes*:
 - DGS: **YES** + doch
 - Dutch: ***jawel***
 - Swedish: ***jo***

Thank you

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Theories of *yes* and *no* in English

Meaning of *yes/no* is derived at the **semantics-pragmatics interface**.

Response particles are **propositional anaphors / anaphoric operators**, e.g. Krifka (2013); Roelofsen & Farkas (2015)

R&F: [*Pete has not won.*]

Krifka: [*NOT* [*Pete has won.*]]

[anaphor + semantic/pragmatic conditions] \Rightarrow *No.* / *Yes.*

Meaning of *yes/no* is derived in the **syntax**.

Response particles are the remnant of an **elliptic clause** (Kramer & Rawlins 2011; Holmberg 2013, 2015)

Pete has not won.

*No*_[uNeg], *Pol*_[uNeg] ~~*Pete has not*_[iNeg] *won.*~~

negative feature chain

Yes, *Pol* ~~*Pete has not*_[iNeg] *won.*~~

Response particles may be **rejoinders** like *true/right* (Holmberg 2015)



Responses to assertions - Swedish

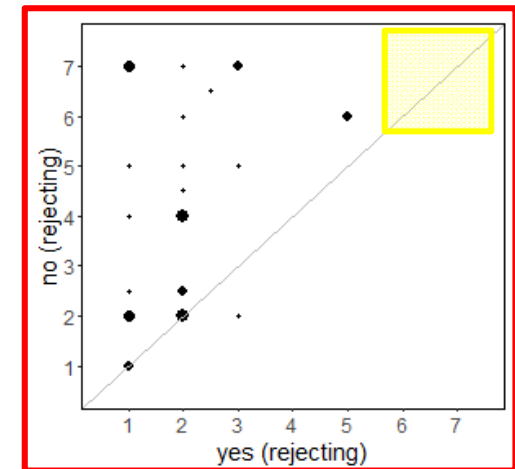
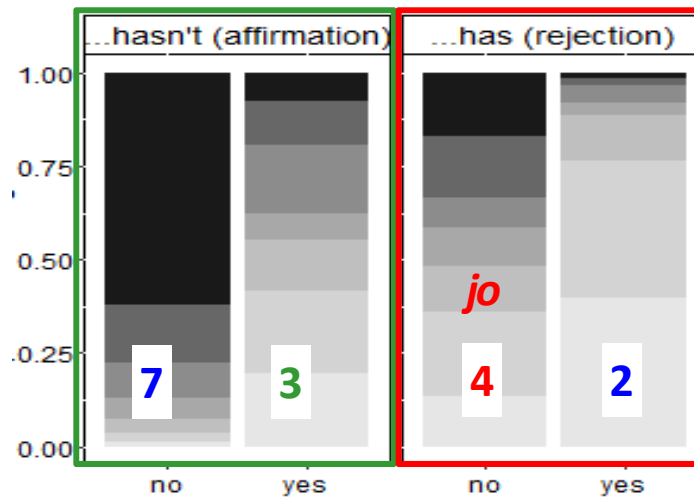
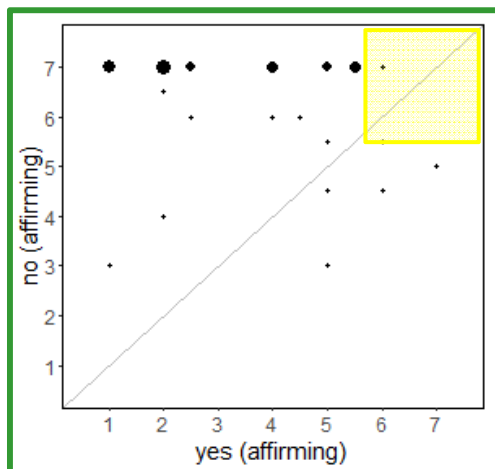
CLMMs: Interaction response clause × particle ($b = 0.58, se = .3, z = 2.0, p < .05$)

Affirmations: *nej* > *ja* ($b = -2.9, se = .5, z = -6.1, p < .001$)

Rejections: *nej* > *ja* ($b = -1.5, se = .3, z = -6.0, p < .001$)

The gardener hasn't sown the lawn yet.

Ja/Nej, he...

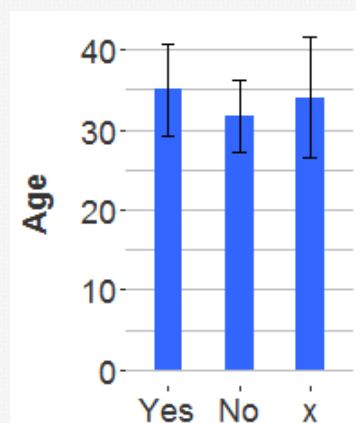
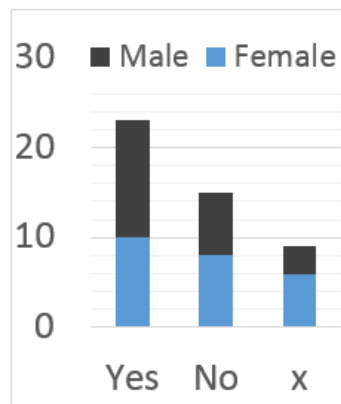


Potential non-linguistic individual differences

Sex, age, region of birth / of residence, handedness do not seem to play role.

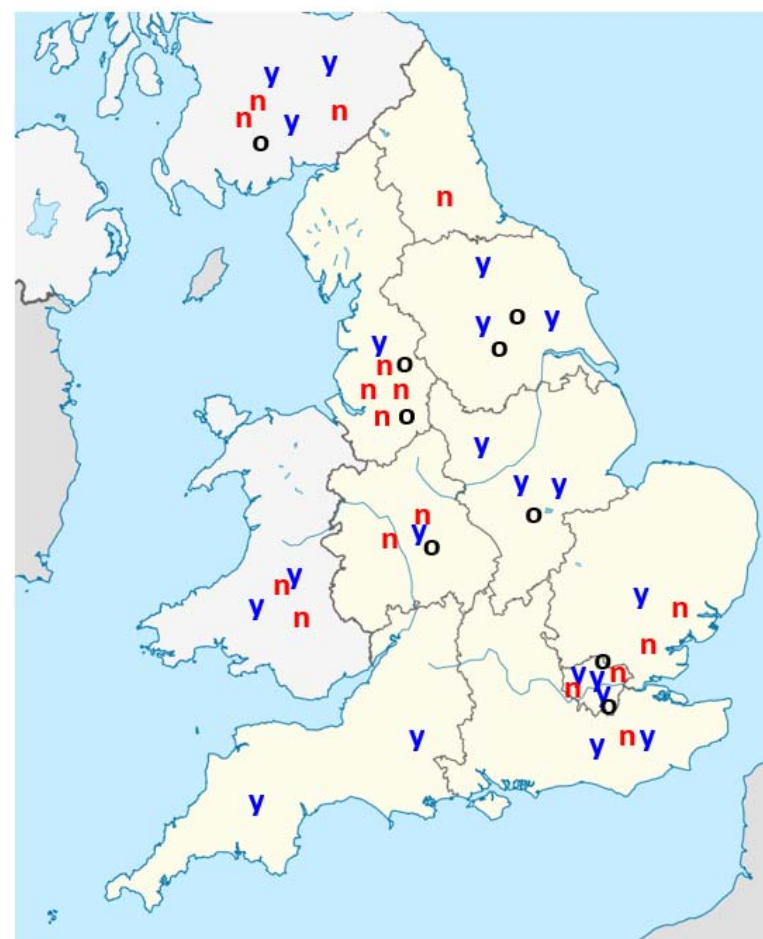
Here illustrated for English rejections of questions (additional experiments).

Sex & Age



↪ no correlation with response

Region of birth / of residence



↪ no correlation with response



Responses to statements - Dutch

- Is Dutch *jawel* ([REVERSE,+]) decomposable into *ja* and *wel*?
- *Ja*: [+]; *wel*: [REVERSE] – like Romanian *ba* (R&F 2015, F&R 2018) ??
- **Similarity** *ba* and *wel*:
 - Neither *ba* nor *wel* can be used as stand-alone responses:
A: Paul did not call.
B: ***Ba**./**Ba** da./Ba, he did. B': #Wel. (but cf. *Welles* in child speech)
- **Differences** *ba* and *wel*:
 - *Ba* can occur in [REVERSE,-] responses; *wel* cannot.
A: Paul called.
C: **Ba** nu./**Ba**, he didn't. C': #Nee wel.
 - *Wel* can be used in a [REVERSE,+] echo response with *jawel/nee*:
A: Paul did not call.
D: Jawel/Nee, hij belde wel. ('Yes/No, he DID call.')
- *Ba* and *wel* are not the same. So what does *wel* mark in *jawel*?



Responses to statements - Dutch

- *Wel* marks positive polarity (Zeijlstra 2004, Hogeweg 2009, Sudhoff 2016) = [+] in the feature system.
- Two options for accounting for *jawel*:
 - *Jawel* is lexicalization of [REVERSE,+]
 - But: Lexicalization path?
 - Neither *ja* nor *wel* seem semantically related to REVERSE.
 - On the other hand, *wel* also occurs as verum focus particle:
 - (1) Hij heeft WEL gewerkt (He DID work).
 - Verum focus often is used in rejection contexts
 - *Jawel* is decomposable and both *ja* and *wel* realize [+]
 - *Jawel* = „an emphatic positive morpheme“ (cf. F&R 2018 on French *si*)
 - However, why is repetition of *ja* not an option – like in Portuguese (González-Fuente et al. 2015)?