Particle responses to negative assertions and questions:
Two groups of speakers for the German response particles *ja* and *nein*

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Yes and No

A: Bill smokes.
B: Yes. B’: No.

Does yes signal truth of antecedent and no its falsity? Or does yes signal positive response clause polarity (e.g. he does smoke) and no negative response clause polarity (e.g. he doesn’t smoke)?

A: Bill doesn’t smoke.
B: Yes, he DOES. B’: Yes, he doesn’t.
B’’: No, he DOES. B’’’: No, he doesn’t.

Antecedent clauses with sentential negation: yes and no are not complementary.

However: there seem to be preference differences (cf. Brasoveanu et al., 2013; Kramer & Rawlins, 2012; Krifka, 2013; Roelofsen & Farkas, 2015)
German response particles

German response-particle system: three particles

Besides *ja* and *nein*: particle *doch* for rejecting responses to negative antecedent clauses

A: *Bill raucht.* (‘Bill smokes.’)
B:  i.  *Ja.* (= He does smoke.)
    ii.  *Nein.* (= He doesn’t smoke.)
    iii. *Doch.*

A: *Bill raucht nicht.* (‘Bill doesn’t smoke.’)
B:  i.  *Ja.* (= He doesn’t smoke.)
    ii.  *Nein.* (= He doesn’t smoke./= He does smoke.)
    iii. *Doch.* (= He does smoke.)
Two theories

Roelofsen & Farkas (2015, = R&F): feature model
Choice of response particle depends on two types of anaphoric features

**Absolute features**: polarity of response clause

**Relative features**: relation between polarity of response clause and polarity of antecedent clause

production perspective

Krifka (2013): saliency account
Negative antecedent clauses introduce two propositional discourse referents which differ in relative saliency, affecting interpretation preferences

comprehension perspective
R&F’s feature model

Features (absolute/relative) are hosted by the head of a PolP

Absolute features 
\([+], [-]\) impose presupposition on polarity of prejacent:
\([+] = \text{positive prejacent} \quad (\text{e.g. } \text{He does smoke})\)
\([-] = \text{negative prejacent} \quad (\text{e.g. } \text{He doesn’t smoke})\)

Relative features 
\([\text{AGREE}], [\text{REVERSE}]\) impose presupposition on polarity of prejacent in relation to polarity of antecedent
\([\text{AGREE}] = \text{same polarity} \quad (\text{e.g. A: Bill doesn’t smoke. B: He doesn’t smoke})\)
\([\text{REVERSE}] = \text{opposite polarity} \quad (\text{e.g. A: Bill doesn’t smoke. B: He does smoke})\)
R&F: feature realization

Feature realization potential of *ja*, *nein* and *doch*

*ja* can realize [+], or [AGREE]

*nein* can realize [–], or [REVERSE]

*doch* realizes [REVERSE, +]

Feature combinations and *ja/nein/doch*

A: *Bill raucht.* (‘Bill smokes’)

B: i. *Ja* (=he does) \[AGREE, +\]
   ii. *Nein* (=he doesn’t) \[REVERSE, –\]

A: *Bill raucht nicht.* (‘Bill doesn’t smoke’)

B: i. *Ja/Nein* (=he doesn’t) \[AGREE, –\]
   ii. *Doch* (=he does) \[REVERSE, +\]
R&F: markedness and predictions

R&F: markedness considerations

[–] is more marked than [+]  
(negated expressions are more marked than non-negated expressions)

[REVERSE] is more marked than [AGREE]  
(complement relation is more complex than identity relation)

[REVERSE,+] : special; most marked feature combination

More marked features have a higher realization need than less marked features

Preference predictions by R&F

Affirming responses to negative antecedents [AGREE,–]:  
Preference for *nein* over *ja* (*nein* realizes the marked feature [–])

Rejecting responses to negative antecedents [REVERSE,+] :  
Preference for *doch*, which realizes the most marked feature combination and blocks *nein* and *ja*
Krifka’s saliency account

Response particles = anaphors that pick up a propositional discourse referent (propDR), introduced by the antecedent

*ja* asserts the propDR it picks up

*nein* asserts the negation of the propDR it picks up

**Negative antecedents introduce two propDRs**

\[ \overline{p_{DR}}: \text{propDR is } \text{negated proposition} \quad [\text{e.g. } \neg(\text{smoke}(\text{Bill}))] \]

\[ p_{DR}: \text{propDR is } \text{positive proposition} \quad \text{in the scope of the negation operator} \quad [\text{e.g. } (\text{smoke}(\text{Bill}))] \]

\[ \overline{p_{DR}} \text{ and } p_{DR} \text{ can both be picked up by } ja \text{ and } nein \]

A: Bill raucht nicht. (‘Bill doesn’t smoke’)

B: Nein (=he doesn’t) nein picks up and asserts negation of \( p_{DR} \)

Ja (=he doesn’t) ja picks up and asserts \( \overline{p_{DR}} \)

Nein (=he does) nein picks up and asserts negation of \( \overline{p_{DR}} \)

Ja (=he does) ja picks up and asserts \( p_{DR} \)
Krifka: relative saliency of propDRs

Krifka: saliency considerations – context effects

$p_{DR}$ [e.g. (smoke(Bill))] is by default more salient than $\overline{p}_{DR}$ [e.g. $\neg$(smoke(Bill))] because negative antecedents are usually used in contexts in which the non-negated proposition is salient already.

Reversed relative saliencies with negative contexts, e.g. if antecedent is preceded by a negative question such as *Which of your friends doesn’t smoke?*

More salient referents are more readily picked up by anaphors than less salient referents → proposed relative saliencies are assumed to affect preference patterns.
**Krifka: preference predictions**

**Affirming responses to negative antecedents**

Here: *nein* picks up $p_{DR}$ and *ja* picks up $\bar{p}_{DR}$

**Default contexts:** $p_{DR}$ more salient than $\bar{p}_{DR}$
Preference for *nein* over *ja*

**Negative contexts:** $\bar{p}_{DR}$ more salient than $p_{DR}$
Preference for *ja* over *nein*

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**Rejecting responses to negative antecedents**

Here: *nein* picks up $\bar{p}_{DR}$, *ja* picks up $p_{DR}$; *doch* also picks up $p_{DR}$ and blocks *ja*

**Default contexts:** $p_{DR}$ more salient than $\bar{p}_{DR}$
Preference for *doch* over *nein* (over *ja*)

**Negative contexts:** $\bar{p}_{DR}$ more salient than $p_{DR}$
Preference for *nein* over *doch* (over *ja*)
Summary of predictions

R&F’s feature model
no prediction of context effects

Affirming responses to negative antecedents
predicted preference pattern: \( nein > ja \)

Rejecting responses to negative antecedents
predicted preference pattern: \( doch > nein \approx ja \)

Krifka’s saliency account
context effects on predicted preference patterns

Affirming responses to negative antecedents
Default: \( nein > ja \) \hspace{1cm} \text{Negative context:} \; ja > nein

Rejecting responses to negative antecedents
Default: \( doch > nein > ja \) \hspace{1cm} \text{Negative context:} \; nein > doch > ja
Experimental investigation

Series of four acceptability-judgment experiments

Goal: investigating preference patterns of German response particles by experimentally contrasting the two competing theoretical accounts (feature model vs. saliency account)

Antecedents with sentential negation

Three experiments: antecedent = assertion
e.g. Der Gärtner hat den Rasen noch nicht gesät.
    'The gardener hasn't sown the lawn yet.'

One experiment: antecedent = polar question with low negation
e.g. Hat der Gärtner den Rasen noch nicht gesät?
    'Has the gardener not sown the lawn yet?'
General method

Participants read short dialogues

Dialogues were preceded by a scene-setting passage and consisted in two turns

Example (from Expt 1)

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

Hildegard:  *Nein, er hat den Rasen noch nicht gesät.*
           'No, he hasn’t sown the lawn yet.'

**Participants’ task:** judging the response w.r.t. how natural it appears and how suitable it seems in the given dialogue and context; scale ranging from 1 (very bad) to 7 (very good)

additional task: indicating the truth of a statement applying to the dialogue or the scene-setting passage preceding the dialogue
Context manipulation

To test for context effects, the context was manipulated via an embedded question in the scene setting passage.

**Positive** vs. **negative** context, assumed to be associated with salient $p_{DR}$ vs. $\bar{p}_{DR}$ (in Expt 1 and 2)

*Ludwig and Hildegard have their large garden redesigned.*

*They are talking about what the gardener has done already.*

*They are talking about what the gardener hasn’t done yet.*

**Neutral** vs. **negative** context, assumed to be associated with salient $p_{DR}$ vs. $\bar{p}_{DR}$ (in Expt 3)

*Ludwig and Hildegard have their large garden redesigned.*

*They are talking about the gardener and the redesigning of their garden.*

*They are talking about what the gardener hasn’t done yet.*
Between experiments: response

Experiments differed in response type

**Particle + follow-up phrase** (in Expt 1 and 2)

Ludwig: *The gardener hasn't sown the lawn yet.*
Hildegard: *Nein, he hasn’t sown the lawn yet.*

**Bare particle** (in Expt 3 and 4)

Ludwig: *The gardener hasn't sown the lawn yet.*
Hildegard: *Nein.*

To make clear whether a bare *ja* or *nein* should be taken as an affirming response: scene-setting passage included information on ‘epistemological state’ of responding person

*Ludwig and Hildegard have their large garden redesigned. This morning,* the gardener told Hildegard that he would *sow the lawn in a couple of days.* Now, Ludwig and Hildegard are talking about …
Summary of experiments

**Expt 1: affirming and rejecting responses to assertions**
Antecedent: assertion; Response: particle + follow-up phrase
2x2x2 within-subject design: 
*ja/nein* x affirming/rejecting response x positive/negative context
48 participants; 48 experimental items, 16 filler items

**Expt 2: including *doch*; focus on rejecting responses to assertions**
Antecedent: assertion; Response: particle + follow-up phrase
3x2 within-subject design: *ja/nein/doch* x positive/negative context
36 participants; 36 experimental items, 28 filler items

**Expt 3: focus on affirming responses to assertions**
Antecedent: assertion; Response: bare particle
2x2 within-subject design: *ja/nein* x neutral/negative context
24 participants; 24 experimental items, 40 filler items

**Expt 4: affirming and rejecting responses to polar questions**
Antecedent: polar question; Response: bare particle
2x2 within-subject design: *ja/nein* x affirming/rejecting response
24 participants; 24 experimental items, 24 filler items
Result preview: **no** significant interaction effects involving the factor **CONTEXT**! (contra predictions derived from saliency account)

In what follows
- only results of analyses obtained from data pooled over the two context conditions are presented
- splitting up results for rejecting and affirming responses
Results: rejecting responses

Mean ratings (scale: 1=very bad to 7=very good)

Expt 1
Expt 2
Expt 4

Expt 1 (follow-up phrase: *Ja/Nein, he has sown the lawn already*)
significant higher ratings for *nein* than for *ja*

Expt 2 (follow-up phrase: *Ja/Nein/Doch, he has sown the lawn already*)
highest ratings for *doch*; still significant difference btwn *ja* and *nein*

Expt 4 (bare particle responses to questions)
replication of significant difference btwn *ja* and *nein*

Results suggest that *ja* but not *nein* is blocked by *doch* (contra feature model); no evidence for interaction effects involving context (contra saliency account)
Results: affirming responses

Mean ratings (scale: 1=very bad to 7=very good)

Expt 1 (follow-up phrase: *Ja/Nein, he hasn’t sown the lawn yet*)
significant higher ratings for *ja* than for *nein*

Expt 3 (bare particle responses)
replication of significant difference btwn *ja* and *nein*

Expt 4 (bare particle responses to questions)
no significant difference btwn *ja* and *nein*

Results do neither correspond to predictions by feature model nor to predictions by saliency account.
Differences between participants

Closer inspection of data for affirming responses: **individual difference scores** (calculated by subtracting mean rating for *nein* from mean rating for *ja* after z-value transformation per participant)

Variability of positive and negative difference scores
Most participants: fairly large difference score, indicating preference for either *ja* or *nein*

→ Two subgroups: **Ja-group** and **Nein-group**
*Ja-group* and *Nein-group*

Two groups, differing in preference pattern for affirming responses *Ja-group*: ja > nein | *Nein-group*: nein > ja

**Ja-group**: majority (≈70% in Expt. 1 and 3, ≈60% in Expt. 4)
Ja-group and Nein-group

Two groups (based on ratings for affirming responses) also differ in their ratings for nein as rejecting response
Two groups – two systems

Truth-based vs. polarity-based system (cf. Pope, 1976)

Ja-group: truth-based system
  ja: signals truth of antecedent
  nein: signals falsity of antecedent

Nein-group: polarity-based system
  ja: signals that polarity of response clause is positive
  nein: signals that polarity of response clause is negative

Note: A language with three forms, such as German (ja, nein, doch) can have neither a purely truth-based system nor a purely polarity-based system
Back to feature model and saliency account

Main finding of present study: two groups, differing in preference pattern for rejecting responses to negative antecedents

**Ja-group** (majority): preference for *ja* over *nein*

**Nein-group**: preference for *nein* over *ja*

Inconsistent with predictions derived from feature model and saliency account

feature model: general preference for *nein* over *ja*

saliency account: default preference for *nein* over *ja* (+ context)

Can the two proposals be revised to account for the two groups?
Two groups in feature model

To account for the two groups, Floris Roelofsen and Donka Farkas suggested to us a revision of their proposal:

**Same realization potential** of the particles as in original account *for both groups*

*ja* can realize [AGREE] or [+]

*nein* can realize [REVERSE] or [-]

*doch* realizes [REVERSE,+]

Two groups differ in preference for the feature types

**Ja-group**: prefers to realize **relative** features ([AGREE] [REVERSE])

**Nein-group**: prefers to realize **absolute** features ([+] [-])

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<thead>
<tr>
<th></th>
<th><strong>Ja-group</strong></th>
<th><strong>Nein-group</strong></th>
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Two groups in feature model

Two groups differ in preference for the feature types

**Ja-group**: prefers to realize **relative** features ([AGREE] [REVERSE])

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**OR:** both groups: only doch can realize [REVERSE,+]  

**Issues**

- revision in terms of feature-type preference difference involves giving up core assumptions, i.e. markedness considerations

- revised model cannot account for our findings in [REVERSE,+] condition: nein is rated as quite acceptable by Ja-group, the analogous does not hold for ja and Nein-group (different from predictions derivable from revised model)
Two groups in saliency account

**Krifka (2013): main assumptions**

(1) Response particles are anaphors that pick up propDRs; *ja* asserts propDR and *nein* asserts negation of propDR

(2) Negative antecedents introduce two propDRs: \( \overline{p}_{DR} \) and \( p_{DR} \)

(3) \( \overline{p}_{DR} \) and \( p_{DR} \) differ in relative saliency, which is context-dependent

Present study: results are inconsistent with assumption (3)

**Preview of revision of saliency account**

**Ja-group**: \( \overline{p}_{DR} \) more salient than \( p_{DR} \)

**Nein-group**: \( \overline{p}_{DR} \) and \( p_{DR} \) do not differ in saliency

Assumptions (1) and (2) maintained

revised: *doch* picks up \( \overline{p}_{DR} \) (rather than \( p_{DR} \))
**Ja-group in saliency account**

**Ja-group:** $\overline{p}_{DR}$ more salient than $p_{DR}$

$\overline{p}_{DR}$ is introduced by non-embedded constituent, whereas $p_{DR}$ is introduced by embedded constituent.

Non-embedded constituents may be more accessible than embedded constituents (evidence from a study on complex NPs by Gordon et al. 1999).

A: *Bill raucht nicht.* (‘Bill doesn’t smoke’)

B:  

- *Ja* (=he doesn’t)  
  *ja* picks up and asserts $\overline{p}_{DR}$

- *Nein* (=he does)  
  *nein* picks up and asserts negation of $\overline{p}_{DR}$

- *Doch* (=he does)  
  *doch* picks up and asserts negation of $\overline{p}_{DR}$

*doch* and *nein*: same meaning (rejecting responses); *doch* is preferred over *nein* due to Maximize Presupposition (Heim 1991).
**Nein-group in saliency account**

**Nein-group**: $\overline{p_{DR}}$ and $p_{DR}$ do not differ in saliency

Thus, *ja* and *nein* are ambiguous (reference to $\overline{p_{DR}}$ or $p_{DR}$?) with negative antecedents

The use of *ja* in responses to negative antecedents is avoided to prevent ambiguity

As for *nein*: the two options are not equivalent insofar as picking up $\overline{p_{DR}}$ involves double negation; only picking up $\overline{p_{DR}}$ is avoided but not picking up $p_{DR}$

A:  *Bill raucht nicht.* (‘Bill doesn’t smoke’)

B:  $\overline{ja}$ (=he doesn’t)  *ja* picks up and asserts $\overline{P_{DR}}$

  $\overline{Ja}$ (=he does)  *ja* picks up and asserts $P_{DR}$

  $\overline{Nein}$ (=he does)  *nein* picks up and asserts negation of $\overline{P_{DR}}$

  $\overline{Nein}$ (=he doesn’t)  *nein* picks up and asserts negation of $P_{DR}$

  $\overline{Doch}$ (=he does)  *doch* picks up and asserts negation of $\overline{P_{DR}}$
Two groups in saliency account

Revision of saliency account

*Ja-group*: $\bar{p}_{DR}$ more salient than $p_{DR}$

*Nein-group*: $\bar{p}_{DR}$ and $p_{DR}$ equally salient; avoidance of double negation

Issues

- Novel assumptions that are awaiting testing (relation between embeddedness and salience and individual differences; avoidance of double negation)

- Difference between two groups attributed to negation related processing differences rather than to different response strategies
Conclusion

Experimental study on German response particles
Starting point: R&F’s feature model and Krifka’s saliency account

Unexpected results, demonstrating the importance of quantitative studies

Two groups of participants: Ja-group and Nein-group

Possible revisions of the proposals by R&F and Krifka to account for the two groups; both with issues

More data and theoretical work needed
Thanks to Felix Frühauf, Elisa Stein, and Katharina Vnoucek for their assistance in collecting the data