

**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

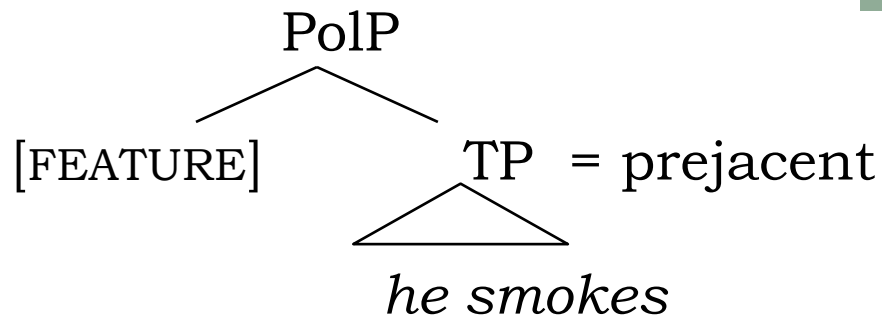
Krifka (2013): saliency account

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:

[+] = positive prejacent (e.g. *He does smoke*)

[-] = negative prejacent (e.g. *He doesn't smoke*)

Relative features [AGREE], [REVERSE] impose presupposition on polarity of prejacent in relation to polarity of antecedent

[AGREE] = same polarity

(e.g. A: *Bill doesn't smoke*. B: *He doesn't smoke*)

[REVERSE] = opposite polarity

(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

\bar{p}_{DR} : propDR is **negated proposition** [e.g. $\neg(\text{smoke}(\text{Bill}))$]

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

\bar{p}_{DR} and p_{DR} can both be picked up by *ja* 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 \bar{p}_{DR}

Nein (=he does) *nein* picks up and asserts negation of \bar{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 \bar{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*

A: Bill doesn't smoke.
B: He doesn't smoke.

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*)

A: Bill doesn't smoke.
B: He does smoke.

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* ≈ *ja*

Krifka's saliency account

context effects on predicted preference patterns

Affirming responses to negative antecedents

Default: *nein* > *ja*

Negative context: *ja* > *nein*

Rejecting responses to negative antecedents

Default: *doch* > *nein* > *ja*

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

Results: preface

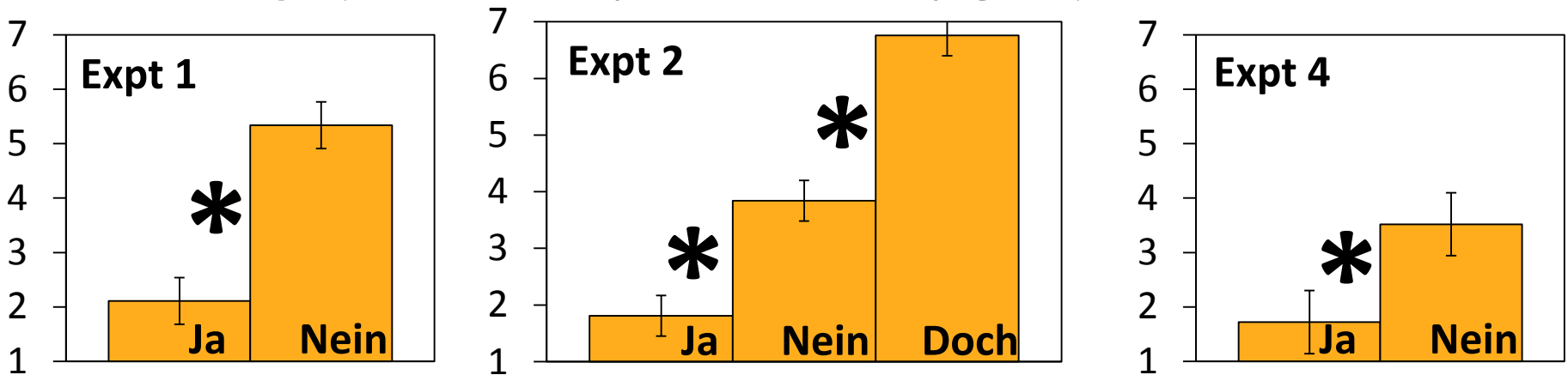
Result preview: **no** significant interaction effects involving the factor CONTEXT! (contra predictions derived from saliency account)

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

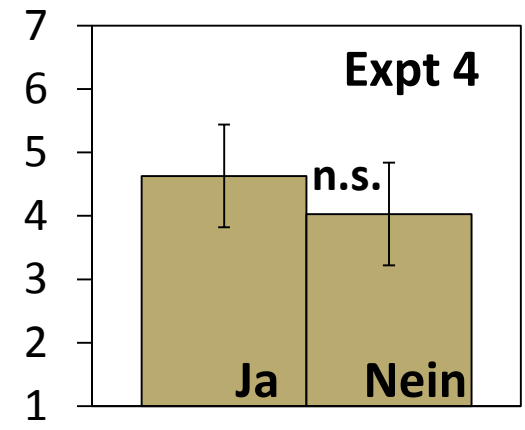
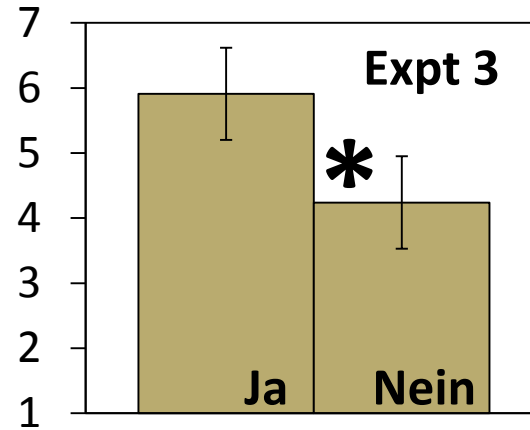
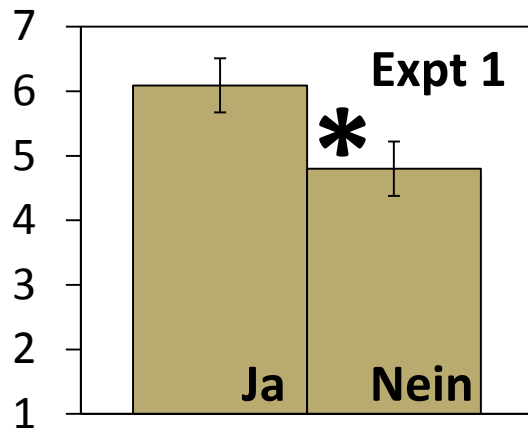
Expt 2 (follow-up phrase: *Ja/Nein/Doch, he has sown the lawn already*)
highest ratings for *doch*; still significant difference btwn *ja* and *nein*

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*

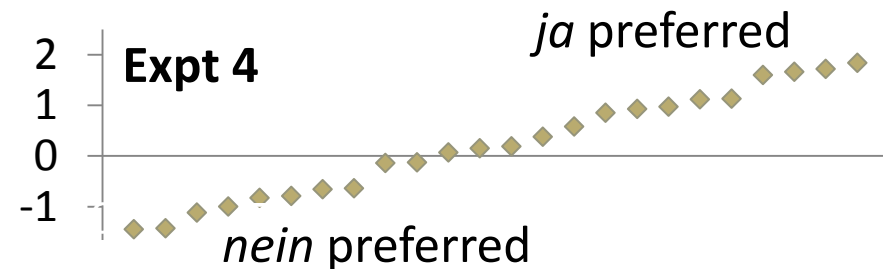
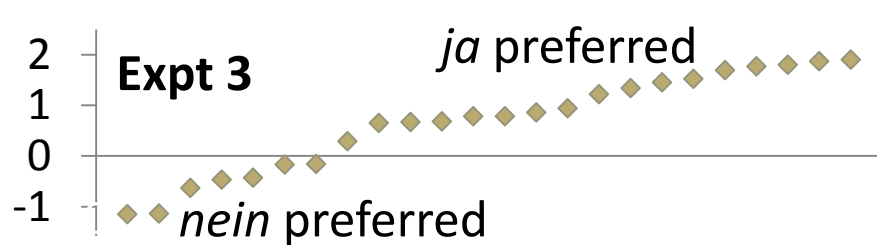
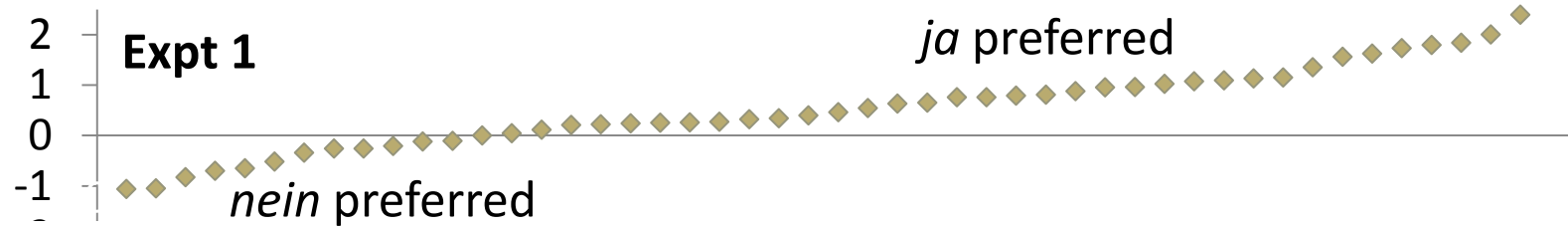
Expt 4 (**bare particle** responses to **questions**)

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

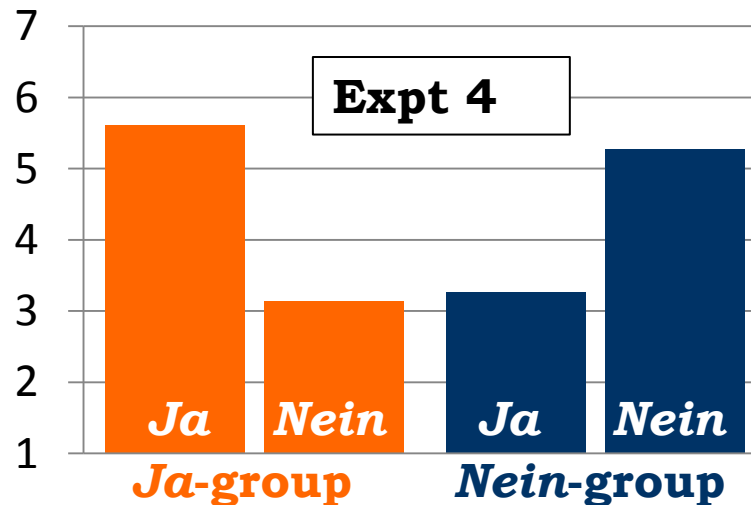
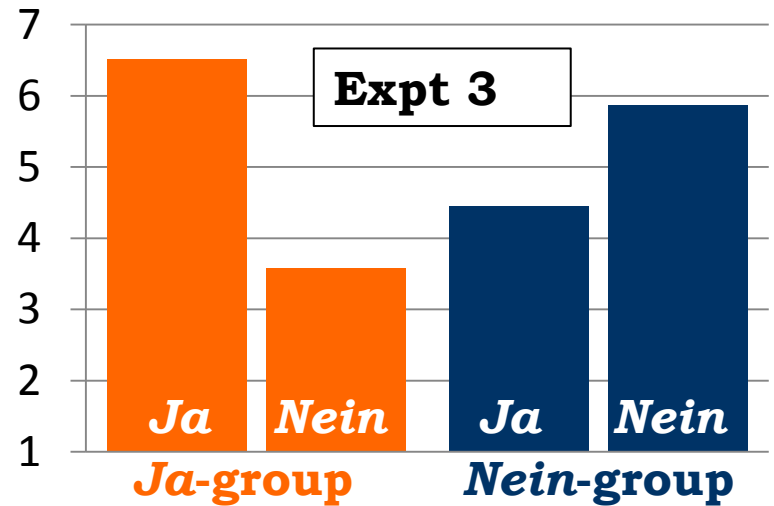
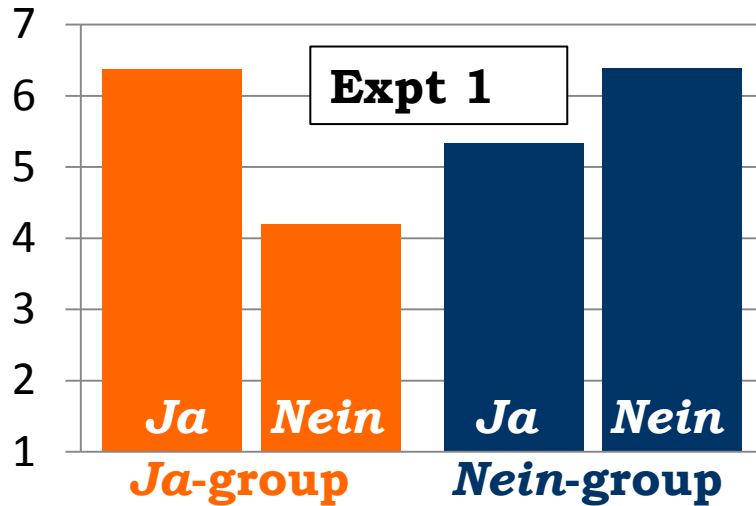
Most participants: fairly large difference score, indicating preference for either *ja* or *nein*

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

Ja-group and Nein-group

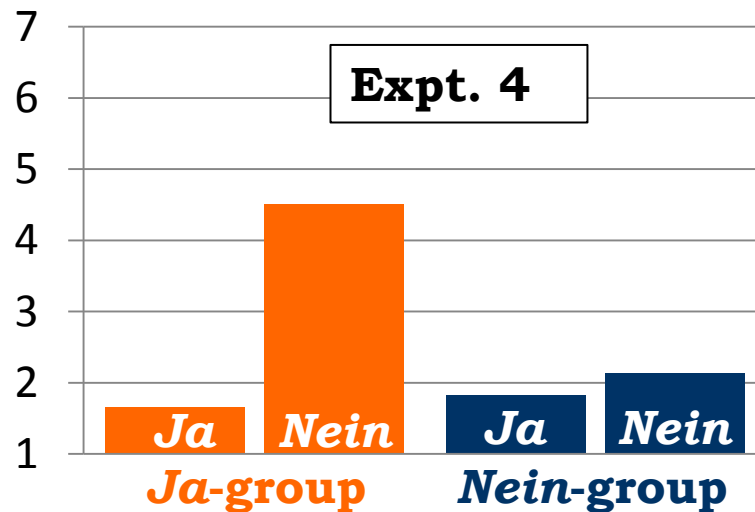
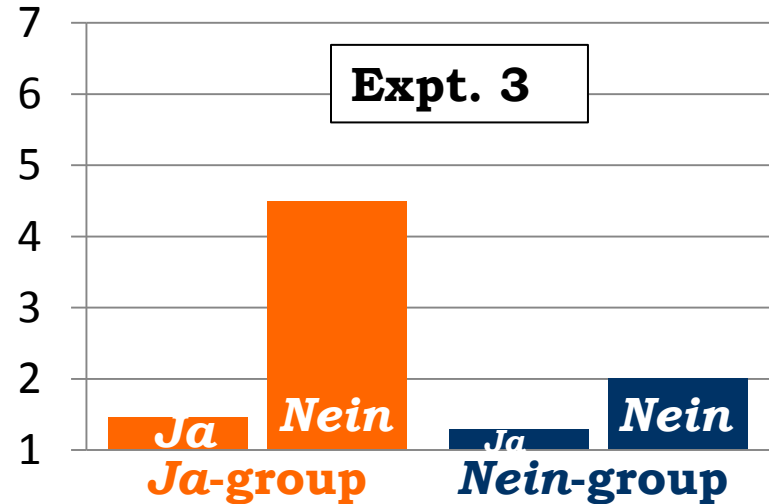
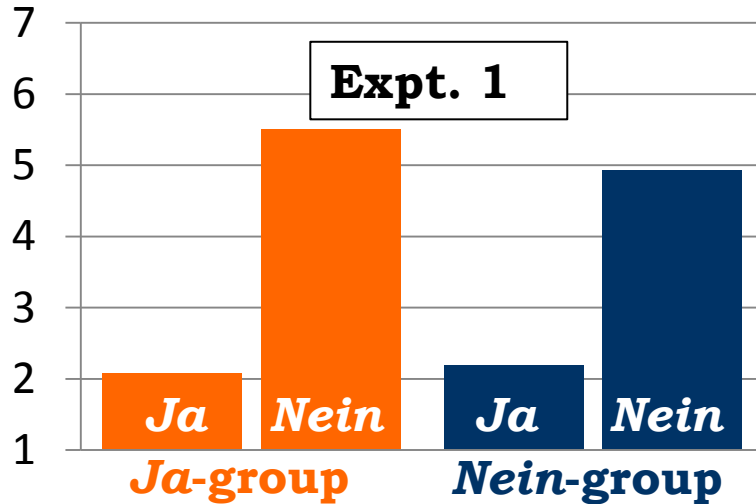
Two groups, differing in preference pattern for affirming responses
Ja-group: $ja > nein$ | **Nein-group**: $nein > ja$

Ja-group: majority ($\approx 70\%$ in Expt. 1 and 3, $\approx 60\%$ 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 ([+] [-])

	Ja-group	Nein-group
[AGREE,-]	<i>ja</i> ([AGREE])	<i>nein</i> ([-])
[REVERSE,+]	<i>doch</i> <i>nein</i> ([REVERSE])	<i>doch</i> <i>ja</i> ([+])
OR:	both groups: only <i>doch</i> can realize [REVERSE,+]	

Two groups in feature model

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 ([+] [-])

	Ja-group	Nein-group
[AGREE,-]	<i>ja</i> ([AGREE])	<i>nein</i> ([-])
[REVERSE,+]	<i>doch</i> <i>nein</i> ([REVERSE])	<i>doch</i> <i>ja</i> ([+])
OR:	both groups: only <i>doch</i> 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: \bar{p}_{DR} and p_{DR}
- (3) \bar{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: \bar{p}_{DR} more salient than p_{DR}

Nein-group: \bar{p}_{DR} and p_{DR} do not differ in saliency

Assumptions (1) and (2) maintained

revised: *doch* picks up \bar{p}_{DR} (rather than p_{DR})

Ja-group in saliency account

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

\bar{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 \bar{p}_{DR}

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

Doch (=he does) *doch* picks up and asserts negation of \bar{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: \bar{p}_{DR} and p_{DR} do not differ in saliency

Thus, *ja* and *nein* are ambiguous (reference to \bar{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 \bar{p}_{DR} involves double negation; only picking up \bar{p}_{DR} is avoided but not picking up p_{DR}

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

B: ~~*Ja* (=he doesn't) *ja* picks up and asserts \bar{p}_{DR}~~

~~*Ja* (=he does) *ja* picks up and asserts p_{DR}~~

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

Nein (=he doesn't) *nein* picks up and asserts negation of p_{DR}

Doch (=he does) *doch* picks up and asserts negation of \bar{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