Particle responses to negated assertions: Preference patterns for German *ja* and *nein* *

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Abstract

The present study focusses on German polarity particles as responses to negative assertions. In such responses, the German response particles *ja* and *nein* are not used complementarily – similarly to their roughly corresponding English counterparts *yes* and *no*. Rather it seems that both *ja* and *nein* can be used to affirm a negative antecedent (e.g. A: *Jim doesn't snore.* B: *Ja./Nein.* (=He doesn't snore)). In a series of acceptability judgement experiments, we tested the predictions of two recent theoretical accounts (Krifka 2013 and Roelofsen and Farkas 2015). For affirming responses to negative assertions, both accounts predict a default preference for *nein* over *ja*. However, our experimental results revealed two subgroups of participants. A majority of approx. 70% showed a preference for *ja* over *nein*. The other subgroup showed a preference for *nein* over *ja*. To explain this finding, we consider modified versions of both accounts.

1 Introduction

The use and interpretation of response particles such as English *yes* and *no* is clear-cut only in responses to non-negative antecedents. Matters are different with negative antecedents. It has been claimed that both *yes* and *no* can be used in affirming responses to negative assertions, see (1). Kramer and Rawlins have called this phenomenon 'negative neutralization' (Kramer and Rawlins 2011), as the meaning of *yes* and *no* seems to be collapsed.

(1) A John doesn't snore.
B.i No, he doesn't. B.ii Yes, he doesn't.

However, experimental evidence suggests that there is a preference for *no* over *yes* in responses to negative assertions. Brasoveanu, Farkas and Roelofsen (2013) have shown that *no* is preferred over *yes* in affirming responses to negative assertions. Kramer and Rawlins (2012) have shown the same preferences for affirming responses to negative questions.

The German particles *ja* and *nein* also are complementary in responses to non-negative antecedents and they display an unclarity in responses to negative antecedents (see (2)). It is assumed that both *ja* and *nein* can be used in affirming responses to antecedents with sentential negation (Blühdorn 2012: 386). Unlike English, however, German has a third, specialized response particle, in addition to *ja* and *nein*: *doch*. This particle is used in responses to negative antecedents and indicates that a previous assertion is not true (see (2)).[1]

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[1]In some situations, *doch* can also be used in response to a non-negative assertion or question. For details, see Karagjosova (2006).

(2) A Jim schnarcht nicht.
'Jim doesn't snore.'
B.i Ja./Nein. (= He doesn't snore.)
B.ii Doch. (= He does snore.)

Up to now, there have not been any experimental studies investigating the German response particle system. There are several recent theoretical accounts of response particle systems, e.g. Holmberg (2013), Kramer and Rawlins (2012), Krifka (2013) and Roelofsen and Farkas (2015), two of which make predictions for preference patterns of the German response particles with competing analyses: Krifka's (2013) anaphor account and Roelofsen & Farkas' (2015) syntactic-semantic feature model. The present paper presents a series of experiments juxtaposing these two accounts.

2 Theoretical Background

2.1 Anaphor account (Krifka 2013)

Krifka argues that polarity particles are anaphors that refer back to salient propositions in the context. He proposes that *ja* targets a proposition and asserts it and *nein* targets a proposition and asserts its negation. Furthermore, Krifka argues that antecedents containing sentential negation introduce two propositional discourse referents (propDR): the negated proposition ($\bar{p}_{\text{DR}}$) and its non-negated counterpart (p_{DR}), see (3).

(3) $[\![$ [Jim [$_{\bar{p}_{\text{DR}}}$ t_{Jim} doesn't [$_{p_{\text{DR}}}$ t_{Jim} snore]]]$]\!] = \neg$ snore(jim)
$\bar{p}_{\text{DR}}$ (negated propDR): $\neg$ snore(jim)
p_{DR} (positive propDR): snore(jim)

Support for this assumption comes from other propositional anaphors, e.g. *that*. In response to a negative assertion like the one in (4), B can use *that* to refer to the negated (B.i) or the non-negated part (B.ii) of A's utterance.

(4) A Two plus two isn't five. B.i Everyone knows that$_{\bar{p}_{\text{DR}}}$.
[¬[two plus two is five]$_{p_{\text{DR}}}$]$_{\bar{p}_{\text{DR}}}$ B.ii That$_{p_{\text{DR}}}$ would be a contradiction. (Krifka 2013)

Crucially, according to Krifka, the propDRs differ in saliency. In a neutral context (the default), the non-negated proposition is assumed to be salient because negated propositions are usually uttered in contexts where the non-negated proposition is under discussion and thus is salient already. Krifka suggests that speakers prefer reference to the salient propDR since salient discourse referents in general are targeted more readily by anaphors than non-salient discourse referents (e.g. Gundel et al. 1993). Thus, he predicts that for affirming responses to negative antecedents, *nein* should be preferred over *ja* as a default: *nein* targets the salient p_{DR} and asserts its negation; *ja* targets the non-salient $\bar{p}_{\text{DR}}$ and asserts it. However, the preference pattern should differ from the default in contexts in which the $\bar{p}_{\text{DR}}$ (rather than p_{DR}) is salient, e.g. when the antecedent is preceded by a negative question as shown in Krifka's example for English in (5).

(5) A Which of the mountains on this list did Reinhold Messner not climb?
B Well.. he did not climb Cotopaxí in Ecuador.
A Yes./No. (Krifka 2013:14)

For (5) Krifka assumes that the negative question preceding the antecedent renders the $\bar{p}_{\text{DR}}$ salient. This should result in a preference for *ja* over *nein*, because *ja* targets the salient $\bar{p}_{\text{DR}}$ whereas *nein* targets the non-salient p_{DR}.

For *doch*, i.e. the specialized particle for rejecting a negative antecedent, Krifka assumes that it comes with the presupposition that there are two salient propDRs and one is the negation of the other; *doch* targets and asserts p_{DR}. When its presupposition is satisfied, *doch* blocks the use of *yes* which could also reject a negative antecedent by targeting and asserting p_{DR}.

To sum up, Krifka predicts that for affirming negated propositions in default contexts *nein* is preferred over *ja*, due to the salience of p_{DR} that *nein* targets and negates. This pattern is predicted to be reversed in negative contexts. For rejecting responses to negative antecedents, Krifka predicts that *doch* blocks *ja*, whereas *nein* is not blocked by *doch*, although it is dispreferred.

2.2 Feature account (Roelofsen and Farkas 2015)

Roelofsen and Farkas (2015, henceforth R&F) propose a semantic-syntactic feature account, in which polarity particles encode absolute and relative polarity features. The particles head a polarity phrase and take a (possibly elided) response clause as an argument (e.g. *he does(n't)* in (7)). The absolute features, [+] and [−], pertain to the polarity of the response clause. [+] presupposes that the response clause polarity is positive, [−] presupposes that it is negative. The relative features, [AGREE] and [REVERSE], encode the relation between the response clause and its antecedent. [AGREE] presupposes that the polarity of the response clause agrees with the polarity of the antecedent whereas [REVERSE] presupposes that the response clause reverses the polarity of the antecedent.

For the English particles *yes* and *no*, R&F propose the following realization potentials:

(6) *Realization potential of English particles*
   a. [AGREE] and [+] are realized by *yes*
   b. [REVERSE] and [−] are realized by *no* (R&F 2015)

Thus, [AGREE,+] must be realized by *yes* and [REVERSE,−] by *no*. These are the two complementary uses of *yes* and *no* in response to non-negative assertions. However, both particles are possible candidates in responding to a negative assertion, or in terms of R&F, for the realization of [AGREE,−] or [REVERSE,+]. This is illustrated in (7).

(7) A John doesn't snore.
   B.i Yes/No, he doesn't. [AGREE,−] B.ii Yes/No, he does. [REVERSE,+]

German is like English insofar as *ja* can realize [AGREE] and [+], whereas *nein* can realize [REVERSE] and [−], see (8). The specialized particle *doch* realizes the feature combination [REVERSE,+].

(8) *Realization potential of German particles*
   a. [AGREE] and [+] are realized by *ja*
   b. [REVERSE] and [−] are realized by *nein*
   c. [REVERSE,+] is realized by *doch*

The polarity features differ regarding their markedness. R&F assume that the more marked a feature is, the higher its realization need. Of the absolute features, [−] is more marked than [+]. Of the relative features, [REVERSE] is more marked than [AGREE]. [AGREE] and

[+] form a natural class, as do [REVERSE] and [−]; these classes correspond to the use of *ja* and *nein* in non-negative contexts. Furthermore, R&F note that [+] is contrastive when it co-occurs with [REVERSE]; this makes [REVERSE,+], which is realized by *doch*, a highly marked feature combination. Due to the higher realization need of marked particles, R&F predict that in affirming responses to negative assertions ([AGREE,−]), German speakers prefer *nein* over *ja* because *nein* realizes the marked feature [−] and *ja* the unmarked feature [AGREE]. For rejecting responses to negative assertions ([REVERSE,+]), R&F predict that only *doch* can be used. The availability of this specialized particle blocks both *ja* and *nein*.

Summarizing, R&F predict that in affirming negative antecedents *nein* is preferred over *ja*, due to the markedness of [−]. In rejecting negative antecedents R&F expect *doch* to be preferred over both *ja* and *nein*, due to the markedness of the feature combination it realizes. On this account, no effect of context is expected.

3 Experimental study

The goal of the present study was to gain insight into the preference patterns for German response particles. For affirming responses, Krifka predicts a default preference for *nein* over *ja* and a reversed preference pattern for contexts in which $\bar{p}_{\text{DR}}$ is salient. In contrast, R&F predict a general preference for *nein* over *ja* without contextual modulation. For rejecting responses, Krifka predicts a preference for *nein* over *ja*, based on the assumption that *ja* is blocked due to the presence of *doch* in the system, whereas *nein* is not blocked but dispreferred. R&F predict no difference in (dis)preference as they assume that both *ja* and *nein* are blocked by *doch*. We tested these predictions in a series of acceptability-judgement experiments. Participants were presented with short dialogues, in which one speaker made a negative assertion, which the other responded to with a response particle. This response was rated by the participants. Every dialogue was introduced by a scene-setting passage in which the context was manipulated to render either p_{DR} or $\bar{p}_{\text{DR}}$ salient, in order to reveal potential context effects.

3.1 Experiment 1

3.1.1 Method

Particpants. 48 students of Humboldt-Universität zu Berlin participated in the experiment. All participants were native speakers of German. They received payment for their participation.

Materials. There were 48 experimental items and 16 fillers. The dialogues in the experimental items were preceded by a scene-setting passage, which introduced two interlocutors and specified the dialogue's context, i.e. what the two interlocutors were talking about. The dialogue's context was conveyed by an embedded question with either positive or negative polarity, intended to make p_{DR} or $\bar{p}_{\text{DR}}$ salient. The dialogue consisted in a negative assertion and a response to it. The response comprised a *ja* or *nein* and a follow-up phrase, which made clear whether the antecedent assertion was rejected (positive response clause polarity) or affirmed (negative response clause polarity). Table 1 shows an example item, translated to English. The fillers were similar to the experimental items, apart from having a positive antecedent assertion.
All negative versions of the context sentence, antecedent, and response clause contained the adverb *noch* ('yet'). All positive versions contained the adverb *schon* ('already'). To encourage the participants to read the scene-setting passages and dialogues carefully, each item was followed by a statement, which participants had to verify and which pertained to the content of the scene-setting passage or dialogue.

Table 1: Sample of the experimental items in Experiment 1, translated from German

Setting:	A couple of weeks ago Hildegard and Ludwig asked their gardener to redesign the back garden of their holiday home. Now they are chatting about
Positive Context: salient p_{DR}	what the gardener has done already./
Negative Context: salient $\bar{p}_{\text{DR}}$	what the gardener hasn't done yet.
Antecedent:	The gardener hasn't sown the lawn yet.
Rejecting response:	Yes/No, he has sown the lawn already./
Affirming response:	Yes/No, he hasn't sown the lawn yet.

Design and Procedure. Experiment 1 had a 2x2x2 within-subject design with the factors CONTEXT POLARITY (positive/negative), RESPONSE PARTICLE (*ja*/*nein*), and RESPONSE CLAUSE POLARITY (positive/negative). The 48 experimental items were assigned to eight sets. Sets and conditions were counterbalanced across participants. Experimental and filler items were presented to the participants in six different orders. Participants had to rate the naturalness and suitability of the *ja*/*nein*-response with regard to the context and dialogue on a scale from 1 ('very bad') to 7 ('very good').

3.1.2 Results and Discussion

All analyses reported in this paper were conducted by linear mixed-effects modelling with backward model selection. The final model for the data of Experiment 1 included a random intercept for participants and a random participant slope of RESPONSE POLARITY, RESPONSE PARTICLE, and their interaction. It indicated significant effects of CONTEXT (b=0.20, SE=0.04, t=4.65), of RESPONSE POLARITY (b=1.72, SE=0.17, t=9.96), and of RESPONSE PARTICLE (b=-0.97, SE=0.18, t=-5.49). These effects were qualified by significant interactions of CONTEXT with RESPONSE POLARITY (b=0.30, SE=0.08, t=3.42), and of RESPONSE POLARITY with RESPONSE PARTICLE (b=4.52, SE=0.49, t=9.32). To unpack the interactions separate analyses for the two RESPONSE POLARITY conditions were conducted. The model for the 'positive response clause' conditions (i.e. rejecting responses) did not reveal a significant effect of CONTEXT (b=0.05, SE=0.06, t=0.92). The effect of RESPONSE PARTICLE was significant (b=-3.23, SE=0.30, t=-10.70). As displayed in Table 2, *ja* received lower ratings than *nein*. The model for the 'negative response clause' conditions (i.e. affirming responses) indicated a significant effect of CONTEXT (b=0.34, SE=0.06, t=5.44); ratings were lower in the 'positive context' conditions than in the 'negative context' conditions (see Table 2). Moreover, there was a significant effect of RESPONSE PARTICLE (b=1.29, SE=0.30, t=4.34) with higher ratings for *ja* than for *nein* (see Table 2).

Table 2: Mean Ratings in Experiment 1 (rating scale from 1 ('very bad') to 7 ('very good'))

	Positive Context			**Negative Context**		
Response Polarity	***ja***	***nein***	**95% *CI***	***ja***	***nein***	**95% *CI***
Positive (rejecting)	2.16	5.24	±0.45	2.06	5.44	±0.42
Negative (affirming)	5.91	4.30	±0.43	6.26	4.96	±0.43

Note. The 95% *CIs* are within-subject confidence intervals (Masson and Loftus 2003) associated with the particle effect in the respective context and response polarity condition.

The results for rejecting responses, with low ratings for *ja* and significantly higher ratings for *nein*, suggest that only *ja* but not *nein* is blocked by *doch*. A further experiment, including *doch* as an additional level of the factor RESPONSE PARTICLE, yielded significantly higher ratings for *doch* (M=6.76) compared with *nein* (M=3.84) and *ja* (M=1.81), and replicated the significant difference between *nein* and *ja*, thereby suggesting that the finding of Experiment 1 did not rest upon the absence of *doch* in the experimental situation. The results for affirming responses were neither consistent with Krifka's predictions nor with those by R&F. Against both accounts, the ratings indicate an overall preference for *ja* over *nein* rather than for *nein* over *ja*, and against Krifka's account, the preference pattern was not modulated by the context manipulation.

3.2 Experiment 2

Experiment 2 investigated if the unpredicted results found for the affirming conditions of Experiment 1 could be replicated for bare particle responses.

3.2.1 Method

Participants. 26 students of Humboldt-Universität zu Berlin participated in this experiment. The data of two participants were excluded from analysis as they did not perform significantly better than chance in the verification task or did not follow the instructions. As in Experiment 1, participants received a payment for participating.

Materials. The responses in Experiment 2 consisted of bare particles only. To make clear whether a bare *ja* or *nein* should be taken as an affirming response, the items contained information on the knowledge of the answering person in the scene-setting passage. For the experimental items, this information indicated that the knowledge of the second person was consistent with the negative utterance by the first person. For the example item of Experiment 1, shown in Table 1, the additional information in Experiment 2 would be *In the morning, Ludwig ran into the gardener, who told him that he can only sow the lawn in a couple of days, due to the weather*. A further modification of the material was motivated by the overall lower ratings in the 'positive context' conditions for the affirming responses in Experiment 1, which may suggest that the dialogues in the 'positive context' conditions were generally perceived as less coherent. In Experiment 2, the positive context (which had been intended to induce a salient p_{DR}) was replaced with a 'neutral' context (e.g. for the sample item of Experiment 1: *They are talking about the gardener and the redesigning of their garden*), in which the p_{DR} was assumed to be salient by default. In total, the materials comprised 24 experimental items and 40 fillers. Sixteen fillers had a positive antecedent. The remaining 24 fillers had a negative antecedent followed by a rejecting response.

Design & Procedure. Experiment 1 employed a 2x2 within-subject design, with the factors CONTEXT (neutral/negative) and RESPONSE PARTICLE (*ja*/*nein*). The procedure was the same as in Experiment 1.

3.2.2 Results and Discussion

The final model for the data of Experiment 2 included a random intercept for participants and a random participant slope of RESPONSE PARTICLE. It revealed a significant effect of RESPONSE PARTICLE (b=1.67, SE=0.48, t=3.45). As Table 3 shows, *ja* received higher ratings than *nein*. Model comparison neither yielded a better fit for a model including the factor CONTEXT nor for a model including the interaction of RESPONSE PARTICLE and CONTEXT.

The results replicate the unexpected finding for the affirming responses of Experiment 1 and extend it to bare particles. Inconsistent with both R&F and Krifka, the ratings obtained in Experiment 2 suggest that bare *ja* is preferred over bare *nein* without contextual modulation.

Table 3: Mean Ratings in Experiment 2 (rating scale from 1 ('very bad') to 7 ('very good'))

Neutral Context			**Negative Context**		
ja	***nein***	**95% *CI***	***ja***	***nein***	**95% *CI***
5.83	4.31	±0.71	5.99	4.17	±0.75

Note. The 95% *CIs* are within-subject confidence intervals (Masson and Loftus 2003) associated with the particle effect in the respective context condition.

4 General Discussion

Our study aimed at investigating preference patterns for the German particles *ja* and *nein* in responses to negative assertions. For rejecting responses, the results from two experiments (Experiment 1 and the additional experiment including *doch*) indicate that *nein* is preferred over *ja*, suggesting that *ja* but not *nein* is blocked by *doch*. For affirming responses, the results of Experiment 1 and 2 revealed an overall preference of *ja* over *nein* without contextual modulation. This finding is inconsistent with the predictions of both Krifka and R&F.

However, a closer data inspection, i.e. comparing each participants mean rating for *ja* with the mean rating for *nein*, revealed differences among participants. A majority of approximately 70% of the participants of Experiment 1 and 2 showed the unpredicted pattern of a higher mean rating for *ja* compared with *nein*. Approximately 30% of the participants displayed a different pattern, with a higher mean rating for *nein* compared with *ja* for all but one participants in this subgroup. The two figures below illustrate the individual differences between the ratings for *ja* and *nein*; they show the difference score per participant (calculated by subtracting the mean rating in the *nein* condition from the mean rating in the *ja* condition after z-value transformation per participant). A positive difference score indicates a higher mean rating for *ja* compared with *nein* and a negative difference score indicates the reverse pattern.

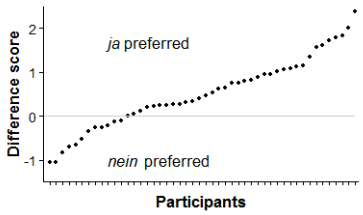

Figure 1: Difference scores between ratings for *ja* and *nein* for each participant in Expt. 1

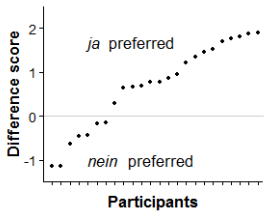

Figure 2: Difference scores between ratings for *ja* and *nein* for each participant in Expt. 2

As can be seen from Figures 1 and 2, both the positive and negative difference scores have some variability.[2] Yet, most of the participants have a fairly large difference score, indicating that they have a clear preference for either *ja* or *nein*. Thus, these participants fall into two subgroups: a *ja*-group and a *nein*-group. Remarkably, the two groups also differ in the ratings

[2]For some participants, the difference score was close to (or equal to) zero. This could reflect a lack of a pronounced preference for either of the two response particles. However, it should be kept in mind that the difference scores result from acceptability judgments rather than from production data. When judging acceptability, participants might allow for variation that they are used to in commonplace conversational settings, like other speakers having different preferences. Hence, the difference scores obtained with the present method may underestimate preference strength. Indeed, in a pilot production study, each participant showed a clear preference, with the majority preferring *ja* and a notable minority preferring *nein* in affirming responses to negative antecedents, similar to the main finding of the present experiments.

for *nein* as a rejecting response. Overall, participants with a preference for *ja* as an affirming response rated rejecting responses with *nein* higher than did participants with a preference for *nein* as an affirming response (M=5.00 vs 3.47), with the difference being especially pronounced with bare particles (M=4.49 vs 2.01). This suggests that *nein* may be a suitable alternative to *doch* for the *ja*-group but not for the *nein*-group.

In the following, we will discuss how the two groups can be accounted for in the frameworks of R&F and Krifka.

Accounting for the two groups in R&F's framework. One obvious way to account for the two groups in the framework of R&F it is to assume that the *ja*-group and *nein*-group differ in the feature realization potential of *ja* and *nein*. The *ja*-group prefers *ja* over *nein* in affirming responses to negated antecedents. Participants in this group seem to apply a truth-based response strategy (Jones 1999), with *ja* signaling the truth and *nein* the falsity of the antecedent. This could be captured by the two relative polarity features [AGREE] and [REVERSE]. Thus, in the *ja*-group *ja* realizes [AGREE] and *nein* realizes [REVERSE] (see Table 4). In contrast, participants in the *nein*-group have a preference of *nein* over *ja* in affirming responses to negated antecedents. The *nein*-group seems to apply a polarity-based strategy (Jones 1999), with *ja* signaling that the response clause has positive polarity and *nein* signaling a negative response clause polarity. Hence, in the *nein*-group *ja* realizes the absolute polarity feature [+] and *nein* realizes [−] (see Table 4).

Table 4: Realization potentials of *ja*, *nein* and *doch* for the two groups

Particle	***ja*-group**	***nein*-group**
ja	[AGREE]	[+]
nein	[REVERSE]	[−]
doch	[REVERSE,+]	[REVERSE,+]

Due to the presence of a third form, the specialized particle *doch*, the response systems for the two groups can neither be purely truth-based nor polarity-based. Thus, for both groups *doch* realizes the feature combination [REVERSE,+]. However, there is a general issue with this account. Upon closer scrutiny, it turns out that the absolute polarity features are problematic because they only impose a presupposition on the polarity of the response clause, but not its meaning: roughly, the response clause must denote a proposition that is 'highlighted', i.e. a propositional discourse referent being introduced by a preceding utterance (R&F). This means that there is no restriction on the meaning of the response clause in the case of absolute polarity features. Hence, a bare *no* in response to a positive assertion like *Jim snores* could be taken to mean e.g. *No, Mary doesn't know*, if the proposition *Mary doesn't know* was part of the context. To fix this problem, one could define the absolute polarity features with an additional condition such that the proposition p denoted by the response clause must either be the complement of, or semantically identical to a salient proposition q in the context. Yet, such a step would render the absolute polarity features relative.

Accounting for the two groups in Krifka's framework. Recall that the core of Krifka's proposal is that negated propositions introduce two propDRs in the discourse: p_{DR} and $\bar{p}_{\text{DR}}$. Furthermore, *ja* asserts the propDR it targets and *nein* asserts the negation of the propDR it targets. In this framework, the two groups can be accounted for by assuming that they differ in which propDR *ja* and *nein* target in the case of a negative antecedent, i.e. when both the p_{DR} and $\bar{p}_{\text{DR}}$ are available: we propose that the *ja*-group prefers $\bar{p}_{\text{DR}}$, whereas for the *nein*-group both p_{DR} and $\bar{p}_{\text{DR}}$ are equally good candidates. The difference to Krifka's original proposal is

that there is no default preference to target p_{DR} and no context modulation.

***Ja*-group.** For the *ja*-group, we assume that $\bar{p}_{\text{DR}}$ is more salient than p_{DR}. This may be due to $\bar{p}_{\text{DR}}$ being introduced by a non-embedded constituent, whereas p_{DR} is introduced by an embedded constituent. Evidence for acceptability differences between embedded and non-embedded material stems from a study by Gordon et al. (1999). This study indicates that after processing utterances like the one in (9), the DR of *Bill's aunt* is more easily accessible than the DR of *Bill*.[3]

(9) Bill's aunt owns a lake house.

As a result of the preference for targeting $\bar{p}_{\text{DR}}$, the particle *ja* unambiguously asserts $\bar{p}_{\text{DR}}$ and *nein* asserts the negation of $\bar{p}_{\text{DR}}$, see Table 5. We will deal with the use of *doch* after discussing the *nein*-group.

Table 5: Meaning of the response particles for negative antecedents in the *ja*-group

Particle	Reference	Meaning	Presupposition
ja	$\bar{p}_{\text{DR}}$	$\bar{p}_{\text{DR}}$	
nein	$\bar{p}_{\text{DR}}$	$\neg\bar{p}_{\text{DR}} \equiv p$	
doch	$\bar{p}_{\text{DR}}$	$\neg\bar{p}_{\text{DR}} \equiv p$	$\bar{p}_{\text{DR}}$ is available

***Nein*-group.** For this group, we assume that both available propDRs, p_{DR} and $\bar{p}_{\text{DR}}$, do not differ in saliency. As a consequence, the use of *ja* in responses to negative assertions is ambiguous, because it can target and assert both p_{DR} and $\bar{p}_{\text{DR}}$. We suggest that the *nein*-group therefore avoids the use of *ja*, see Table 6. As for *nein*, its use would in principle be ambiguous as well: *nein* can assert either the negation of p_{DR} or of $\bar{p}_{\text{DR}}$. However, these two options are cognitively asymmetrical, since the latter one involves double negation. Therefore, we assume that speakers of the *nein*-group prefer targeting p_{DR}, as shown in Table 6.

Table 6: Meaning of the response particles for negative antecedents in the *nein*-group

Particle	Reference	Meaning	Presupposition	Use
ja	p_{DR}	p_{DR}		Avoid
	$\bar{p}_{\text{DR}}$	$\bar{p}_{\text{DR}}$		Avoid
nein	p_{DR}	$\neg p_{\text{DR}}$		✓
	$\bar{p}_{\text{DR}}$	$\neg\bar{p}_{\text{DR}} \equiv p$		Avoid
doch	$\bar{p}_{\text{DR}}$	$\neg\bar{p}_{\text{DR}} \equiv p$	$\bar{p}_{\text{DR}}$ is available	✓

Regarding the meaning of *doch*, we assume that the two groups do not differ. We propose that *doch* targets $\bar{p}_{\text{DR}}$ and asserts its negation; thus, *doch* presupposes that $\bar{p}_{\text{DR}}$ is available. For rejecting negated propositions, *doch* is favored over other particles with the same meaning, due to Maximize Presupposition (Heim 1991). Thus, for the *ja*-group *nein* is dispreferred to *doch*, in rejecting responses to negative antecedents. However, as our findings suggest, speakers from this group judge *nein* as quite acceptable in such conditions.

Conclusion. The main result of our experimental study is the finding of two subgroups of participants, differing in the preference patterns for the German response particles *ja* and *nein* as affirming responses to negative assertions. To account for the two groups we discussed

[3] We thank Massimo Poesio for pointing out this reference.

possible modifications of the R&F and Krifka frameworks. Regarding the R&F framework, there is a theory-internal issue with the notion of absolute polarity features, as outline before. As for the Krifka framework, it is an empirical task to evaluate the validity of the modified assumptions on saliency, that are proposed in this paper.

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