# The role of prosody for the interpretation of rhetorical questions in German

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## Background & Motivation:

- **Information-seeking questions** (ISQs) elicit new information with the goal of closing a knowledge gap. (e.g., Groenendijk & Stokhof 1984)
- **Rhetorical questions** (RQs) imply answers that are already known to all interlocutors. (Caponigro & Sprouse 2007)
- Wochner et al. (2015): **breathy voice quality** and **nuclear L*+H accent** as characteristics in the production of German *wh*-RQs.

(see also Neitsch et al. 2017)

- **Particles** have different functions in questions:
  - ***schon*** and ***auch*** are rhetorically connotated (Meibauer 1986)
    - *Wer schreibt* **schon** *gerne Prüfungen?*
      *('Who likes* PRT *to take exams?')*
    - *Was sollten wir* **auch** *anderes tun?*
      *('What else should we* PRT *do?')*
  - ***denn*** can occur in both ISQs and RQs (Thurmair 1991)
    - **RQ:** *Wer geht* **denn** *im Sommer Skifahren?*
      *('Who goes* PRT *skiing in the summer?')*
    - **ISQ:** *Wer geht* **denn** *heute zum Grillfest?*
      *('Who is going* PRT *to the barbecue today?*

**but** influence of *denn* on question interpretation has not yet been empirically tested

## Research Questions:

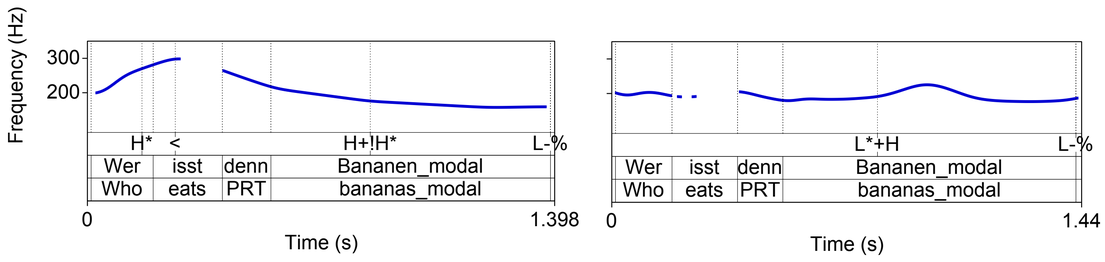
- **Experiment 1:** Are *voice quality* and *nuclear pitch accent type* relevant perceptual prosodic cues for the interpretation of German *wh*-questions as rhetorical or information-seeking when they are presented out of linguistic context?
- **Experiment 2:** Does the modal particle *denn* influence the interpretation of these prosodic cues?

## Forced-Choice Perception Experiments: *Materials & Methods*

### *Experiment 1:*

- 32 different *wh*-questions, pragmatically ambiguous between RQ and ISQ: *Wer* VERB *denn* OBJEKT? '*Who* VERB PRT OBJECT?'
- all questions were recorded in four experimental conditions:

| **accent type** | H+!H* | | L*+H | |
|---|---|---|---|---|
| **voice quality** | modal | breathy | modal | breathy |




### *Experiment 2:*

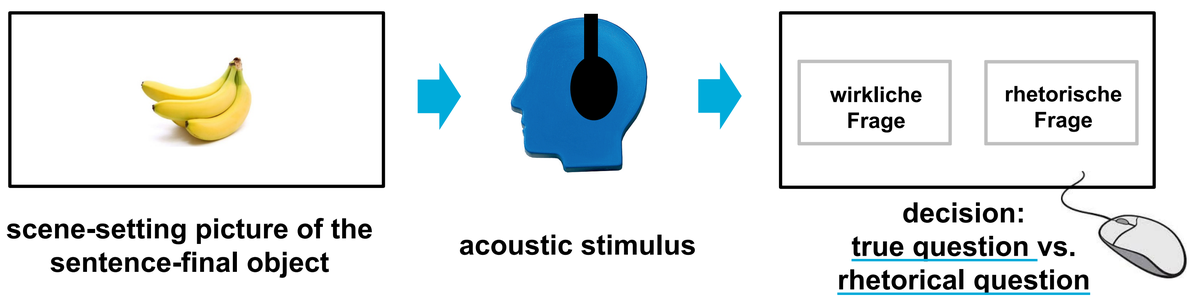
- identical to Experiment 1 **but** particle *denn* was cut out of the stimuli

### *Participants:*

- 48 monolingual native German speakers, 24 per experiment (**Exp.1**: Ø = 23.7 years, 19 female; **Exp. 2**: Ø = 22.8 years, 17 female)

### *Procedure:*

- listeners decided whether the *wh*-question played after a picture providing non-linguistic context was an ISQ or RQ
- *nuclear accent type* and *voice quality* (breathy vs. modal) were presented within-subjects, presence or absence of *particle* between-subjects

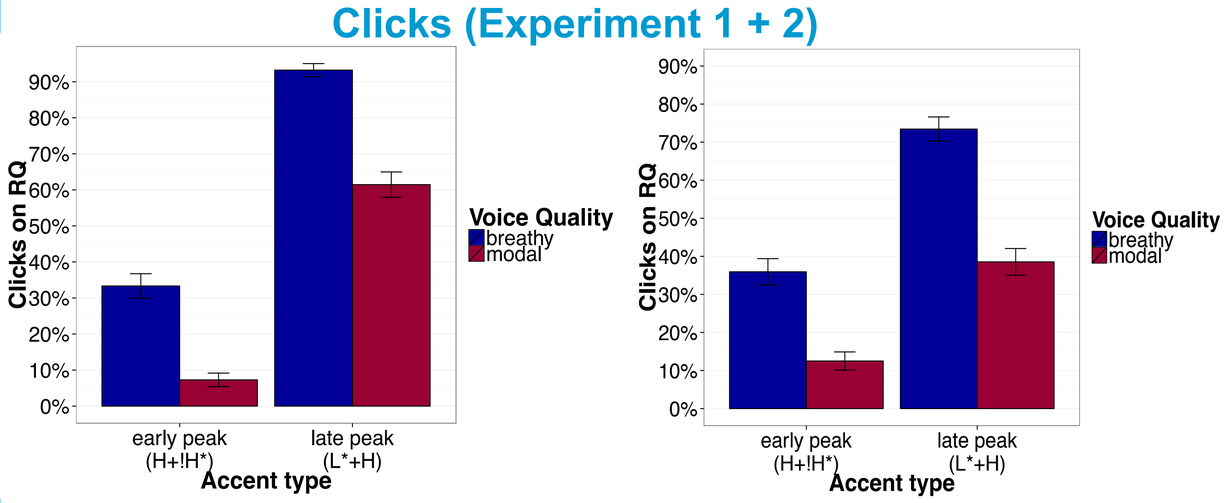



**scene-setting picture of the sentence-final object** — **acoustic stimulus** — **decision: true question vs. rhetorical question**

## *Results*:

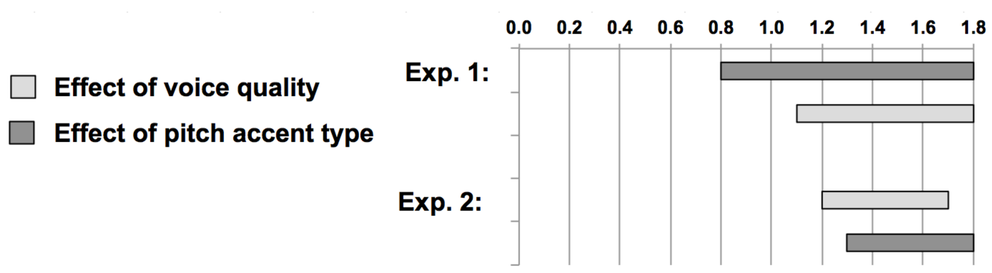
- *RQ interpretation:* most frequent when *wh*-questions were produced with breathy voice quality and a nuclear L*+H accent
- *ISQ interpretation:* most often for *wh*-questions in modal voice quality with a nuclear H+!H* accent

### Clicks (Experiment 1 + 2)




- interaction between *accent type, voice quality* and *particle*
  → presence of *denn* strengthens both question interpretations

### Fixations (Experiment 1 + 2)




***Fixations starting at the onset of the sentence-final object.***

- fixations of both experiments start to increase towards the end of the *wh*-question
- participants rely on pitch accent type earlier in Experiment 1 but rely on voice quality earlier in Experiment 2

## *Discussion*:

- RQs and ISQs are both reliably identified based solely on their prosody, i.e. in absence of a disambiguating context
- prosodic configuration *nuclear L*+H accent* plus *breathy voice quality* could be a conventionalized prosodic contour to signal *wh*-RQs, following recent findings on conventionalized contours by Hellbernd & Sammler (2016) (see also Michalsky & Lommel, 2017)
- when *denn* is absent, participants still identify the same prosodic combinations as RQ and ISQ
- presence of *denn* seems to facilitate decisions for the identified prosodic configurations for ISQ and RQ
  → **ISQ:** H+!H* accent in modal voice quality, **RQ:** L*+H accent in breathy voice quality
- the increased mental effort during the processing of *wh*-questions and the fact that participants rely on voice quality earlier in Exp. 2 indicate that they might expect another prosodic pattern in the absence of *denn*

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