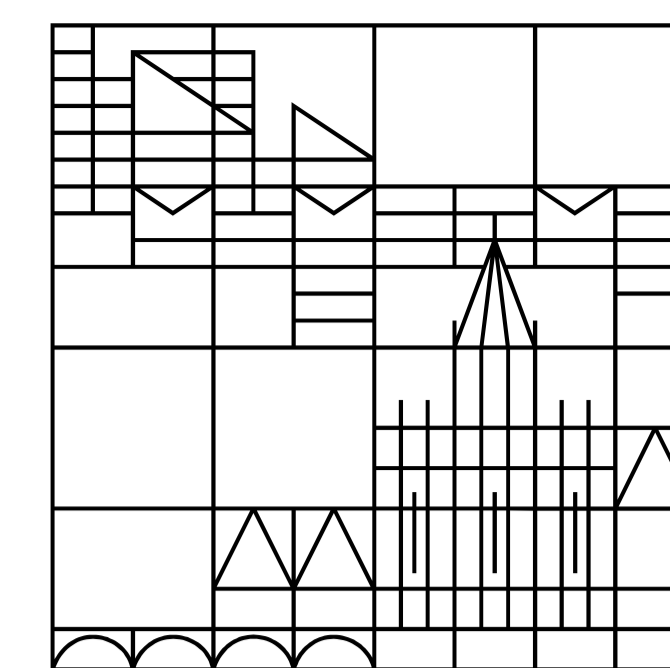


Interpreting Rhetorical Questions: The Influence of Pitch Accent Type, Voice Quality and the Modal Particle *denn*



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Background & Motivation:

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

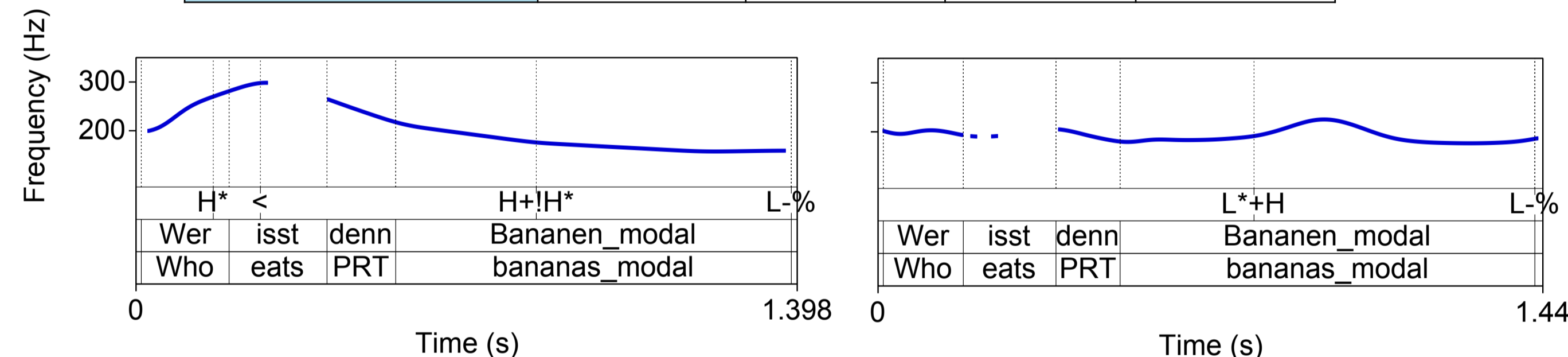
- **Experiment 1:** Are *voice quality* and *nuclear pitch accent type* relevant perceptual prosodic cues for the interpretation of German *wh*-questions as rhetorical or information-seeking when they are presented out of linguistic context?
- **Experiment 2:** Does the modal particle *denn* influence 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 | early-peak (H+!H*) | | late-peak (L*+H) | |
|---------------|--------------------|---------|------------------|---------|
| voice quality | modal | breathy | modal | breathy |



Experiment 2:

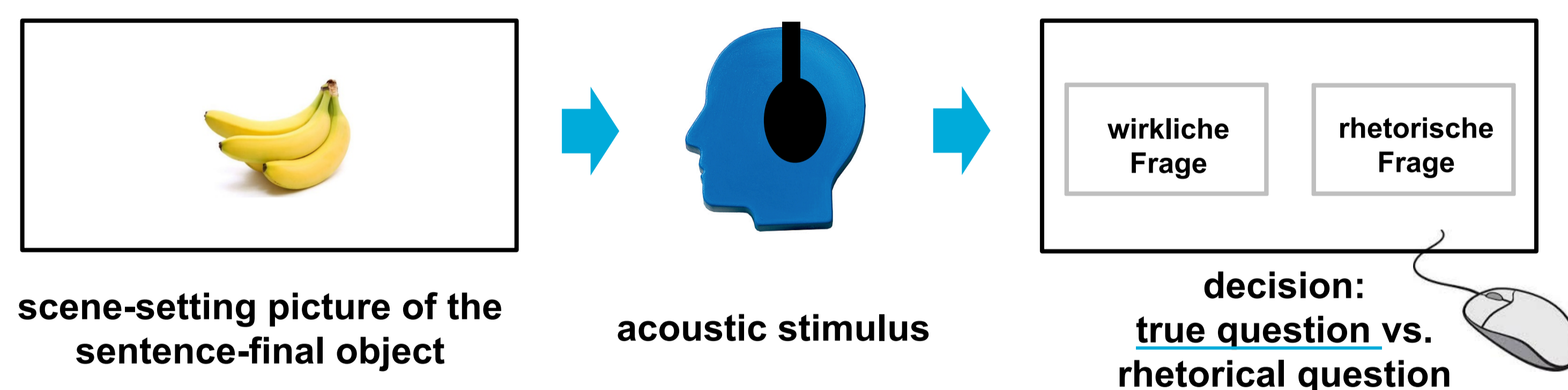
- identical to Experiment 1 **but** particle *denn* was cut out of the recordings

Participants:

48 monolingual native German speakers, 24 per experiment (Exp.1: $\bar{\varnothing} = 23.7$ years, 19 female; Exp. 2: $\bar{\varnothing} = 22.8$ years, 17 female)

Procedure:

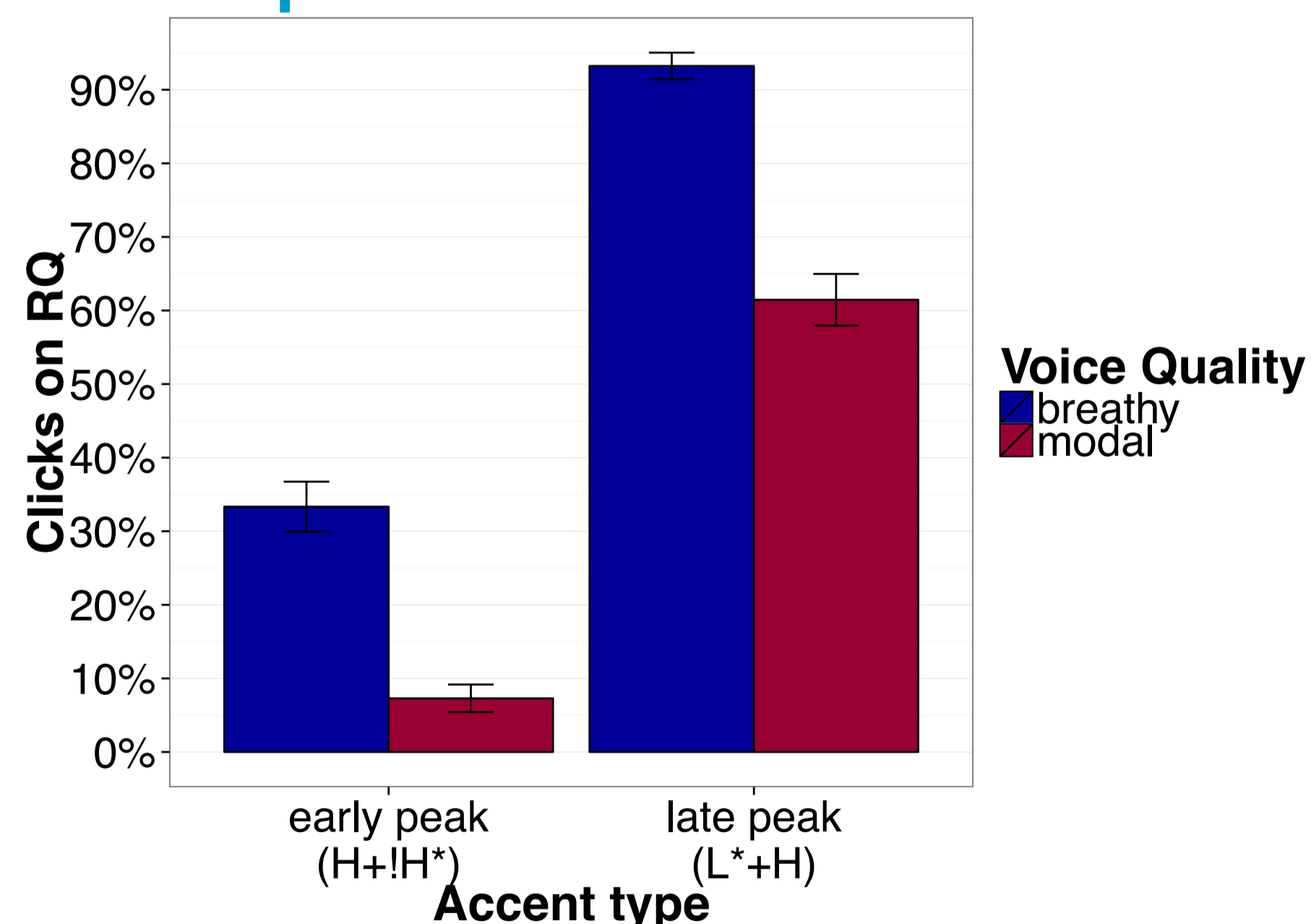
- listeners decided whether a *wh*-question played after a picture providing non-linguistic context was an ISQ or RQ
- *nuclear accent type* and *voice quality* (breathy vs. modal) were presented within-subjects, presence or absence of *particle* between-subjects



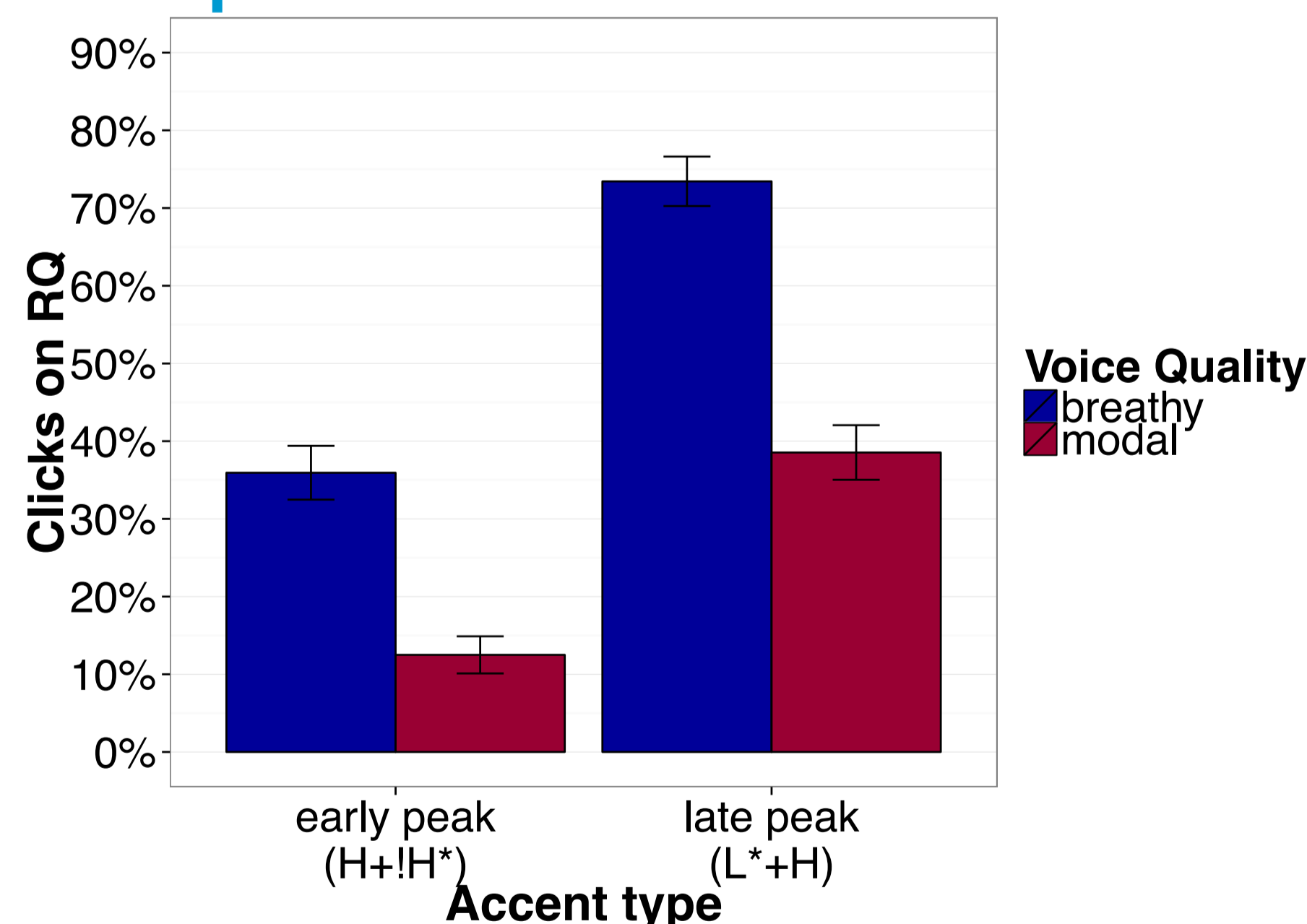
Results:

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

Experiment 1: with *denn*



Experiment 2: without *denn*



- interaction between *accent type*, *voice quality* and *particle*
- presence of *particle* strengthens the respective question interpretation (RQs & ISQs)

Discussion:

- RQs and ISQs are both reliably identified based solely on their prosody, i.e. in absence of a disambiguating context
- prosodic configuration *nuclear late-peak 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
- 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:** early-peak accent in modal voice quality (H+!H*), **RQ:** late-peak accent (L*+H) in *breathy voice quality*

Groenendijk, J. & M. Stokhof. 1984. *Studies on the semantics of questions and the pragmatics of answers*. Amsterdam: Universiteit van Amsterdam, PhD Thesis; Caponigro, I. & J. Sprouse. 2007. Rhetorical question as questions. *Proceedings of Sinn und Bedeutung*, vol. 11, pp.121-133; Meibauer, J. 1986. *Rhetorische Fragen*. Tübingen, Niemeyer.; Thurmair, M. 1991. Zum Gebrauch der Modalpartikel ‘denn’ in Fragesätzen: Eine korpusbasierte Untersuchung. In E. Klein, F. Pouradier Duteil & K. H. Wagner (eds.), *Betriebslinguistik und Linguistikbetrieb*. Linguistische Arbeiten 260, pp. 377-388, Tübingen: Niemeyer; Hellbernd, N. & D. Sammler. 2016. Prosody conveys speaker’s intentions: Acoustic cues for speech act perception. *Journal of Memory and Language*, vol. 88, pp. 70-86.



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