

The form and meaning of Hungarian declarative questions

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Introduction

- Genuine or information-seeking polar questions (ISQs) in Hungarian have a rise-fall contour (Kálmán, 2001; Varga, 2002; Gyuris, 2019)
- “yes-no interrogative + questioning” (Varga, 2002)

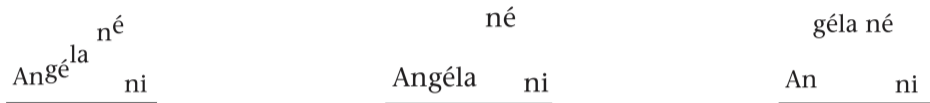


Figure 1: The “end-falling character contours” of genuine polar questions according to Varga (2002)

- The peak is obligatorily on the penultimate syllable (**né**) $L^*H-L\%$ (Grice et al., 2000)
- In contrast, assertions are $H^*L-L\%$ (Varga, 2002)

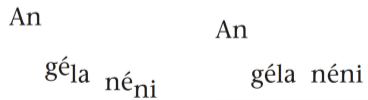
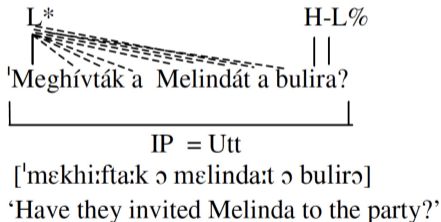


Figure 2: Front-falling character contours characterizing assertions according to (Varga, 2002)

Introduction

- Questions can also have multiple rise-fall contours over the utterance.
- Varga (2010) argues that multiple rise-fall contours are multiple instantiations of the same contour that we observe in a single-rise question.
- They will be referred to as *character contours* (accentual phrases?, intonational phrases?)

(3)a. Normal yes-no question:



(3)b. Incredulous yes-no question:

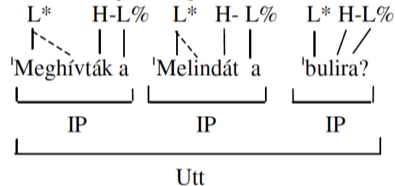


Figure 3: Single and multiple rise-fall questions in Hungarian Varga (2010)

Introduction

- The character contour that is repeated over the utterance can have different shapes.

| ˩Angéla néni? |

Angéla né
ni

Figure 4: The character contour of a question “expressing disbelief or surprise” (Varga, 2002)

| ˩Angéla néni? |

Angéla né
ni

Figure 5: Questions expressing surprise (“yes-no interrogative + exclaiming”) (Varga, 2002)

Introduction: Declarative questions

- Questions with multiple rise-fall contours are *declarative questions* (Poschmann, 2008)
 - ▶ declarative clause
 - ▶ question-like intonation
- Also known as
 - ▶ *(inquisitive) rising declaratives* in English (Gunlogson, 2003; Jeong, 2018)
 - ▶ *polar questions with multiple rise-fall contours* (Kálmán, 2001) or *rise-fall declaratives* (Gyuris, 2019) in Hungarian
 - ▶ *intonation questions* in Chinese languages (Gu et al., 2006; Ma et al., 2011) and in German (Petronne and Niebuhr, 2014)
- Declarative questions are not pragmatically equivalent to genuine questions (Kálmán, 2001; Varga, 2002; Gunlogson, 2003; Malamud and Stephenson, 2015; Gyuris, 2019, a.o.)
 - (1) a. Are you pregnant?
b. You're pregnant? (Gunlogson, 2003)

Research questions

How do declarative questions differ from genuine ones?

(How) can pragmatic meaning traits be related to traits of intonation?

In this talk:

- **confirmative vs. echo declarative questions (expressing surprise)**
- Characterize their special discourse effects
- Pilot experiment: intonation
- A tentative form-meaning mapping

Flavors of declarative questions

Confirmative declarative questions are used when the speaker is on their way to commit to p , but needs the addressee's confirmation, for a full-fledged commitment.

(2) **Confirmative** declarative question Type I (**CDQ I**)

Context: Mark is in a windowless room. His colleague enters the room with a wet umbrella.

Mark says to his colleague:

“It’s raining?[↑] (If it is, then I should get an umbrella.)”

(3) **Confirmative** Declarative Question Type II (**CDQ II**)

Context: Mark is in a windowless room. He sees that the weather forecast says it’s raining outside. His colleague comes in. Mark says to his colleague:

“It’s raining?[↑] (If it is, then I should get an umbrella.)”

(cf. Beun’s (2000) Schiphol phone conversation cited by Gunlogson (2003) and Gyuris (2019))

The speaker expresses tentative commitment, but the source of this commitment is different in both cases.

Flavors of declarative questions

(4) **Incredulous** Declarative Question (**IDQ**)

Context: Mark (in a windowless room) sees that the weather forecast says it's sunny outside. His colleague comes in and says that it's raining outside. Mark says to his colleague:

“It's raining?[↑] (I don't think so.)”

(5) **Echo** Declarative Question (**EDQ**)

Context: Mark (in a windowless room) sees that the weather forecast says it's sunny outside. Just about two minutes later, his colleague comes in with a wet umbrella and says that it's raining outside. Mark says:

“It's raining?[↑] (What a surprise.)”

Contextual factors

- Buring and Gunlogson (2000): *contextual evidence*
 - ▶ To utter *It's raining?*, there must be some trigger
 - ▶ “Evidence that has just become mutually available to the participants in the current discourse situation” (p. 7)
- Gunlogson (2003): Contextual Bias Condition
- Sudo (2013): *epistemic bias* vs. *evidential bias*
 - ▶ epistemic bias: a private belief held by the speaker prior to contextual bias
 - ▶ evidential bias = contextual evidence

The contextual evidence is conclusive: The speaker has no other choice than to follow the contextual bias.

Contextual factors: Epistemic bias

No epistemic bias: $P(\alpha) = P(\bar{\alpha})$



Contextual factors: Evidential bias

Wet guy: $P(\alpha) > P(\bar{\alpha})$



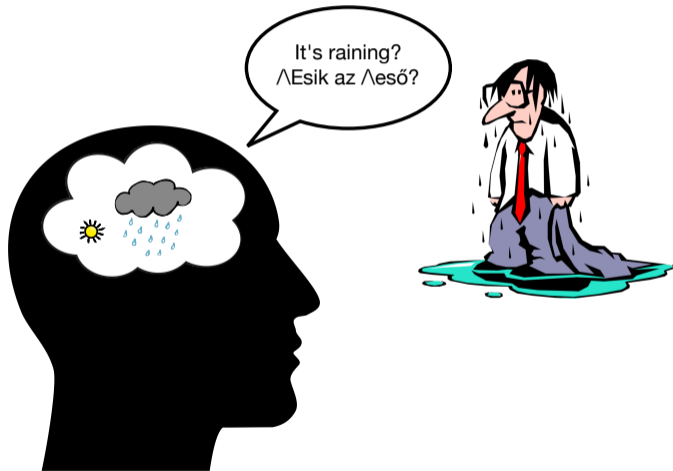
Contextual factors: Evidential bias

Evidential bias: $P(\alpha) > P(\bar{\alpha})$



Contextual factors: Evidential bias

As a result: a declarative question with α is licensed.



Contextual factors: Proposal

- Sudo's (2013) account works for all cases when the speaker is convinced by the contextual evidence
 - ▶ information-seeking (positive) polar questions ✓
 - ▶ confirmative declarative questions ✓
 - ▶ echo declarative questions ✓
 - ▶ incredulous declarative questions?
 - ★ Epistemic bias: The speaker thinks rain is unlikely
 - ★ Evidential bias: The speaker is told that it is raining (non-compelling evidential bias)
 - ★ The speaker does not change their "original" bias.
- Proposal:
 - ▶ To characterize the context of DQs, the following contextual factors are needed:
 - i) belief prior to contextual evidence
 - ii) contextual evidence
 - iii) belief following contextual evidence

Contextual factors: Proposal

- Building on Farkas and Roelofsen (2017), declarative questions have
 - ▶ basic conventional discourse effects:
 - ★ declarative clause type → contribute a single alternative α
 - ★ utterance-final rise (in English) → utterance is inquisitive, contributing two alternatives $\{\alpha, \bar{\alpha}\}$
 - ▶ special discourse effects:
 - ★ the speaker's credence level in the truth of α is at most low
 - ★ $c = [\text{zero}, \text{low}]$
 - ★ credence levels are signaled by intonation
- This characterizes incredulous and confirmative declarative questions but not surprise echo declarative questions.
 - ▶ Sudo (2013): confirmative, **incredulous**, echo declarative questions
 - ▶ F&R (2017): confirmative, incredulous, **echo** declarative questions.
- Questions/predictions
 - ▶ What intervals do the credence level of other declarative questions encompass?
 - ▶ If credence levels are signaled systematically by intonation, this should be the case in Hungarian declarative questions as well.

Contextual factors: Proposal

- (6) For a speaker x who utters a DQ ϕ with the highlighted alternative α , after considering relevant contextual evidence e available at time t in dialogue d , the special effects of ϕ are determined by the following:
- i. x 's **input credence level** in α , $c_x^i(\alpha)$, is an interval s.t. $c_x^i(\alpha) \subseteq [0..1]$, reflecting x 's prior belief about α , that is, x 's propositional attitude towards α at t' s.t. $t' \prec t$, where t is the time when e becomes available to x in d .
 - ii. **Relevant contextual evidence**, e , becomes available to x in d at t ; e can be a proposition contributed by a discourse participant or a salient event perceivable by x . e may be compelling (if given e , x can no longer commit to $\bar{\alpha}$), or non-compelling otherwise; and e may be trivial (if e assigns the same relative probability of α being true as in prior belief) or non-trivial otherwise.
 - iii. x 's **output credence level** in α , c_x^o , is an interval s.t. $c_x^o(\alpha) \subseteq [0..1]$, reflecting x 's resulting belief about α , that is, x 's propositional attitude towards α at time t , the time when e becomes available to x in d .

Flavors of declarative questions

ϕ	ISQ	CDQ I	CDQ II	IDQ	EDQ	A
c_x^i	$P(\alpha) = P(\bar{\alpha})$	$P(\alpha) = P(\bar{\alpha})$	$1 > P(\alpha) > P(\bar{\alpha})$	$P(\alpha) < P(\bar{\alpha})$	$P(\alpha) \leq P(\bar{\alpha})$	$P(\alpha) = 1$
e	$P(\alpha) = P(\bar{\alpha})$	$1 > P(\alpha) > P(\bar{\alpha})$	$P(\alpha) = P(\bar{\alpha})$	$P(\alpha) > P(\bar{\alpha})$	$P(\alpha) = 1$	$P(\alpha) = P(\bar{\alpha})$
c_x^o	$P(\alpha) = P(\bar{\alpha})$	$1 > P(\alpha) > P(\bar{\alpha})$	$1 > P(\alpha) > P(\bar{\alpha})$	$P(\alpha) < P(\bar{\alpha})$	$P(\alpha) = 1$	$P(\alpha) = 1$

Table 1: Input credence level (c_x^i), contextual evidence (e) and output credence level (c_x^o) in questions and assertions, characterized by the relative probability of the highlighted alternative α being true.

- How do these utterances sound?

Pilot experiment: Stimuli

• Stimuli

- ▶ 5-syllable long words: *Olaszországba* ‘to Italy’, *kunmadarasi* ‘from Kunmadaras’, *Angéla néni* ‘aunt Angela’, etc.
- ▶ Female native speaker of Hungarian, age 37
- ▶ Genuine questions
- ▶ Home recordings using Praat, made on a laptop
- ▶ Pitch manipulation done in Praat

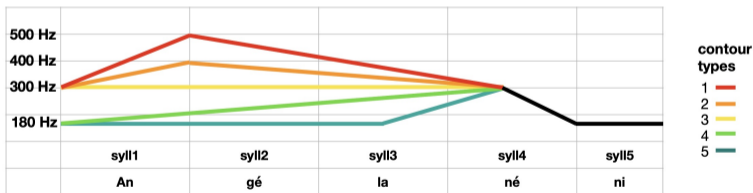


Figure 6: Conditions

Pilot experiment: Participants

- 45 participants per experiment
- PCibex farm (Zehr and Schwarz, 2018)
- Participant recruitment via Prolific:
 - ▶ Hungarian L1
 - ▶ born and raised in Hungary
 - ▶ Hungarian nationality
- Participants used laptops or desktop computers (clicking happened on a touchpad or by a mouse) > RT not informative

Pilot experiment: Stimuli & trials

- 7 items x 5 conditions = 35 target utterances, Latin Square
- Procedure
 - ▶ Participants hear a 1-word utterance
 - ▶ Participants choose between two options to describe what they heard
- Response: 2AFC
 - ▶ Exp 1: **question** (“kérdés”) or a **surprise** (“meglepődés”)
 - ▶ Exp 2: ‘[the speaker] awaits confirmation’ (“megerősítést vár”) or ‘[the speaker] is surprised’ (“meglepődött”)
- The experiment can be found here:
https://expt.pcibex.net/ibexexps/RFD/RFD_Q/experiment.html
- Net duration: 90 seconds
- 8 fillers
 - ▶ Experiment 1: 4 question fillers + 4 surprise fillers
 - ▶ Experiment 2: 4 confirmation-requesting fillers + 4 surprise fillers

Pilot experiment: Results

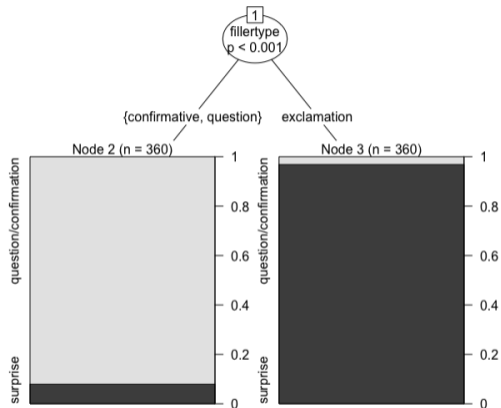


Figure 7: Outcome variable \sim filler type + task + participant (conditional inference tree in R, party)

Pilot experiment: Results

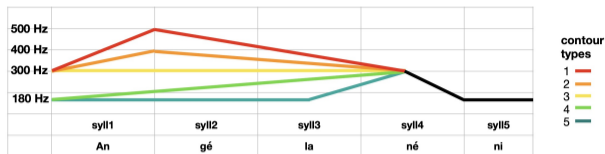


Figure 8: Conditions

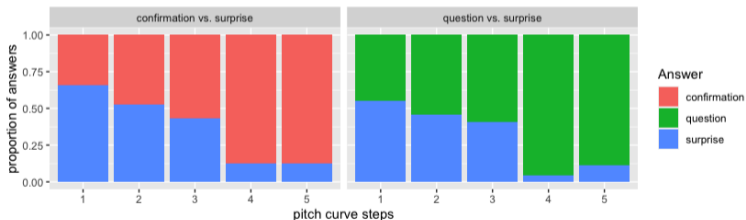


Figure 9: Proportion of answers to the five contours, in experiments 1 and 2 (315 observations per experiment)

Pilot experiment: Results

Results were analysed using logistic mixed effects models (R, lme4).

- Dependent Variable: Participants choice: question/confirmation vs. surprise
- Independent variable: contour type (1-5)
- Independent variable: word class (lexical vs proper name)
- Random variables: participants and items with intercepts
- Results:
 - ▶ confirmation vs surprise: Contour 1 more likely interpreted as surprise
 - ▶ confirmation vs surprise: Contours 2, 3: no significant effect
 - ▶ confirmation vs surprise: Contours 4, 5: more likely interpreted as confirmation
 - ▶ question vs surprise: Contour 1: no effect
 - ▶ question vs surprise: Contours 2-5 more likely interpreted as questions
 - ▶ proper names are more likely to be interpreted as surprise utterances

Discussion

- **L*H–L%:** Contours 4 and 5 are associated with questions/confirmation.
- **H*H–L%:**
 - ▶ The speech act type associated with contour 1 is ‘surprise’ if contrasted with ‘confirmation’, but not when contrasted with ‘question’
 - ▶ Possible explanations:
 - ★ In a sense, every target utterance is a question, the label may be misleading.
 - ★ The manipulated utterances were genuine questions.
- Lexical words got more ‘questions’ or ‘confirmation’ responses because utterances that express dependence on the interlocutor’s commitment are maybe more likely to contain verbs in the 2nd person.
- Proper names may be more neutral in this respect.

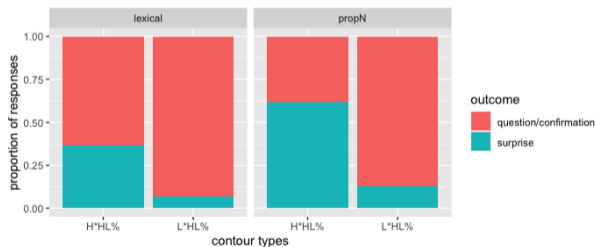


Figure 10: The proportion of ‘surprise’ answers to lexical words vs. proper names

Discussion

We propose that the character contours in CDQs have a $L^*H-L\%$ contour (similarly to the contour of ISQs which extends over the entire IP), exemplified by contours 4 and 5, and the character contour in EDQs have a $H^*H-L\%$ contour, exemplified by contour 1.

Special effects:

- i) the role of the high intermediate phrase ($H-$) is to signal that the probability of α in c_x^i is lower than 1, which is why only questions (ISQ; CDQs, IDQ, EDQ) have it but not assertions (A);
- ii) the low pitch accent (L^*) marks that the probability of α being true in c_x^o is lower than 1.

ϕ	ISQ: $L^*H-L\%$	CDQ I: $L^*H-L\%$	CDQ II: $L^*H-L\%$	IDQ: $L^*H-L\%$	EDQ: $H^*H-L\%$	A: $H^*L-L\%$
c_x^i	$P(\alpha) = P(\bar{\alpha})$	$P(\alpha) = P(\bar{\alpha})$	$1 > P(\alpha) > P(\bar{\alpha})$	$P(\alpha) < P(\bar{\alpha})$	$P(\alpha) \leq P(\bar{\alpha})$	$P(\alpha) = 1$
e	$P(\alpha) = P(\bar{\alpha})$	$1 > P(\alpha) > P(\bar{\alpha})$	$P(\alpha) = P(\bar{\alpha})$	$P(\alpha) > P(\bar{\alpha})$	$P(\alpha) = 1$	$P(\alpha) = P(\bar{\alpha})$
c_x^o	$P(\alpha) = P(\bar{\alpha})$	$1 > P(\alpha) > P(\bar{\alpha})$	$1 > P(\alpha) > P(\bar{\alpha})$	$P(\alpha) < P(\bar{\alpha})$	$P(\alpha) = 1$	$P(\alpha) = 1$

Remaining issues: A note on information-seeking questions

- Sudo (2013) claims that positive polar questions (PPQs) are compatible with positive evidential bias: We claim that information-seeking questions (ISQs) are not.
- In English, PPQs in a biasing context certainly are marked by intonation.
- Hungarian does not allow single-rise questions in biasing contexts, they obligatorily become multiple-rise questions.
- Example context from Kiss & Szalontai (2019): Maja is a tenant of you and your partner's apartment, and you just discovered, based on your bank account, that Maja only payed for June and August, but not for July. Suspecting that your lenient partner has let Maja not pay for July, you say: “Elengedett Majának a júliust?”

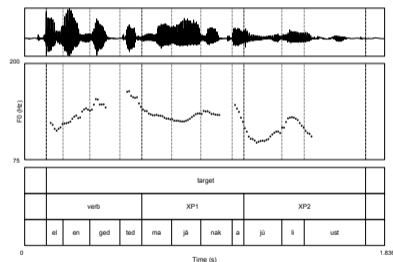


Figure 11: A trial with biasing context from Kiss & Szalontai's pilot

Remaining issues: A note on information-seeking questions

- (15) [A&B are looking at a co-worker's much-dented car]
A: His driving has gotten a lot better.
B's response:
a. Has it? I don't see much evidence of that.
b. It has? I don't see much evidence of that.
(Gunlogson, 2003, p. 21, (44a–b))

The next example shows that a /\
-declarative is also felicitous in the same context:

- (16) [A&B are looking at a co-worker's much-dented car]
A: His driving has gotten a lot better.
B's response:
B: Már ^sokkal ^jobb^ ^vezet? Nem sok jelét látom.
already much better drive.3sg not much sign.its.acc see.1sg
'His driving has gotten a lot better? I don't see much evidence of that.'

Figure 12: Example of a biasing context from Gyuris (2019)

True information-seeking polar questions are not used in biasing contexts. If a PPQ in English is used in a biasing context, it arguably comes with a marked intonation.

Remaining issues: What counts as an echo question?

- Poschmann (2008) uses a wide notion of echoing, anything that targets the form and the information content of the immediately preceding utterance.
 - ▶ Information content (van der Sandt 1992): Propositional content, presuppositions, implicatures
 - ▶ Echoing is possible even in the absence of a prior utterance.
 - ▶ If that's the case, even confirmative declarative questions can be considered echoic.
- Poschmann's distinction:
 - ▶ Confirmative declarative questions: The speaker's commitment depends on the addressee's acknowledgment
 - ▶ Echo declarative questions: The speaker is already committed.
 - ★ Echo declarative questions in this talk: Surprise questions by which the speaker commits to α .

Conclusion

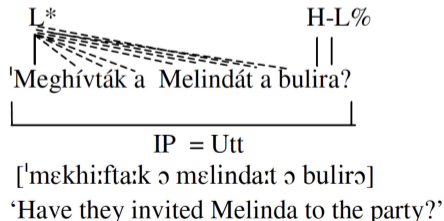
Semantics/pragmatics of declarative questions

- The pragmatic characterization of declarative questions should include two “stages” of bias, one prior to contextual evidence and one following it.

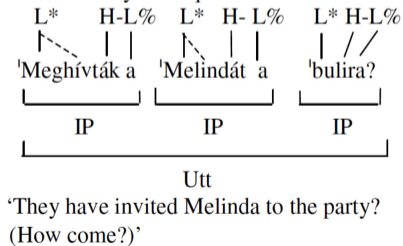
Prosody of Hungarian declarative questions

- We looked at what Varga calls the character contour of single and multiple rise-fall interrogatives in Hungarian, associating both with 5-syllable utterances in a perception study.

(3)a. Normal yes-no question:



(3)b. Incredulous yes-no question:



Conclusions

● Findings

- ▶ When presented as a single contour, information-seeking and confirmative declarative questions were not distinguished by participants. → supports Varga's claim
- ▶ Information-seeking and confirmative questions do differ from (surprise) echo declarative questions: contour 1 vs. contours 4 & 5

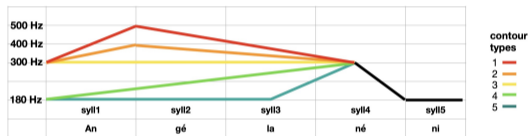


Figure 13: Conditions

● To-do-list:

- ▶ Conduct perception experiment with utterances involving multiple character contours such as “Meghívták a Melindát a bulira?”
- ▶ Include both genuine questions and echo declarative questions as bases of manipulation.
- ▶ Include incredulous declarative questions
- ▶ Intuition: Scaling will serve as a further predictor in signalling pragmatic meaning (downdrift: incredulity/disapproval?)

Acknowledgments

- To the organizers: Thank you for letting us present online!
- The audience of the 2019 Montréal-Ottawa-Toronto workshop on phonology and phonetics, Jessamyn Schertz
- The audience and reviewers of ICSH14, Balázs Surányi
- The audience of the 2021 Toronto–Ottawa–Montréal workshop on semantics and pragmatics

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Appendix

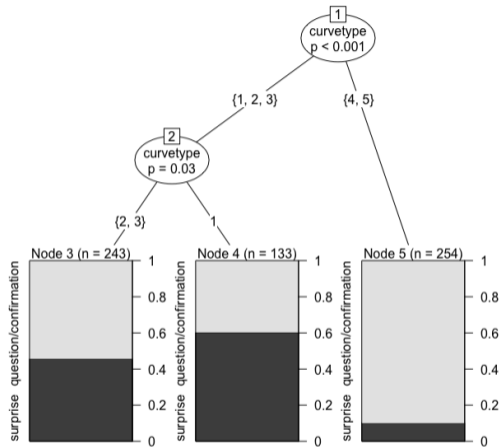


Figure 14: $\text{OUTCOME} \sim \text{CURVETYPE} + \text{TASK}$

Appendix

Conditional inference tree models reveal the particular effects WORD CLASS and PARTICIPANT have on the outcome variable.

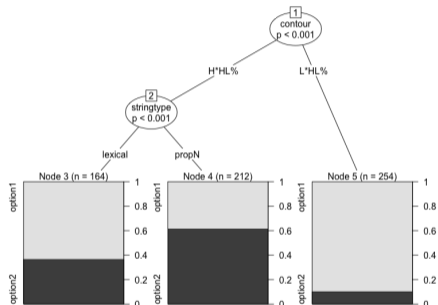


Figure 15: $\text{OUTCOME} \sim \text{CURVETYPE} + \text{TASK} + \text{WORD CLASS}$

option1 = question/confirmation; **option2** = surprise

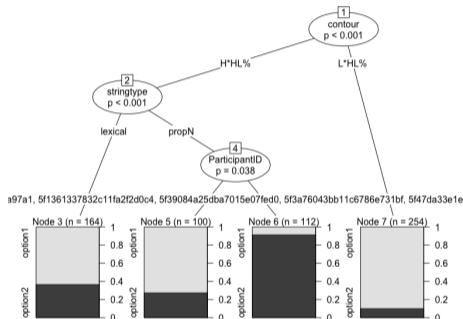


Figure 16: $\text{OUTCOME} \sim \text{CURVETYPE} + \text{TASK} + \text{WORD CLASS} + \text{PARTICIPANT}$