**The form and meaning of Hungarian confirmative and echo declarative questions**

Declarative questions (DQs) are a biased question type that express a non-neutral epistemic stance towards the anchor proposition. We investigate the form and meaning of two major types of DQs in Hungarian (aka *rise-fall declaratives*, see Gyuris 2019): confirmative and echo declarative questions. A confirmative declarative question (CDQ) is similar to an information-seeking polar question (ISQ) in that the speaker is not committed to the truth of the anchor proposition, but unlike ISQs, CDQs convey speaker bias towards it. An echo declarative question (EDQ) differs both from ISQs and CDQs in that it commits the speaker to the anchor proposition, signalling surprise at the same time.

(1) Context: Mark is in a windowless room. His colleague enters the room with a wet umbrella. Mark says to his colleague: Esik/\ az eső/\? 'It's raining?' (**CDQ**)

(2) Context: Mark (in a windowless room) sees that the weather forecast says it's sunny outside. His colleague comes in with a wet umbrella and says that it's raining outside. Mark says: Esik/\ az eső/\? 'It's raining?' (**EDQ**)

We build on the commitment-based, inquisitive semantic account of Farkas & Roelofsen (2017), where basic discourse effects of a DQ $\phi$ consist in placing $[\![\phi]\!] = \{\alpha, \overline{\alpha}\}$ on the Table and update the speaker's commitments by the set of all possible worlds ($W$). DQs, having a marked form, also have special discourse effects (marked by intonational contours), which consist in the assignment of a *credence level* to the highlighted alternative ($\alpha$), determined by the degree to which the speaker believes $\alpha$ to be true. Building on Büring & Gunlogson (2000), Sudo (2013) and Northrup (2014), we propose that a commitment-based account of DQs needs to keep track of the following:

(3) For a speaker $x$ who utters a DQ $\phi$ with the highlighted alternative $\alpha$, after considering relevant contextual evidence $e$ available at time $t$ in dialogue $d$, the special effects of $\phi$ are determined by the following:

a. $x$'s **input credence level** in $\alpha$, $c_x^i(\alpha)$, is an interval s.t. $c_x^i(\alpha) \subseteq [-1...1]$, reflecting $x$'s prior belief about $\alpha$, that is, $x$'s propositional attitude towards $\alpha$ at $t$' s.t. $t' \prec t$, where $t$ is the time when $e$ becomes available to $x$ in $d$.

b. **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 $\overline{\alpha}$), or non-compelling otherwise; and $e$ may be trivial (if $e$ assigns the same relative probability of $\alpha$ being true as in prior belief) or non-trivial otherwise.

c. $x$'s **output credence level** in $\alpha$, $c_x^o$, is an interval s.t. $c_x^o(\alpha) \subseteq [-1...1]$, reflecting $x$'s resulting belief about $\alpha$, that is, $x$'s propositional attitude towards $\alpha$ at time $t$, the time when $e$ becomes available to $x$ in $d$.

Credence levels reflect speaker bias, and speaker bias is determined by the relative probabilities of $\alpha$ and $\overline{\alpha}$ being true (following Kraus 2019). **ISQs** are felicitously used when the speaker's prior and resulting belief about $\alpha$ is that the probability of $\alpha$ and $\overline{\alpha}$ being true is equal (P($\alpha$) = P($\overline{\alpha}$)). **CDQs** have the same prior belief as ISQs, but differ from ISQs as $e$ is non-trivial and hence gives rise to a bias. $x$'s resulting belief about $\alpha$ is that the probability of $\alpha$ being true is greater than the probability of $\alpha$ being false (P($\alpha$) > P($\overline{\alpha}$)). **EDQs** potentially express a prior bias towards $\overline{\alpha}$ (P($\alpha$) $\leq$ P($\overline{\alpha}$)), but due to $e$ being compelling evidence for $\alpha$ in this case, the speaker commits to $\alpha$. Credence levels of $\alpha$ are determined by the relative probability of $\alpha$ being true, see Table 1.

| $\phi$ | ISQ | CDQ | EDQ |
|---|---|---|---|
| prior belief | P($\alpha$) = P($\overline{\alpha}$); $c_x^i$ = [0, 0] | P($\alpha$) = P($\overline{\alpha}$); $c_x^i$ = [0, 0] | P($\alpha$) $\leq$ P($\overline{\alpha}$) $c_x^i$ = [$-0.7$, $-0.2$ ] |
| $e$ | P($\alpha$) = P($\overline{\alpha}$) | 1 > P($\alpha$) > P($\overline{\alpha}$) | P($\alpha$) = 1 |
| resulting belief | P($\alpha$) = P($\overline{\alpha}$); $c_x^o$ = [0, 0] | 1 > P($\alpha$) > P($\overline{\alpha}$); $c_x^o$ = [0.2; 0.6] | P($\alpha$) = 1; $c_x^o$ = [1, 1] |

Table 1: Prior belief, contextual evidence and resulting belief in the case of ISQs, CDQs and EDQs. characterized by the relative probability of $\alpha$ being true and by example values for credence levels.

If special effects are signaled by markedness in form, as proposed by Farkas & Roelofsen (2017), we expect that at least some of the above mentioned distinctions outlined here have prosodic correlates in CDQs and EDQs. Previous research has shown that in production, speakers primarily use pitch peak alignment as a phonetic cue to distinguish the two: EDQs had an earlier peak on the first accentual phrase (AP) of the sentence (Szalontai & Kiss 2019). We conducted two online perception experiments: in the first one, participants decided whether the 5-syllable utterance they heard conveyed a *request for confirmation* or a *surprise*; and in the second one, the two options were *question* vs. *surprise*. Each item was manipulated as shown in Figure 1: the pitch curves were created so that they form a scale ranging from high and early peak with a high onset (contour 1) to to low and late peak with a low onset (contour 5). Note that contour 5 is identical to the intonational contour of ISQs, as CDQs and ISQs both carry the same intonational contour, except CDQs mark it on every AP, while ISQs have a single rise-fall contour over the entire intonational phrase (cf. Varga 2010, Gyuris 2019).

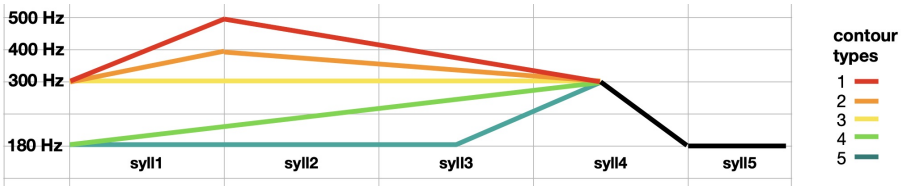


Figure 1: Stimuli

The response rates indicate a line of division between contour 3, a flat contour, and contour 4, a late peak contour with a low onset, see Figure 2.

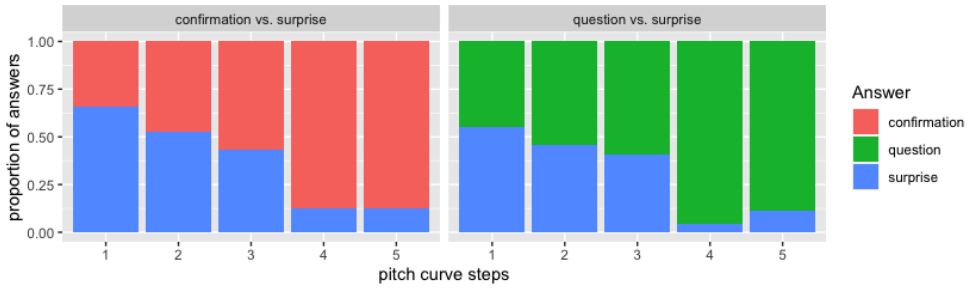


Figure 2: Response rates in the two perception experiments

We propose that APs 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 APs in EDQs have a H* H−L% contour, exemplified by contours 1−3. As for the special effects, we claim that 1) the low pitch accent (L*) present in ISQs and CDQs marks lack of commitment to $\alpha$ in $c_x^o$; and 2) the role of the high intermediate phrase (H−) is to signal a lack of prior commitment (i.e., $c_x^o$ excludes 1), which explains why only questions (ISQs or DQs) have it but not assertions (H* L−L%).

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