

Structured Questions

This work addresses a previously undescribed phenomenon of what I call *structured questions*. I claim that these questions encode a hierarchical QUD structure: in a single utterance, they raise both a main QUD (Question Under Discussion), and a sub-QUD.

The object of study. Below is a Turkish example of a structured alternative question (AQ) (Turkish has other types of structured questions, not discussed here for reasons of space).

- (1) Kahve mi ist-iyor-sun, yoksa çay mı, süt mü...?
coffee Q want-ipf-2sg not-if tea Q milk Q
≈ Do you want coffee, or tea, or milk? (typically non-exhaustive list)

The intuitive meaning of this question is the following. The speaker wants to know what the addressee wants, among several options: a main one – coffee, that is of higher importance (e.g. for its relevance or utility), as well as a number of less prominent options, that include tea and milk. The addressee responds to this question by picking an option. The question in (1) contrasts with a typical *"flat"* AQ, in which each alternative has equal prominence:

- (2) Kahve mi ist-iyor-sun, çay mı, (yoksa) süt mü?
coffee Q want-ipf-2sg tea Q (not-if) milk Q
≈ Do you want coffee, tea, or milk? (obligatorily exhaustive list)

In addition to differences in prominence distribution between the alternatives, structured and flat AQs differ in the availability of a *non-exhaustivity* inference. A list of alternatives is exhaustive when all the possible options have been uttered; it is non-exhaustive when there may be other options left unmentioned. Exhaustive and non-exhaustive inferences are available in English AQs, each associated with a particular prosodic contour (see Zimmerman 2000, Pruitt 2008, Biezma & Rawlins 2012, a.o.). In Turkish, all AQs, flat or structured, can have an exhaustive reading, but only structured AQs may have a non-exhaustive reading (non-/exhaustivity inferences in Turkish are also each associated with a particular prosodic contour).

The crucial difference in form between structured and flat AQs is the position of the particle *yoksa* (composed of "not" (*yok*) and "if" (*-sa*)), that appears between alternatives. In flat AQs, *yoksa* appears right before the last alternative; if it is the only *yoksa* particle in the question, its presence is optional and does not affect the meaning of the question in any perceptible way. Examples of flat AQs are of the form *ab, aYb, abYc, aYbYc* (where *a,b,c* are alternatives of the form "*p mı*" for a proposition *p*, and *Y* is *yoksa*). In structured questions, *yoksa* appears between non-final alternatives. Examples are *aYbc, aYbcd, abYcd, aYbYcd, aYbYc*. Note that requirements for flat and structured are not incompatible: *aYbYc* can be either flat or structured.

Gist of the proposal. I propose to capture the meaning of structured questions by appealing to the notions of QUDs and sub-QUDs (see Roberts 1996, 2012, Büring 2003, a.o.). A sub-QUD is defined as a QUD that, once settled, at least partially responds to the main QUD. Questions that raise sub-QUDs are strategies that help achieve the goal of answering the main QUD: by bringing attention to a specific alternative of the main QUD, there is more chance for the hearer to be able to answer it. Utterances that raise QUDs and sub-QUDs are said to *structure* the discourse.

In Turkish, I propose that this structure can be encoded in single utterances, namely in structured questions. More specifically, such questions as (1) are discourse strategies that raise exactly two QUDs: a main QUD (What do you want?) and a sub-QUD (Do you want coffee?). In addition, facts about non-/exhaustivity can be explained as follows: there is a general requirement for exhaustivity in Turkish questions; a question is exhaustive in relation to a QUD; a flat AQ will therefore be

exhaustive relative to the unique QUD it raises; a structured AQ, on the other hand, will be exhaustive relative to its sub-QUD, leaving the main QUD alone – and thus allowing the list of alternatives mentioned in the question to remain non-exhaustified.

Ingredients of the analysis. I assume Inquisitive Semantics (Ciardelli, Groenendijk & Roelofsen 2015, a.o.), to be able to treat inquisitive and non-inquisitive objects on a par. Below, I lay out the semantics of the Turkish question operator, the question particle m_i , and the particle *yoksa*.

The question operator Q-op is a null operator that is present in all utterances that are specified as questions in the syntax. $\llbracket \text{Q-op}(p) \rrbracket$ presupposes that the inquisitive disjunction of linguistically available alternatives corresponds to QUD_0 , the most recent QUD: $p \vee \bigvee \Pi_p = \llbracket \text{QUD}_0 \rrbracket$, where Π_p is the set of propositions required by the presuppositions of p to be possible answers of QUD_0 . The question particle m_i forces inquisitive disjunction between propositions it selects. Based on the semantics for KA from Szabolcsi 2015, $\llbracket m_i \rrbracket$ requires, for X and Y of type t , that $\llbracket X m_i, Y \rrbracket = \llbracket X, Y m_i \rrbracket = A \vee B$; and the asserted content of $\llbracket X m_i \rrbracket$ is $\llbracket X \rrbracket$.

The particle *yoksa* marks the last uttered item of a QUD (like Hungarian *pedig*, see Szabolcsi 2016). The term "item of a QUD" is a semantic requirement, formalized as follows. $\llbracket p_i \text{ yoksa } q_i \rrbracket = p \vee q$, presupposes that the most linguistically salient non-inquisitive proposition containing $\neg p \wedge q$ is an answer to QUD_0 . Specifically: if q is non-inquisitive, it is an item of QUD_0 ; if it is inquisitive, then $\neg p$ (ensured by \neg to be non-inquisitive) will be required to be an item of QUD_0 .

The term "last uttered" is a phonological requirement. I claim that the phonological item *yoksa* breaks up prosodic constituency (OT analysis available), affecting syntactic constituency (Selkirk 2011) in the following way:

	$\llbracket [ab]c \rrbracket$	$\llbracket a[bc] \rrbracket$
OT	abYc	✓
	aYbc	✓
	aYbYc	✓

Derivations.

No *yoksa* (flat AQ): $\llbracket A m_i B m_i \rrbracket = A \vee B$. $\llbracket \text{Q-Op} \rrbracket$ requires that $A \vee B = \llbracket \text{QUD}_0 \rrbracket$. The only possible answers to QUD_0 are A and B , therefore the question is exhaustive. (We find a similar result for AQs with n alternatives without *yoksa*, for any n).

With *yoksa* in final position (flat AQ): $\llbracket \llbracket [A m_i B m_i] \text{ yoksa } C m_i \rrbracket \rrbracket = A \vee B \vee C$. $\llbracket \text{yoksa} \rrbracket$ requires that the most salient non-inquisitive proposition containing $\neg(A \vee B) \wedge C$ is an item of QUD_0 . Such a proposition is C . Then $\llbracket \text{Q-Op} \rrbracket$ requires that $A \vee B \vee C \vee C = A \vee B \vee C = \llbracket \text{QUD}_0 \rrbracket$. This means the question is exhaustive. (Similar result for any question of the form $a_1 \dots a_{n-1} Y a_n$, for $n > 1$). Importantly, we find $\llbracket a_1 \dots a_{n-1} Y a_n \rrbracket = \llbracket a_1 \dots a_{n-1} a_n \rrbracket$, which matches the data.

With *yoksa* in non-final position (structured AQ): $\llbracket \llbracket [A m_i \text{ yoksa } [B m_i C m_i]] \rrbracket \rrbracket = A \vee B \vee C$. $\llbracket \text{yoksa} \rrbracket$ requires that the most salient non-inquisitive proposition containing $\neg A \wedge B \vee C$ is an item of QUD_0 . $B \vee C$ is inquisitive, therefore it cannot be used as an alternative to a QUD; therefore, $\neg A$ is used instead. $\llbracket \text{Q-Op} \rrbracket$ requires that $A \vee B \vee C \vee \neg A = \llbracket \text{QUD}_0 \rrbracket$. In AQs, alternatives are mutually exclusive (see Groenendijk & Roelofsen 2009, Biezma & Rawlins 2012, a.o.), i.e. exhaustified with respect to each other. Exhaustified alternatives B and C don't overlap with A , and are therefore subsumed under $\neg A$. Therefore, $A \vee \neg A = \llbracket \text{QUD}_0 \rrbracket$. The denotation of the question $A \vee B \vee C$ must be relevant, i.e. directly address a QUD' (see Büring 2003): $A \vee B \vee C \subseteq \llbracket \text{QUD}' \rrbracket$. Here, we have $\llbracket \text{QUD}_0 \rrbracket \subset \llbracket \text{QUD}' \rrbracket$, where QUD_0 is a sub-QUD to QUD' : these are the two QUDs that structure the question. Moreover, there is no requirement for the denotation of the question to equal QUD' : this means that A, B, C can be an open list of alternatives, and the question may be non-exhaustive.

Sel.references. BR2012: Responding to alternative and polar questions. Bü2003: On D-Trees, Beans, and B-Accents. CGR2015: Inquisitive Semantics. GR2009: Inquisitive sem and pragmatics. Pr2008: Prosody and focus in alternative questions. Ro2012: Info Structure in Discourse. Se2011: The syntax-phonology interface. Sz2015: What do quantifier particles do? Zi2000: Free choice disjunction and epistemic possibility.