Exhaustiveness in embedded questions across languages (ExQ)

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Background

Groenendijk & Stokhof (1982: 180) distinguish between three levels of strength in the exhaustive interpretation of interrogatives, which manifest themselves in three different interpretations of embedded questions like (1).

(1) Peter knows who came to the party.

Under a strong exhaustive (SE) reading, (1) would be true in case Peter knows of all individuals within a relevant domain who came to the party that they came and of all individuals who did not come to the party that they did not come. Under an intermediate exhaustive (IE) reading, Peter would need to know of every individual who came to the party that s/he came, and, further, he must not falsely believe of any individuals that did not come to the party that they came. And under a weak exhaustive (WE) reading, for (1) to be true, Peter only has to know of everyone who came to the party that s/he came. In addition to these three exhaustive readings, there is also the possibility of a non-exhaustive (NE) interpretation, mostly discussed in connection with *mention-some* questions (Bäuerle & Zimmermann 1991). In an appropriate context, (1) would be true under a NE reading if Peter knows at least one person that came to the party.

It is a matter of debate whether the different readings are semantic in nature or whether they result from pragmatic inferences. Groenendijk & Stokhof (1984) argue that the SE reading is mandatory and thus part of the semantics of questions, as the authors assume that questions partition the logical space in the form of mutually exclusive exhaustive answers. In contrast, the alternative based account of Karttunen (1977), which defines questions as sets of true answers, suggests that the WE reading constitutes the truth-conditional meaning of questions. Stronger readings would need to be pragmatically derived. Heim (1994) observes that the interpretation of embedded wh-interrogatives also depends on the embedding predicate. She notes that wh-interrogatives embedded under matrix verbs other than *know* often do not come with SE readings. Klinedinst & Rothschild (2011) attest IE readings with factive verbs and with the non-factive communication verbs *tell* and predict. Further approaches to the exhaustiveness of embedded questions include Spector (2006), Guerzoni & Sharvit (2007), George (2011) and Uegaki (2015).

The existence of various theoretical analyses, which make different empirical predictions, seems tied to the fact that the empirical basis is far from clear. A major reason for the empirical uncertainty is the fact that the different interrogative readings are logically related by entailment from SE to IE to WE to NE. There is only one experimental study (Cremers and Chemla 2016) that tries to elucidate the empirical situation, but this study is limited to two embedding verbs in English. Experimentally controlled data on embedded questions in other languages and with more verbs of embedding are not available. Our project aims to fill this empirical gap.

Goals of the project

The project has three central research objectives: First, by carrying out a series of experiments in different typologically unrelated languages, we want to establish a solid empirical basis of the availability of the four potential interpretations of embedded wh-interrogatives with different embedding verbs, in different syntactic construction types across different languages, and across different pragmatic factors. Second, on the theoretical level, we aim to develop an empirically grounded analysis of the exhaustivity of embedded interrogatives (and matrix questions) at the semantics-pragmatics interface. Third, methodologically we aim to create easy to use, cross-linguistically and cross-culturally applicable experimental designs that do not create too much cognitive overload in participants for semantic fieldwork situations.

Methods

We will conduct different experiments on the following languages: German and English, Ulster English, Hausa (Chadic), Akan, Ga (both Kwa), Farsi (Iranian), Romanian (Romance), and Hungarian (Finno-Ugric). Two experimental paradigms will be employed: Paradigm I uses a sentence verification task aimed at shedding light on the question of which interpretations of embedded wh-interrogatives are independently available in a given context. Participants face the task of judging the correctness of a target interrogative against a linguistic context. Context description and target interrogative are manipulated according to different logical (e.g. target readings) and linguistic

factors (embedding predicates), whereas the judgment [+/- correct] is the dependent variable. The first sentence of each context specifies the question domain by introducing a specific group of individuals. The second sentence specifies that a subset of these individuals has some property whereas the rest does not. By using an appropriate matrix predicate, the third clause ascribes to some attitude holder a specific cognitive or emotive attitude (knowledge, belief, surprise) or a communication attitude (tell, predict) towards the scenario in question. Then follows the target embedded interrogative to be judged as correct or not, given the situation and attitude description, sometimes accompanied by an explanatory sub-clause. Situation and attitude descriptions constitute four basic conditions, SE, IE, WE and NE, labeled after the logically strongest reading that is available for the target interrogatives in each context. The four basic contexts constitute prototypical instantiations of the four readings under discussion. The target interrogatives are presented in an affirmative [-NEG] and a negated [+NEG] version. The inclusion of four [+NEG] conditions is necessary because of the logical entailment relations between the four potential readings. A [+correct] judgment for the four [-NEG] conditions is under-informative: It only shows that the interrogative is acceptable on the strongest context-compatible interpretation, or on any of the logically weaker readings entailed by it. By adding the [+NEG] conditions, we reverse the logical relations so that we end up with distinct empirical predictions for each potential reading. (2a) and (2b) exemplify a stimulus for English *predict* in the two conditions.

(2) a. **[WE, -NEG]** Last night, Bill, John and Audrey went to a karaoke bar. Bill and John sang, but Audrey didn't. *Before they went, Marc predicted that Bill, John and Audrey would sing, since they all seemed up for it.* **Marc predicted who sang.**

b. **[WE, +NEG]** Last night, Bill, John and Audrey went to a karaoke bar. Bill and John sang, but Audrey didn't. *Before they went, Marc predicted that Bill, John and Audrey would sing, since they all seemed up for it.* **Marc did not predict who sang because he predicted that Audrey would sing.**

A [+correct] judgment for (2a) is compatible with both a WE and a NE reading. In contrast, with regard to (2b) a [+correct] judgment is compatible with a SE and an IE reading.

The experiments in paradigm II will provide evidence on the possible status of some exhaustive readings as pragmatic implicatures. In this paradigm, we will elicit felicity judgments on embedded wh-interrogative stimuli that do or do not give rise to contradictions in context, depending on which interpretation(s) is/are available. The items are of a similar set-up as in paradigm I with the important difference that there is an additional sentence at the end of the target introduced by a connective (*and* or *but* for positive cases and *because* for negative cases). The introduction of the last stimulus sentence (in the positive conditions) gives us a further possibility for distinguishing between semantic and pragmatic inferences in the interpretation of embedded interrogatives. This is based on the assumption that pragmatic inferences can be cancelled or contradicted with the contrastive connective *but* without a high loss in felicity, but not with *and*. (3a) and (3b) exemplify test items that will be used in paradigm II.

(3) a. **[SE, -NEG]:** Yesterday, Maria, Gaby, Sue and Elisa went to a great party. Gaby, Sue and Elisa all danced, but Maria had a sprained ankle and didn't dance. **Murat knows who danced. And/But he doesn't know that Maria didn't.**

b. **[SE, +NEG]:** Yesterday, Maria, Gaby, Sue and Elisa went to a great party. Gaby, Sue and Elisa all danced, but Maria had a sprained ankle and didn't dance. **Murat does not know who danced, because he doesn't know that Maria didn't.**

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