

Two questions about embedded questions

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I Setting the stage

- Overarching question:
What regulates the distribution and the interpretation of embedded questions?

(1) Tunçi knows whether it was snowy.
attitude holder attitude verb embedded question

a. The distribution question:

Why can questions be embedded under certain verbs but not others?

know that/whether

wonder *that/whether

believe that/*whether

b. The interpretation question of interest today: Veridicality

A sentence like (1) entails that the attitude holder believes the true answer to the question “Was it snowy?” This isn’t always the case, e.g., in (2).

(2) Tunçi and Kardi {agree on, %misremember} whether it was snowy.

Why is the attitude holder’s belief sometimes about true answers, sometimes about potential, and sometimes about false answers?

true answers: know, remember, wonder, ask,¹

potential answers: decide, agree, be certain,

[the belief could be true, could be false]

false answers: misremember.

- This talk zooms in on embedded questions in Turkish, which it has (at least) three kinds of:

(3) a. Nominalized

Tunçi [kar yağ-ıp yağ-ma-dığ-ın-ı] {merak ediyor, biliyor}.

Tunçi snow fall-CONJ fall-NEG-NMZ-3S-ACC wonders knows

b. Tensed/finite, without *diye*

Tunçi [kar yağ-dı mı] {merak ediyor, biliyor}.

Tunçi snow fall-PST POLQ wonders knows

c. Tensed/finite, with *diye*

Tunçi [kar yağ-dı mı diye] {merak ediyor, *biliyor}.

Tunçi snow fall-PST POLQ DIYE wonders knows

Tunçi {wonders, knows} whether it snowed.

- I present two puzzles about the distribution and interpretation of embedded questions.

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¹I take *wonder* and *ask* to involve true answers in the sense that someone who *asks* or *wonders whether p* is intuitively seeking the true answer to the question *whether p*.

- Puzzle #1: The puzzle of the missing potential answer reading
When predicates like *bil-* embed questions, they give rise to true, but not to potential answer readings.
This observation is unexpected given...
 - * that when *bil-* embeds declaratives, it may give rise to attitude reports that are factive—involving true belief—or to attitude reports that are non-veridical—silent about the truth of the belief (Özyıldız, 2017).²
 - * and that factivity in declarative embedding usually corresponds to true answer readings with questions, and non-veridicality, to potential answer readings (Spector and Egré, 2015).

- Puzzle #2: The puzzle of wanting to *bil-*
All three embedded question types are acceptable under predicates like *merak et-*, ‘wonder,’ and *sor-*, ‘ask.’
In simple sentences, questions introduced by *diye* are not acceptable under predicates like *bil-*, ‘know.’
These improve, however, when *bil-* is further embedded under *iste-*, ‘want.’

(4) Tunçi [kar yağ-dı mı diye] bil-mek istiyor.
Tunçi snow fall-PST POLQ DIYE know-INF wants
Tunçi wants to know whether it snowed.

- While not entirely articulated with each other, both puzzles suggest that the distribution of embedded questions is regulated by the semantic properties of their environment (rather than, e.g., syntactic or semantic selection), and that the veridicality of an attitude report might be one such crucial property.³

2 Puzzle #1: The missing potential answer reading

2.1 Two facts and their consequence

- Fact #1: There is a correspondance between veridicality and true answerhood (Spector and Egré, 2015).
For verbs that embed both declaratives and questions (the *responsives*),

- if the verb is veridical in declarative embedding, it gives rise to true answer readings with questions.

(5) a. Tunçi knows that it was snowy last winter.
 ↔ It was snowy last winter.
 b. Tunçi knows whether it was snowy last winter.
 → If it was snowy, Tunc knows that it was snowy. If it wasn't, Tunc knows that it wasn't.

- if the verb is not veridical in declarative embedding, it gives rise to potential answer readings with questions.

(6) a. Tunçi and Kardi agree that it was snowy last winter.
 ↗ It was snowy last winter.
 b. Tunçi and Kardi agree whether it was snowy last winter.
 ↗ Tunçi and Kardi agree on the true answer.
 Context that makes (6-b) true:
 Although it was snowy last winter, both Tunçi and Kardi came to believe that it wasn't.

²Definitions. For *S* a subject, *V* an attitude verb and *p* a proposition, an attitude report of the form *SVp* is factive iff *SVp* presupposes *p*. (E.g., *John knows/doesn't know that it snowed.* ↔ *It snowed.*) An attitude report of the form *SVp* is veridical iff *SVp* entails, but doesn't necessarily presuppose, *p*. (E.g., *John proved that it snowed.* → *It snowed.*)

³The idea that veridicality and factivity correlate with question embedding is an old one (Hintikka, 1975). The correlation, however, is not perfect (Egré, 2008) or might not exist White and Rawlins (2017). This is to say that more remains to be said in light of the puzzles from today.

- The existence of potential answer readings with verbs like *agree* in (6) suggests that true answerhood does not, in the general case, arise from the semantics of embedded questions (as suggested, e.g., by Karttunen, 1977 and Groenendijk and Stokhof, 1984).
 - One notorious counterexample to the present generalization is *tell*, which is non-veridical with declaratives but gives rise to true answer readings with questions.
- Fact #2: In (languages like) Turkish, factivity alternates (Özyıldız, 2017)
- Attitude reports introduced by the same verb are factive under some circumstances, non-veridical under others.⁴

- (7) a. Nominalized declarative + matrix verb prominence: Factive
 Tunçi [kar yağdığını] {BİLİYOR, HATIRLIYOR}.
 Tunçi snow fall.NMZ knows remembers
 Tunçi {knows, remembers} that it snowed.
- b. Nominalized declarative + embedded prominence: Non-veridical reading available (for some)
 Tunçi [KAR yağdığını] {biliyor, hatırlıyor}.
 Tunçi snow fall.NMZ knows remembers
 Tunçi {believes, has the memory} that it snowed.
- c. *diye* declarative + embedded prominence: Non-veridical
 Tunçi [KAR yağdı diye] {biliyor, hatırlıyor}.
 Tunçi snow fell DIYE knows remembers
 Tunçi {believes, has the memory} that it snowed.
- d. *diye* declarative + embedded prominence: Non-veridical
 Tunçi [kar yağdı diye] {BİLİYOR, HATIRLIYOR}.
 Tunçi snow fell DIYE knows remembers
 Tunçi {believes, has the memory} that it snowed.
- (8) Continuation to (8):
 Ama yanılıyor.
 but he's wrong
 # after (7-a)
 ✓ after (7-b), (7-c) & (7-d)

In previous research I have argued that these predicates are lexically non-veridical and that the factive inference is built up in the composition.

2.2 The puzzle

- The expectation, based on Facts #1 and #2:

If questions can occur with verbs that alternate in factivity, there should arise a true answer reading, like in (5), and a potential answer reading, like in (6).

This expectation is not borne out:

- Examples (9-a) and (9-b) show that questions can occur with *bil-* and *hatırla-*.
- The continuations attempt but fail to bring out a potential answer reading that can be paraphrased as “Tunçi has a belief about whether it snowed.”
 Cf. ✓ “Tunçi has a belief about whether it snowed, but he {could be, is} mistaken.”

⁴While factivity alternates with some verbs, it doesn't with all of them. Verbs like *düşün-* ('think') and *san-* ('believe') always occur in non-veridical attitude reports and *unut-* ('forget') always occurs in factive ones.

- (9) a. Nominalized question + *bil-/hatırla-*: True answer reading
 Tunçi [kar yağıp yağmadığını] {biliyor, hatırlıyor}...
 Tunçi snow fall.IP fall.NEG.NMZ knows remembers
 Tunçi {knows, remembers} whether it snowed.
 (i) #Ama yanılıyor olabilir.
 but mistaken could be
 #But he could be mistaken.
 (ii) #Ama yanılıyor.
 but mistaken
 #But he's mistaken.
- b. Tensed/finite question without *diye* + *bil-/hatırla-*: True answer reading
 Tunçi [kar yağdı mı] {biliyor, hatırlıyor}...
 Tunçi snow fell POLQ knows remembers
 Tunçi knows/has a belief about whether it snowed.
 (i) #Ama yanılıyor olabilir.
 but mistaken could be
 #But he could be mistaken.
 (ii) #Ama yanılıyor.
 but mistaken
 #But he's mistaken.

- Shifting around the position of nuclear stress, which has the effect of bringing out a veridical or a non-veridical reading with declaratives, has no effect on the availability of true vs. potential answer readings with questions.
- Moreover, the *diye* clause strategy that necessarily gives rise to non-veridicality with declaratives is unable to introduce questions with *bil-*, as suggested by (10-a).

The unacceptability of (10-a) isn't due to the fact that *diye* is incompatible with questions. Ex. (10-b) shows that *diye* can introduce questions under verbs like *merak et-*, 'wonder' (the *rogatives*).

- (10) a. Tensed/finite question with *diye* + *bil-/hatırla-*: *
 *Tunçi [kar yağdı mı diye] {biliyor, hatırlıyor}.
 Tunçi snow fell POLQ DIYE knows remembers
 Intended: Tunçi knows/has a belief about whether it snowed.
- b. Tensed/finite question with *diye* + *merak et-*: ✓
 Tunçi [kar yağdı mı diye] merak ediyor.
 Tunçi snow fell POLQ DIYE wonders
 Tunçi wonders whether it snowed.

- The puzzle of the missing embedded question:
 In languages where the same attitude verb V is compatible both with factive and with non-veridical attitude reports, composing V with a question only gives rise to a true answer reading.
- Cross-linguistics: The puzzle of the missing potential answer reading attested in all factivity alternating languages?
 A growing body of languages display factivity alternations similar to the Turkish (7): Bangla (Ishani Guha, Arka Banerjee, p.c.), Buryat (Bondarenko, 2018), Cypriot Greek (Christos Christopoulos, p.c., Djärv, 2017), Hungarian (Anna Szabolcsi, Dóra Kata Takács, p.c.).

In these languages, potential answer readings are also missing with factivity alternating verbs.

2.3 Discussion

- For the sake of simplicity, assume that verbs that alternate in veridicality are ambiguous between a factive and a non-veridical variant.

- (11) a. $\llbracket \text{Tuni bil}_{\text{factive}} \text{ it snowed} \rrbracket = 1$ iff it snowed and Tuni believes that it snowed.
 b. $\llbracket \text{Tuni bil}_{\text{non-veridical}} \text{ it snowed} \rrbracket = 1$ iff Tuni believes that it snowed. .

- Observing a true answer reading suggests that the factive variant is able to embed questions.
- Not observing a potential answer reading suggests that the non-veridical variant is unable to embed questions. Why? Were the non-veridical variant able to embed questions, we would observe a potential answer reading. (We don't observe a potential answer reading, so the non-veridical variant does not embed questions.)

- We know, independently, that there are environments that embedded questions don't like to occur in.

- (12) a. Plain non-veridical verbs display (?) polarity contrasts:
 (i) %Tuni is certain whether it's snowing.
 (ii) Tuni isn't certain whether it's snowing.
 b. Neg-raising non-veridical verbs never embed questions:
 *Tuni believes whether it's snowing.

Mayr (2018) offers an account for the 'be certain' contrast.

Mayr (2018) and Theiler et al. (2017) offer similar accounts for the *believe wh- puzzle.

These accounts have follow a general schema:

- The attitude verb has a semantic contribution,
- The embedded question has a semantic contribution,
- Putting those two together sometimes gives rise to logical triviality: The resulting sentence is always true, or always false,
- Logical triviality is perceived as ungrammaticality (Gajewski, 2002).

- Perhaps the impossibility of question embedding under the non-veridical variant of alternating predicates could be reduced to the *(not) be certain wh-' case or to the *believe wh-' case.

BUT if we can show that *bil-* patterns differently from 'be certain' and from 'believe,' we can be confident that the puzzle of the missing potential answer reading doesn't reduce to those cases.

- Triviality by exhaustification: The case of 'be certain'

Perhaps potential answers with *bil-* are only observed when *bil-* is negated. Just like potential answers under 'be certain' are observed only (?) when 'be certain' is negated.

- (13) a. John isn't certain who won the race. #He thinks it was Elvan.
 (i) NOT [there's a potential answer to "Who won?" that John believes]
 (ii) John believes that Elvan won.
 \Rightarrow Contradiction. (‘be certain’ is about potential answers)
- b. John doesn't know who won the race. ✓He thinks it was Elvan.
 (i) NOT [John believes the true answer to "Who won?"]
 (ii) John believes that Elvan won.
 \Rightarrow Not a contradiction. (‘know’ is about true answers)

But, Turkish *emin ol(ma)*-, ‘(not) be certain’ and *bil-*, ‘know,’ pattern like their English counterparts. The acceptability of (14-b) suggests that embedded questions under *bil-* give rise to true answer readings.

- (14) a. Tunçi [yarış kimin kazandığından] emin değil. #Elvan kazandı sanıyor.
 Tunçi race who won confident NEG Elvan won he believes
 Tunçi isn’t certain who won the race. #He thinks it was Elvan.
- b. Tunçi [yarış kimin kazandığını] bilmiyor. ✓Elvan kazandı sanıyor.
 Tunçi race who won know.NEG Elvan won he believes
 Tunçi doesn’t know who won the race. ✓He thinks it was Elvan.

- Triviality by excluded middle: The case of ‘believe’

The reason that verbs like ‘believe’ aren’t thought to embed questions is because they’re neg-raising.

- (15) a. Neg-raising verbs:
 John doesn’t believe that it’s snowing.
 Strongly implies: John believes that it’s not snowing.
- b. Non-neg-raising verbs:
 John didn’t say that it’s snowing.
 Does not imply: John said that it’s not snowing.

Turkish has neg-raising constructions:

- (16) Nominalization + negated *san-* & *düşün-*: Neg-raising
- a. Tunçi [kar yağdığını] {sanmıyor, düşünmüyor}.
 Tunçi snow fall believe.NEG think.NEG
 Tunç doesn’t believe/think that it’s snowing.
- b. Sen de katılıyor musun?
 Do you agree? The “Do you agree?” test (Collins and Postal, 2014)
 (Speaker is asking whether addressee also believes that it’s not snowing.)

But, verbs that participate in veridicality alternations do not give rise to the neg-raising inference.

- (17) The “Do you agree?” test on *bil-*:
- a. #Ben [kar yağdığını] bilmiyorum. Katılıyor musun?
 I snow fall know.NEG do you agree
 I don’t know that it’s snowing. Do you agree?
- b. #Ben [kar yağdı diye] bilmiyorum. Katılıyor musun?
 I snow fall DIYE know.NEG do you agree
 My belief is not that it’s snowing. Do you agree?
- (18) a. Tunçi’nin kar yağıp yağmadığı hakkında bir düşüncesi yok.
 Tunçi doesn’t have any thoughts about whether it’s snowing.
- b. Hayir var. [Kar yağdığını] düşünmüyor.
 no he does snow fall think.NEG
 Yes he does. He doesn’t think that it’s raining.

- (19) a. Tunçi'nin kar yağıp yağmadığı hakkında bir bilgisi yok.
Tunçi doesn't have any information/knowledge about whether it's snowing.
- b. (i) #Hayir var. [Kar yağdığını] bilmiyor.
no he does snow fall know.NEG
- (ii) #Hayir var. [Kar yağdı diye] bilmiyor.
no he does snow fall DIYE know.NEG
Intended: Yes he does. He has the information/knowledge that it didn't.

Take away from the puzzle of the missing potential answer reading:

- While verbs like *bil-* and *hatırla-* are factive or non-veridical with embedded declaratives, they don't seem to give rise to potential answer readings.
- One hypothesis is that the non-veridical embedding strategy has a property P that creates a problem with the semantics of embedded questions. That property doesn't seem to be non-veridicality simpliciter or neg-raising.
- Another hypothesis is that there is a property P that the factive embedding strategy has that licenses embedded questions. Is the property P factivity simpliciter or something that includes factivity?

3 Puzzle #2: Want to *bil-*

- The second puzzle concerns the distribution of embedded questions introduced by *diye*.
As shown in (20), these can occur with predicates like *merak et-*, 'wonder,' and *sor-*, 'ask.'

- (20) Tunçi [annesi geldi mi diye] {merak ediyor, sordu}.
Tunçi his mother came POLQ DIYE wonders, asked
Tunçi {wonders, asked} whether his mother arrived.

- However, questions introduced by *diye* do not occur under predicates like *bil-*, 'know,' or *hatırla-*, 'remember.'

- (21) *Tunçi [annesi geldi mi diye] {biliyor, hatırlıyor}.
Tunçi his mother came POLQ DIYE knows, remembers
Intended: Tunçi {knows, remembers} whether his mother arrived.

- An initial hypothesis is that selection might be involved: Questions introduced by *diye* might not be the kind of syntactic or semantic object that verbs like *bil-* or *hatırla-* prefer to merge or compose with.

However, this hypothesis is difficult to maintain in light of (22).

In (22), *bil-* and *hatırla-* are further embedded under *iste-*, 'want,' and *çalış-*, 'try.' Then, questions introduced by *diye* may occur with *bil-* and *hatırla-*.

Hypotheses based on selection are difficult to maintain because the selectional properties of a predicate shouldn't depend on whether it is embedded under 'want' or 'try.'

- (22) a. Tunçi [annesi geldi mi diye] {bilmek, hatırlamak} istiyor.
Tunçi his mother came POLQ DIYE know.INF remember.INF wants
Tunçi wants to know/remember whether his mother arrived.
- b. Tunçi [annesi geldi mi diye] hatırlamaya çalışıyor.
Tunçi his mother came POLQ DIYE know.INF tries
Tunçi is trying to remember whether his mother arrived.

- While embedding declaratives with *diye* seems to be a dedicated non-veridical strategy, embedding questions with *diye* gives rise to a kind of true answer reading.

The examples in (22) entail that the attitude holder is seeking the true answer to the question.

(23) Tunçi wants to *bil-* whether it's raining.

- Entails: Tunçi is seeking the true answer.
- Not: Tunçi is seeking any answer (\approx wants to form any belief about whether it's raining).

- What is going on? One hypothesis that I would like to explore is that

- *diye* questions are picky about the environments they occur in,
- while *bil-* or *hatırla-* alone do not create the right kind of environment,
- but, the addition of ‘want’ and ‘try’ do.

- (24) a. *[bil- Q]
 b. ✓[want ... [bil- Q]]

- A precedent in the literature: Embedded inversion in English McCloskey (2006), via Dayal and Grimshaw (2009)

- (25) a. Who was she dancing with at the party?
 b. They wondered who was she dancing with at the party.
 c. *They know who was she dancing with at the party.
 d. They wanted to know who was she dancing with at the party.

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