

When-questions and tense in Inquisitive Semantics

The Present Perfect Puzzle is about the compatibility of the present perfect (PrP) with past time adverbials in various languages [5, 9]. This paper shows that a similar distributional puzzle exists for *when*-questions. Temporal questions have been understudied in semantic frameworks for interrogatives, such as Inquisitive Semantics [3], yet they offer important insights into the role of tense and aspect in the interpretation of questions, as will be shown. The contribution of the current paper is twofold: accounting for the cross-linguistic distribution of PrP in *WHEN*-questions, and showing why an inquisitive perspective on tense is needed, including a formal implementation of tense and aspect in Inquisitive Semantics, which has not been done before.

English *when*-questions are incompatible with the present perfect (cf. [5]), except for non-temporal (“rhetorical”) *when*-questions, see (9). On the other hand, Dutch (2) and German present perfect *WHEN*-questions are fully grammatical.

- (1) a. When did you read the book? (2) Wanneer heb je dat boek gelezen?
b. *When have you read the book? when have you that book read?

English PrP *WHEN*-questions are improved somewhat under an existential reading, which carries a suggestion of multiple/iterated events, but are not fully acceptable for most speakers:

- (3) ?When have you been in America? [existential reading; suggests multiple visits]

The English distribution is supported by corpus findings and native speaker judgments. The only previous formal semantic analysis of *when*-questions is [8], but it explicitly ignores the role of tense and aspect. These will be shown to be crucial, and are implemented in our proposed analysis.

Claim 1: The domain of a *WHEN*-question may not contain the speech time.

Present tense *WHEN*-questions are acceptable, unless the present tense refers to the speech time (henceforth ‘current present’). This holds for both English and Dutch.

- (4) When does Mary sing? (fine as futurate or habitual reading, not as current present)
#When is John sick? (unacceptable as current present)

This is explained by a general constraint that questions which have already been partially resolved in the discourse should be marked as such, for example with additive *else* in (5):

- (5) [You cooked a 3-course dinner. We’ve just had the starter, which was soup. I then ask:]
#What did you cook? ✓What **else** did you cook?

WHEN-questions ask for the running time of an event, and when the left or right boundary of that interval is known in the discourse, the answer counts as partially resolved. In that case, according to the constraint, an unmarked *WHEN*-question is ruled out, similar to (5). An example of a known left boundary is in (10). In current present *WHEN*-questions, the right boundary is asserted to be the speech time, and ruled out by the same constraint; see (11) for a Dutch example.

Claim 2: Tense and aspect of the question determine the domain and answerhood conditions.

Simple past and future *when*-questions only ask about past and future events, respectively. Viewpoint aspect determines the relation between the requested answers and the event time. Improving on [8], the effects of tense/aspect follow compositionally for simple past and future *when*-questions, with the following entry for ‘when’ (*?e* is the question operator as defined in [8]):

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| <p>(6) $\llbracket \text{PFV} \rrbracket = \lambda P_{vt} \lambda t_i . \exists e (P(e) \ \& \ \tau(e) \subseteq t)$
 $\llbracket \text{PAST} \rrbracket = \lambda P_{it} \lambda t'_i . t' < t_c \ \& \ P(t')$
 $\llbracket \text{when} \rrbracket = \lambda P_{it} . ?e [P(\tau(e))]$</p> | <p>[when [PAST [PFV [vP John sing]]]]
 $?e [\tau(e) < t_c \ \& \ \exists e' (\text{sing}(e', j) \ \& \ \tau(e') \subseteq \tau(e))]$
 $\tau(e) = \text{running time of event } e; t_c = \text{speech time}$</p> |
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Thus, the question requests answers that specify events e that occurred in the past (first conjunct, Tense), and which include a singing event (PFV Aspect), as desired. For why WHEN-questions ask about events, not times, see [8]; nothing crucial hinges on this choice.

Claim 3: for PrP WHEN-questions, the domain of WHEN is the Perfect Time Span (PTS).

Answers to Dutch PrP WHEN-questions specify the event time, not the time of speech or of the result state; see (12) (something similar holds for the English existential readings (3), details of this part of the proposal are left out for reasons of space, but cf. the iterative reading in (13)). However, when the perfect is defined to existentially quantify over a PTS (as in e.g. [9]), we get (7b):

- (7) a. $\llbracket \text{PERFECT} \rrbracket = \lambda P_{it} . \lambda t_i [\exists t^* (t^* R t \ \& \ P(t^*))]$ from [9]; R specifies a PTS relation
b. Present perfect WHEN-question: $?e [\tau(e) = t_c \ \& \ \exists t^* (t^* R \tau(e) \ \& \ \exists e' (P(e') \ \& \ \tau(e') \subseteq \tau(e)))]$

This predicts that PrP WHEN-questions have the domain contributed by PRESENT tense (equal to t_c , marked gray), and thus that PrP WHEN-questions behave like current present ones. For English, this is correct, as both types of *when*-questions are ruled out. However, it is incorrect for Dutch, since that language allows PrP WHEN-questions, but not current present ones.

Instead, the relevant cross-linguistic difference is the nature of the PTS. As shown in [10], in English (and Swedish), the PTS must reach up to the speech time, and thus disallows PrP WHEN-questions (right boundary is known; cf. Claim 1). In German and Dutch, the PTS may lie fully in the past, and allows PrP WHEN-questions. WHEN-questions thus constitute a novel argument for the idea that Dutch/German PrPs have a reading that semantically behaves like a simple past. Yet, in general, Dutch WHEN-questions are incompatible with the (syntactically realized) simple past, (8):

- (8) *Wanneer las je dat boek? [lit. When read_{PAST} you that book?; a PrP is required here in Dutch]

To understand this, we take an inquisitive view on tense.

Tense in inquisitive semantics The existence of WHEN-sluices (14) (sluices are seen as a diagnostic for inquisitive content [1]) suggests that certain tense operators are inquisitive, but tense operators differ in inquisitive strength cross-linguistically. Dutch/German simple past tense is anaphoric (cf. (15)), and not inquisitive. The anaphoric nature narrowly specifies the event time, rendering it incompatible with WHEN. English simple past, however, is not anaphoric (cf. (15)), and allows WHEN-questions. Hence, the anaphoric-inquisitive contrast is crucial for tense use in WHEN-questions.

Finally, and as a more general contribution, we show how tense and aspect can be implemented in Inquisitive Semantics. Providing just very few details here, we start from the compositional, typed framework of inquisitive semantics [3], and adding times and events to the ontology. Now we can define, using [3]’s notation, inquisitive operators (counterparts of classical $\exists e$ and $\exists t$): $\llbracket \text{PST} \rrbracket = \lambda P_{i,T} . \bigcup_{t:t < t_c} P(t)$, $\llbracket \text{PFV} \rrbracket = \lambda P_{v,T} \lambda t_i \bigcup_{e:\tau(e) \subseteq t} P(e)$, and $\llbracket \text{when} \rrbracket = \lambda P_{i,T} . \bigcup_e P(\tau(e))$. One may worry about this making every tensed clause inquisitive (they have alternatives for every t/e in some domain). This can be solved by inserting projection operators, as in (16ab), similar to the existing practice of ‘suppressing alternatives’ in disjunctive polar questions (16c), see [2]. However, the time-based alternatives are needed in WHEN-questions and WHEN-sluices. This offers a novel, inquisitive perspective on the quantificational vs. anaphoric nature of tense operators.

Additional examples

- (9) Non-temporal (“rhetorical”) *when*-questions allow PrP
a. **Since** when has Turkey been part of Europe? (Europarl corpus, see [4] for *since when*)
b. When have we **ever** needed an excuse to grab a gin & tonic? (iWeb corpus)
- (10) [John was sick, but is healthy now. We know that he became sick on Feb 3rd.]
#When was John sick? ✓**Until** when was John sick?
- (11) #Wanneer is Jan ziek? ✓**Sinds** wanneer is Jan ziek?
when is John sick? since when is John sick (no rhetorical reading in Dutch)
- (12) Dutch PrP *when*-questions are answered by event time
Wanneer heeft Jan het boek gelezen? [lit. ‘When has John read the book?’]
a. ✓ In de zomervakantie. [In the summer holiday]
b. #Gisteren om 5 uur. [Yesterday at 5pm] c. #Nu. [Now]
- (13) Existential PrP *where*-question suggest iteration, similar to (3)
Where have the police arrested the suspect? (existential reading; example from [7])
“appropriate response: *He has been arrested in Berkeley, in Walnut Creek, etc.*” [7, p. 145]
- (14) Mary arrived, but I don’t remember when.
- (15) Anaphoric simple past in Dutch (and German)
[standing in front of a church] English: Who built this church? (from Kratzer [6])
*Wie bouwde deze kerk? ✓Wie heeft deze kerk gebouwd?
who built this church who has this church built
- (16) a. Mary came. !PST(PFV(Mary come))
b. Did John come? ?!PST(PFV(John come))
c. Does John-or-Bill[↑] come? ?!((John come) ∨ (Mary come)) see [2]

References

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