Indirect evidentiality deriving from temporal uncertainty: the case of Japanese *goro*

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Introduction and data. This paper addresses a hitherto-unnoticed observations about *goro* 'around' in Japanese, which expresses temporal approximation: *san-zi goro* (*san-zi* 'three hour' plus *goro*) means 'around 3:00'. I focus on the case where *goro* combines with *ima* 'now':

(1) Ima-goro ame-ga huttei-ru (daroo).
now-around rain-NOM falling-PRES (must)
'(Lit.) It is (must be) raining around now.'

(1) is a bit unnatural, but far from unacceptable, without the modal *daroo* 'must'. What is of note is that when *goro* combines with *ima* 'now', it expresses indirect evidentiality (Aikhenvald 2004), i.e., that the speaker is not witnessing the predicate event directly. Compare (2a) and (2b):

(2) (You are seeing falling raindrops. A friend phones you and asks how the weather is. You say:)

a. #Ima-goro ame-ga huttei-ru.
now-around rain-NOM falling-PRES
'(Lit.) It is raining around now.'

b. Ima ame-ga huttei-ru.
now rain-NOM falling-PRES
'It is raining now.'

This effect is not observed when *goro* combines with other time expressions. In (3), the speaker directly witnessed raining and the use of *goro* is perfectly natural.

(3) (You saw falling raindrops from a window around 3:00 PM. Several hours later, a friend asks you how the weather was today. You say:)
San-zi goro ame-ga huttei-ta.
three-hour around rain-NOM falling-PAST
'It was raining around 3:00.'

This paper is the first attempt to provide a formal analysis on this contrast.

Analysis I assume that propositions are true of time intervals (sets of moments) and possible worlds, that the semantics of past/present tenses is as in (4) (I adopt the existential view of past tense, but this is purely for expository purposes; my analysis can be implemented under Partee's (1973) pronominal view), and that the interval and worlds slots that are open at the end of the composition are saturated with the utterance time UT and the actual world $w_@$.

(4) $[\![\text{PRES}]\!] = \lambda p.\lambda t.\lambda w.\ p(w)(t)$. / $[\![\text{PAST}]\!] = \lambda p.\lambda t.\lambda w.\ \exists t'[t' < t \wedge p(w)(t')]$

I argue that *goro* expresses the speaker's uncertainty on the truth of the prejacent:

(5) a. $[\![goro]\!] = \lambda t.\lambda p.\lambda t'.\lambda w.\ t = t' \wedge \exists t'',\ T[t \subset T \wedge t'' \subseteq T \wedge p(t'')(w)]$, defined only if $\exists w'[w' \in K_{sp} \wedge \neg p(t)(w')]$.

b. $K_{sp} = \{w:\ w$ is compatible with what the speaker knows at UT in $w_@\}$

Let us begin with the meaning of (3). I assume that (3) has the LF in (6a) and *san-zi* simply denotes the time **3:00**. (6b) provides (3) without the tense, and (6c) is the whole meaning:

(6) a. LF of (3): [[[saniz-zi goro] ame-ga huttei]PAST]

b. $[\![sanzi\text{-}goro\ ame\text{-}ga\ huttei]\!] = [\![goro]\!]([\![san\text{-}zi]\!])([\![ame\text{-}ga\ huttei]\!])$
$= \lambda t'.\lambda w.\ \mathbf{3:00} = t' \wedge \exists t'',\ T[\mathbf{3:00} \subset T \wedge t'' \subseteq T \wedge \mathbf{raining}(t'')(w)]$, defined only if $\exists w'[w' \in K_{sp} \wedge \neg \mathbf{raining}(\mathbf{3:00})(w')]$.

c. $[\![(3)]\!] = [\![\text{PAST}]\!]([\![sanzi\text{-}goro\ ame\text{-}ga\ huttei]\!])$
$= \lambda t.\lambda w.\ \exists t'[t' < t \wedge \mathbf{3:00} = t' \wedge \exists t'',\ T[\mathbf{3:00} \subset T \wedge t'' \subseteq T \wedge \mathbf{raining}(t'')(w)]$, defined only if $\exists w'[w' \in K_{sp} \wedge \neg \mathbf{raining}(\mathbf{3:00})(w')]]$.

After t and w in (6c) are replaced by UT and $w_@$, it means that **raining** is true at t'' in w, where t'' is a part of T, which contains **3:00**. That is, **raining** is true at an interval around **3:00**. The

defining conditions (underlined) requires that it is possible in terms of the speaker's knowledge that **raining** is false at t = **3:00**. Given that the truth-conditional part says that **raining** is actually true, the defining condition amounts to say that it was raining but the speaker is not certain about whether it was raining exactly at 3:00. Therefore, (6c) is compatible with the context in (3), where the speaker directly knows that it was raining.

If (2a) has the LF in (7a), it has the meaning in (7b) (I assume *ima* 'now' in (2a) to denote UT):

(7) a. LF of (2a): [[[ima goro] ame-ga huttei]PRESENT]

b. $[\![\text{(2a)}]\!] = [\![\textsc{present}]\!]([\![\textit{goro}]\!])([\![\textit{ima}]\!])([\![\textit{ame-ga huttei}]\!]))$
$= \lambda t'.\lambda w.\ \text{UT} = t' \wedge \exists t'', T[\text{UT} \subset T \wedge t'' \subseteq T \wedge \textbf{raining}(t'')(w)]$, defined only if $\underline{\exists w'[w' \in K_{sp} \wedge \neg \textbf{raining}(\text{UT})(w')]}$.

The indirect evidentiality derives from the underlined defining condition. If you are now seeing rain, in contrast to when talking about the past, you cannot be uncertain about whether **raining** is true at UT in $w_@$. Therefore, as long as the speaker describes the event she is seeing, the uncertainty condition (underlined) cannot be satisfied. Thus, *ima goro* is incompatible with the context where the speaker directly witnesses the described event. If the speaker is not seeing rain, she can be uncertain about whether it is really raining at UT, satisfying the uncertainty condition.

However, (7b) is insufficient in that its truth conditions say that it is raining but the defining condition expresses the speaker's uncertainty on that, like saying"It is raining but it might not be". I claim that a covert modal MOD, which has the same meaning as *daroo* in (8a), is inserted as a last resort to remedy this. Thus, (8b) is the real LF of (2a). This yields (8c), where the truth-conditions do not require **raining** to be true in $w_@$. This analysis captures the subtle unnaturalness of (1) without *daroo*: it degrades because the covert modal as a last resort is used where *daroo* can be.

(8) a. $[\![\textsc{mod}]\!] = [\![\textit{daroo}]\!] = \lambda p.\lambda w.\lambda t.\ \forall w'[w' \in \textsc{best}(w) \rightarrow p(w')(t)]$, where $\textsc{best}(w)$ is the set of best epistemically accessible worlds in w in the sense of Kratzer (1981).

b. [[[[ima goro] ame-ga huttei]PRESENT]MOD]

c. $[\![\text{(2a)}]\!] = [\![\textsc{mod}]\!]([\![\textsc{present}]\!]([\![\textit{goro}]\!]([\![\textit{ima}]\!])([\![\textit{ame-ga huttei}]\!])))$
$= \lambda w.\lambda t.\ \forall w'[w' \in \textsc{best}(w) \rightarrow [\text{UT} = t' \wedge \exists t'', T[\text{UT} \subset T \wedge t'' \subseteq T \wedge \textbf{raining}(t'')(w')]]]$, defined only if $\exists w''[w'' \in K_{sp} \wedge \neg \textbf{raining}(\text{UT})(w'')]$.

The current analysis of *ima goro* straightforwardly derives the acceptability of (9). Although *ima goro* is used, (9) talks about the past. Therefore, it is compatible with the speaker's direct perception of rain for the same reason as (3). (*ima* in (9) denotes *the same time* instead of UT.)

(9) (You saw falling raindrops at 3:00 yesterday. Now it's 3:00, and you say:)
Kinoo-no ima goro ame-ga huttei-ta
yesterday-GEN now around rain-NOM falling-PAST
'It was raining this time yesterday.'

Remaining issues First, *ima goro* has another usage. In (10), *ima goro* is used to express that John's arrival is too late. Whether and how the current analysis can be extended to this usage remains to be explored. Secondly, the English *by now* exhibits indirectness like *ima goro* (Altsuler and Michaelis 2020). In Japanese, however, *ima* plus *madeni* 'by' means 'up to now', as in (11). This difference between English and Japanese is another remaining issue.

(10) John-ga ima goro ki-ta.
John-NOM now around come-PAST
'John came to the party, which is too late.'

(11) Ima-madeni go-nin ki-ta.
now-by 5-people come-PAST
'Five people have come up to now'

Sel. references Aikhenvald, A. (2004) *Evidentiality*, OUP. Altsuler, D. and L. A. Michaelis (2020) "*By now*: Change of state, epistemic modality and evidential inference" *J. Linguistics* 56: 515-539.