What makes *by now* in Japanese differ from *by now* in English

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Abstract The temporal use of the English preposition *by* is often translated into the Japanese expression *madeni*. Both of the two exhibit the same meaning, but *by now* can co-occur with a predicate that denotes the current state (e.g., *be home*), while the combination of *madeni* and *ima* 'now' cannot. This paper accounts for this contrast by focusing on what condition has to be satisfied to license *madeni*. There are two environments in which *madeni* can occur: (i) when it is clearly specified how many times the event described by the matrix predicate occurs, or (ii) when the whole sentence expresses a modality of certain kinds (e.g., schedule). From these observations, the licensing condition for *madeni* is derived: the sentence containing *madeni* must sufficiently affect the temporal duration provided by *madeni*-phrase, rather than affecting a particular time interval. It is also illustrated that the same condition is applicable to *ima-madeni*. That is, the difference between *by now* and *ima-madeni* is the absence/presence of the licensing condition.

Keywords semantics, time expressions, temporal use of by, event plurality, modality,

1. Introduction

In English, the preposition *by* has a temporal use whose meaning is similar to "no later than", exemplified below:

(1)   John submitted an assignment by the deadline.

I refer to this use of *by* as By Temporal Adjunct (BTA), following Thomas & Michaelis (2009) and Altshuler & Michaelis (2020) (henceforth, A&M). A BTA is often translated into Japanese using *madeni*. A literal translation of (1) is as follows:[1, 2]

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[1] *Madeni* can be considered as consisting of two lexical items: a noun *made* and a postposition *ni*. While it is desirable if the meaning of *madeni* can be derived from that of *made* and *ni* in a compositional fashion, I put this issue aside and assume that *madeni* is a single lexical unit throughout this paper.

[2] *Madeni* can take either a noun or a clause as its complement, the latter of which case is exemplified below:

(i)   John-wa   sotugyoo-suru madeni TOEFL-de manten-o   tot-ta.
       John-NOM graduation-do by   TOEFL-in perfect.score-ACC get-PAST

       'John had gotten a perfect score on the TOEFL by the time he graduated.'

Throughout this paper, I focus on the cases where *madeni*'s complement is a noun to maintain the parallelism with the preposition *by*.

In addition, *madeni* has another, relatively minor use that expresses excessiveness:

(2) John-wa kigen-madeni kadai-o teisyutu-sita.
John-TOP deadline-by assignment-ACC submit-PAST

'John submitted an assignment by the deadline.'

In most case, *madeni* can be used where BTA can. However, *madeni* exhibits completely different behavior when combining with *ima* 'now'. According to A&M, *by now* can co-occur with a predicate that simply describes the current state of affair:

(3) Shira is home by now. = (A&M's (14))

(3) signals not only that Shira is home now, but also that the speaker does not directly witness Shira being home (so-called *indirect evidentiality*), which is an implication that *Shira is home now* does not express. Meanwhile, *madeni* is incompatible with predicates describing current states:[3]

(4) #Saki-wa ima-madeni ie-ni iru.
Saki-TOP now-by home-at be.PRES

'Saki is home by now'

The purpose of this paper is to analyze why (4) is unacceptable while *by* and *madeni* seem to have similar meaning.

One might suppose that the infelicity of (4) is not attributed to the semantic property of *madeni*, but to Japanese tense expressions in general; it might be suggested that *ima-madeni* refers to a past event, which is incompatible with the present tense predication in (4). However, the present tense predication in Japanese can co-occur with several adverbs that refer to the past:

(5) Saki-wa mou/sudeni ie-ni iru.
Saki-TOP already home-at be.PRES

'Saki is already home.'

The adverb *mou* and *sudeni* (both of which are similar to 'already') typically expresses that the action described by the predicate has been done at the reference time. Nevertheless, they are compatible with present tense predication. Given this, the infelicity of (4) cannot simply

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(ii) John-no kenkyuu-wa sensei-o odorokaseru madeni hattensi-ta.
John-GEN research-TOP professor-ACC surprise by progress-PAST

'John's research progressed to such an extent that the professor was surprised.'

In this case, the *madeni* clause implicates that the professor's surprise is an overwhelming result. This usage of *madeni* is also put aside in this paper.

[3] The Japanese *goro*, which expresses temporal approximation as in *sanzi goro* 'around three o'cklock', shows the same effect as *by* when combined with *ima* 'now':

(i) Saki-wa ima-goro ie-ni iru.
Saki-TOP now-around home-at be

'Saki is home around now'

This sentence sounds weird if the speaker says it while seeing Saki at home. Why an expression of temporal approximation derives indirect evidentiality is left to future research.

be reduced to the fact that *ima-madeni* refers to a past event.

The rest of this paper is organized as follows. Section 2 reviews several previous studies on *by now* and *madeni*, and points out that the two expression share the same aspectual restriction in common. Section 3 addresses in what environment *madeni* is licensed. We observe that *madeni* is licensed either when the number of occurrences of the described event is specified explicitly or when the whole sentence accompanies a modality of a certain kind. Furthermore, I claim that *madeni* is licensed when the sentence sufficiently affects the temporal duration provided by the *madeni*-phrase. Section 4 demonstrates that the licensing condition for *madeni* can be applied to *ima-madeni*. Section 5 concludes the paper.

2. Previous studies on *by* and *madeni*
2.1. *By now*: Altshuler & Michaelis (2020)

Altshuler & Michaelis (2020) argue that the predicate co-occurring with a BTA must denote a change of state, given that BTAs are readily compatible with achievements accomplishments, but not with activities and states:[4]

(6) a. They arrived by Friday.   = (A&M's (7))

     b. She cleaned out her locker by Monday.   = (A&M's (8))

     c. ?She walked around by noon.   = (A&M's (9))

     d. ?She loved hot toddies by November.   = (A&M's (10))

When BTAs co-occur with stative predicates as in *Ava was home by Friday*, the addressee is required to retrieve a contextually prominent event that causes the state denoted by the predicate (e.g., Ava's arriving).

Given these observations, A&M propose the following semantics for the BTA *by Friday*, where *P* is an event/state predicate:

(7) $[\![$ *By Friday P* $]\!]$ =

     a. there is a contextually salient resultant state s_i such that a *P*-event causes s_i and the onset time of s_i comes at least as early as Friday. (when *P* is eventive)

     b. there is a contextually salient event e_i such that e_i causes a *P*-state and the onset time of that *P*-state comes at least as early as Friday. (when *P* is stative)

With this semantics, *Shira is home by now* denotes the following (note that *be home* is stative):

(8) $[\![$ *Shira is home by now* $]\!]$ = there is a contextually salient event e_i such that e_i causes Shira to be home and the onset time of Shira being home comes at least as early as now.

According to A&M, the indirect evidentiality of this sentence is derived by the following reasoning. If the speaker knew Shira's exact arrival time, she would use a past-tensed report like *Shira came home at 5*. However, her actual utterance is a more indefinite claim that is similar to *Shira came home at some time prior to now*. This means that she lacks knowledge of when Shira arrived home.

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[4] Thomas & Michaelis (2009) claim that BTAs require stative predicates. What the two previous studies have in common is that a certain resultant state must hold at the time denoted by the complement of *by*.

2.2. *Madeni*: Kudo (1992)

Kudo (1992) claims that *madeni* can only co-occur with the non-progressive form of what she calls *undō dousi* 'active verb' which is nearly identical to the verb groups of achievements and accomplishments combined.[5] See below:

(9) Nimotu-wa   itumo   nitibotu-madeni tuku/?aru
     package-TOP always sunset-by   arrive.PRES/exist.PRES
     'Packages always arrive/??exist by sunset.'

The achievement *tuku* 'arrive' is compatible with *madeni* while the state *aru* 'exist' sounds relatively odd. However, the combination of *madeni* and stative predicates can be (at least marginally) acceptable:

(10) (?)Rokuzi-madeni ie-ni   iru-yooni.
          six.hour-by   home-at be-IMP
          'Be home by six o'clock.'

This example is acceptable insofar as there is a contextually salient event that causes the addressee to be home before six o'clock, and the predicate *iru* describes such a resultant state. This is exactly how *Ava was home by Friday* is interpreted.

These observations suggest that *by* and *madeni* impose the same aspectual restrictions on the co-occurring predicate. Then, the fact that *ima-madeni* is incompatible with predicates denoting current states while *by now* is not (as in (3) and (4)) should be attributed to another factor. The next section explores a semantic restriction that *madeni* imposes on the sentence to which it is attached.

3. Licensing *madeni*: Clarification of the number of event occurrences or sentence modality

This section explores conditions that enable the use of *madeni*, and proposes that it is licensed (i) when the sentence clarifies how many times the predicate event occurs, or (ii) when the sentence conveys, whether explicitly or implicitly, that a certain modality (e.g., obligation, schedule, expectation, etc.) is established regarding the described event.

3.1. Clarification of the number of event occurrences

Let us begin with the following sentences:

(11) a.??John-wa   nenmatu-madeni ziko-ni   at-ta.
          John-TOP end.of.year-by   accident-with encounter-PAST
          'John had an accident by the end of the year.'

      b.??Yuki-ga   nenmatu-madeni hut-ta.
          snow-NOM end.of.year-by   fall-PAST
          'It snowed by the end of the year.'

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[5] Yabuzaki (2014) discusses cases where *madeni* takes a clause as its complement, and argues that several temporal constraints are imposed between the matrix and embedded clauses. I do not elaborate on her analysis because this subsection focuses specifically on the aspectual restriction imposed by *madeni*.

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The predicates in these examples are not stative; nevertheless they sound unnatural out of the blue. Compare them with the following acceptable variants:

(12) a. Doraibaa-ga hyaku-nin nenmatu-madeni ziko-ni at-ta.
     driver-NOM hundred-people end.of.year-by accident-with encounter-PAST
     'A hundred drivers had an accident by the end of the year.'

   b. Yuki-ga nenmatu-madeni ik-kai hut-ta.
     snow-NOM end.of.year-by one-time fall-PAST
     'It snowed once by the end of the year.'

Clearly, the difference between (11a)/(11b) and (12a)/(12b) is the absence/presence of the explicit reference to the number of the occurrences of the event described; (12a) and (12b) explicitly convey how many times the relevant event occurred during a contextually salient duration whose endpoint is the end of the year.

3.2. Certain modalities

In (2), repeated here as (13), there is no indication of the number of assignments John submitted, yet it is perfectly acceptable unlike (11a) and (11b):

(13) John-wa kigen-madeni kadai-o teisyutusi-ta.
     John-TOP deadline-by assignment-ACC submit-PAST
     'John submitted an assignment by the deadline.'

I claim that (13) is acceptable because it can be easily inferred that John's submission is a scheduled event, while it is inconceivable to assume that having an accident and snowing are scheduled events, so (11a) and (11b) are unacceptable. This subsection argues that establishment of such a modality is also a licensing condition for *madeni*. Note that the acceptable case in (9) describes a scheduled event, i.e., the shipping of packages.

The modality licensing *madeni* is not limited to schedule. I propose that *madeni* is licensed when the occurrence of the predicate event is obligated, scheduled, expected, desired, or undesired (in (10), being home is obligated).[6] Although in (2) and (9), the relevant modality is expressed implicitly, that is, by invoking relevant parts of our world knowledge (i.e., submission of an assignment and shipping of packages are usually scheduled), explicit modality markers also license *madeni*. Consider the following sentences.

(14) a. John-wa nenmatu-madeni ziko-ni awa-nakerebanaranakat-ta[Obligated]
     John-TOP end.of.year-by accident-with encounter-must-PAST
     'John should have had an accident by the end of the year.'

   b. Yotei-doori John-wa nenmatu-madeni ziko-ni at-ta. [Scheduled]
     plan-according.to John-TOP end.of.year-by accident-with encounter-PAST
     'As planned, John had an accident by the end of the year.'

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[6] Teramura (1983) pointed out that *madeni* frequently co-occurs with "emotive expressions such as volition, commands, desires, and invitations". His observation is in line with the current claim, but he did not argue that these expressions function as licensors of *madeni*.

    c. Yuki-ga   nenmatu-madeni huru daroo.   [Expected]
       snow-NOM end.of.year-by   fall   will
       'It will snow by the end of the year.'

    d. Saki-no   nozomi-doori   yuki-ga   nenmatu-madeni hut-ta.   [Desired]
       Saki-GEN wish-according.to snow-NOM end.of.year-by   fall-PAST
       'As Saki hoped, It snowed by the end of the year.'

    e. Yuki-ga   nenmatu-madeni hut-tesimat-ta.   [Undesired]
       snow-NOM end.of.year-by   fall-TESIMAU-PAST
       'Unfortunately, it snowed by the end of the year.'

In (14a), the deontic modal *must* expresses that John was obliged to have an accident. This sentence can be uttered when John needed to deliberately get into an accident to claim insurance money for repaying his debt, but the insurance was scheduled to expire by the end of the year. The presence of the modal marker makes the sentence sound much more natural than (11a). (14b), which accompanies *as planned*, is acceptable in the context where there was a plan to injure John by presenting it as an accident before the end of the year, and the plan was successfully carried out. (14c) involves the inference marker *daroo*, which typically signals that the embedded proposition is expected to become true in the future. (14d) expresses that Saki had hoped that it would snow within the year, and it actually did. Finally, (14e) accompanies *tesimau*, which implicates that the action of the verb it is attached to is undesirable for the speaker. The speaker of (14e) had considered it undesirable to have snow within the year, but contrary to his hope, it snowed. All of the above examples are constructed by adding modal markers to the unacceptable sentences (11a) and (11b). This indicates that those modal markers function as licensors of *madeni*.

3.3. The licensing condition for *madeni*

    In the previous subsections, we have witnessed that *madeni* is licensed by either clarification of the number of the event occurrences or certain modality (be they implicit or explicit). Then, a natural question is what these two licensing factors have in common. This subsection tackles this issue.

    I claim that in both types of cases, the truth or felicity of the sentence sufficiently affects the temporal duration provided by *madeni*-phrase rather than affects a particular time point. Let us illustrate this using a toy semantics for *madeni* and the examples in the previous subsections. Building on A&M's framework, I assume that *madeni* has the following denotation:

(15)   a. $[\![\,madeni\,]\!] = \lambda T.\lambda P.\lambda t.\lambda e.\ \tau(s_\mathrm{P}) \leq T \wedge P(e)(t)$, defined only if there is a contextually prominent state s_P such that s_P is a resultant state of e. (when P is eventive)

       b. $[\![\,madeni\,]\!] = \lambda T.\lambda P.\lambda t.\lambda s.\ \tau(e_\mathrm{P}) \leq T \wedge P(s)(t)$, defined only if there is a contextually prominent state e_P such that s is a resultant state of e_P. (when P is stative)

       c. $\tau(s)$ and $\tau(e)$ are the runtime of s and e, respectively.

In prose, when *X-madeni* is combined with a eventive predicate P, it requires that P holds

at an interval t and as a result, a contextually salient state s_P holds prior to X. Note that t comes before $\tau(s_P)$, because the cause precedes the result. When X-*madeni* is combined with a stative predicate P, it requires that P holds at t and a contextually salient event e_P of which P is the result holds prior to X. With this semantics, I analyze (11a) as follows (the definedness conditions of *madeni* are omitted hereafter for the sake of visibility):

(16) a. $[\![\,\text{PAST}\,]\!] = t_{\text{PAST}}$ (the pronominal past tense; see Partee 1973)

   b. $[\![\,\textit{John-wa ziko-ni at}\,]\!] = \lambda t.\lambda e.\ \textbf{have-accident}(e)(t) \wedge \text{AGENT}(e) = \textbf{J}$.

   c. $([\![\,\textit{madeni}\,]\!]([\![\,\textit{nenmatu}\,]\!])([\![\,\textit{John-wa ziko-ni at}\,]\!])) = \lambda t.\lambda e.\ \tau(s_P) \leq \textbf{end.of.year} \wedge \textbf{have-accident}(e)(t) \wedge \text{AGENT}(e) = \textbf{J}$.

   d. $[\![\,(11a)\,]\!] = [\![\,\text{PAST}\,]\!]([\![\,\textit{madeni}\,]\!]([\![\,\textit{nenmatu}\,]\!])([\![\,\textit{John-wa ziko-ni at}\,]\!]))$
       $= \exists e[\tau(s_P) \leq \textbf{end.of.year} \wedge \textbf{have-accident}(e)(t_{\text{PAST}}) \wedge \text{AGENT}(e) = \textbf{J}]$.[7]

The resulting truth-conditions just require that the having-accident event (and its resultant state) hold at some single contextually salient past time t_{PAST} before the end of the year. Therefore, the truth of this sentence affects the state of affair at one particular interval within the temporal duration provided by *madeni*-phrase.

Next, let us turn to the acceptable case (12a), which specifies how many times the having-accident event occurs (predicates with * are pluralized in the sense of Link 1983):

(17) a. $[\![\,\textit{doraibaa-ga hyaku-nin ziko-ni at}\,]\!] = \lambda t.\lambda e.\ \exists x[\textbf{driver}^*(x) \wedge \textbf{have-accident}^*(e)(t) \wedge \text{AGENT}(e) = x \wedge \text{CARDINALITY}(\text{AGENT}(e)) = 100)]$.[8]

   b. $[\![\,(12a)\,]\!] = [\![\,\text{PAST}\,]\!]([\![\,\textit{madeni}\,]\!]([\![\,\textit{nenmatu}\,]\!])([\![\,\textit{doraibaa-ga hyaku-nin ziko-ni at}\,]\!]))$
       $= \exists e[\tau(s_P) \leq \textbf{end.of.year} \wedge \exists x[\textbf{driver}^*(x) \wedge \textbf{have-accident}^*(e)(t_{\text{PAST}}) \wedge \text{AGENT}(e) = x \wedge \text{CARDINALITY}(\text{AGENT}(e)) = 100)]]$.

Briefly, this sentence is true iff there is a plural having-accident event e prior to the end of the year such that the agents of e are drivers and the cardinality of e's agents is 100. The crucial difference between (11a) and (12a) is that, in the latter case, the event happens multiple times before by the end of the year (note that in this case, we have to assume multiple contextually salient past times t_{PAST}). Therefore, (12a) affects multiple intervals within the temporal duration provided by *madeni*-phrase. In this sense, (12a) sufficiently affects that temporal duration.

Occurring multiple times is not the only way to sufficiently affect the temporal duration. Consider (12b), where the snowing event occurs once:

(18) a. $[\![\,\textit{yuki-ga ik-kai hut}\,]\!] = \lambda t.\lambda e.\ \textbf{snow}(e)(t) \wedge \text{CARDINALITY}(e) = 1$.

   b. $[\![\,(12b)\,]\!] = [\![\,\text{PAST}\,]\!]([\![\,\textit{madeni}\,]\!]([\![\,\textit{nenmatu}\,]\!])([\![\,\textit{yuki-ga ik-kai hut}\,]\!]))$
       $= \exists e[\tau(s_P) \leq \textbf{end.of.year} \wedge \textbf{snow}(e)(t_{\text{PAST}}) \wedge \text{CARDINALITY}(e) = 1]$.

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[7] I assume that Existential Closure is applied when there remains an unsaturated slot for events or states in the end of the composition.

[8] This denotation is a simplified version of Nakanishi's (2007) analysis of Japanese floating quantifiers. This simple denotation suffices for the current purpose.

What is crucial is that if another snowing event occurs before the end of the year, the whole sentence becomes false, since in such a case CARDINALITY(e) is no longer 1. Therefore, the truth of (12b) prevents the same predicate from holding at the times other than t_{PAST} up to the end of the year. In this sense, it sufficiently affects other time intervals contained in the duration provided by *madeni*-phrase.

Moving on to the cases where certain modality is involved, I analyze the schedule modality implicitly involved in (13) as a not-at-issue content (Potts 2003 and Gutzmann 2015):[9]

(19)   a. $\Box_{\text{SCHEDULE}} = \lambda P.\lambda t.\lambda e.\ P(e)(t) \bullet \text{SCHEDULED}(t)(\exists t',\ e'[P(e')(t')])$.

      b. $\text{SCHEDULED}(t)(p) = $ It is scheduled at t for p to be true.[10]

      c. $[\![$ *John-wa kigen-madeni kadai-o teusyutusi* $]\!]$
         $= \lambda t.\lambda e.\ \tau(s_{\text{P}}) \leq \textbf{deadline} \wedge \textbf{submit}(e)(t_{\text{PAST}}) \wedge \text{AGENT}(e) = \textbf{J}$.

      d. $[\![\,(13)\,]\!] = [\![\,\text{PAST}\,]\!](\Box_{\text{SCHEDULE}}([\![$ *John-wa kigen-madeni kadai-o teusyutusi* $]\!]))$
         $= \exists e[\tau(s_{\text{P}}) \leq \textbf{deadline} \wedge \textbf{submit}(e)(t_{\text{PAST}}) \wedge \text{AGENT}(e) = \textbf{J}]$
         $\bullet \text{SCHEDULED}(t_{\text{PAST}})(\exists e',\ t'[\tau(s_{\text{P}}) \leq \textbf{deadline} \wedge \textbf{submit}(e')(t') \wedge \text{AGENT}(e) = \textbf{J}])$.

The content that comes to the right of $\bullet$ is not-at-issue. It is independent of the truth-conditions, but has to be satisfied in order for the sentence to be felicitously uttered. Then, this sentence says that John actually submitted an assignment at t_{PAST}, which is before the deadline, and the occurrence of such an event is scheduled at t_{PAST}. Crucially, if the relevant schedule is in effect at the time of submission, that is, at t_{PAST}, the same schedule is necessarily in effect at another time prior to t_{PAST}, as long as that time comes later than the moment at which the schedule is enforced. Therefore, the felicity of this example at t_{PAST} necessarily ensures that the relevant modal claim holds at time intervals other than t_{PAST}. Similarly to the cases of multiple events, it sufficiently affects the state of affairs at other time intervals contained in the duration provided by *madeni*-phrase.

The same reasoning can be applied to other cases of modality. In (14a) and (14b), if John had an accident at a time t, the same obligation/schedule must have been in effect at some time before t. In (14c-14e), the event of snowing is also expected/desired/undesired at some time before the time of snowing.

Thus, I propose the following condition:[11]

(20)   *X-madeni* can be felicitously used only if the truth/felicity of the sentence with *madeni* at t sufficiently affects the temporal duration whose endpoint is *X*, in the sense that;

      a.   the described event occurs multiple times within that duration, or;

      b.   the truth/felicity of the sentence prevents sentences of the same predicate from

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[9] The implicit modality involved in (13) might be more pragmatic, and it might be inappropriate to assume that it is expressed in the not-at-issue level, which is a rather semantic component of the sentence. What is crucial here is that, whether semantically or pragmatically, the schedule modality is present at t_{PAST}.

[10] While this notation can be more elaborated using possible worlds (see Kratzer 1981), but I adopt this simple notation for visibility.

[11] I acknowledge that this condition lacks formality. How to formalize it is clearly one of the remaining issues for future research.

being true at times other than *t* up to *X*, or;

    c.   the truth/felicity of the sentence necessarily ensures that the same truth/felicity-conditions are satisfied at times other than *t* up to *X*.

I leave it intact whether this requirement is lexically hardwired into *madeni*'s lexical semantics or can be derived from other semantic/pragmatic norms available in Japanese.

Before closing this section, let us confirm that the English *by* does not impose the condition (20). Consider the following, naturally occurring example:

(21)   It took a few hours to retrieve our guys from the valley, and by that time it had begun to rain.   (= A&M's (21))

In this example, beginning-to-rain event neither prevents the same event from occurring at other intervals, nor ensures that other beginning-to-rain events occur at other intervals. Nevertheless, *by* is felicitous here. As might be expected, a literal translation of (21) using *madeni* yields an unacceptable sentence:

(22) #Nakama-o   tani-kara   kyuusyutusuru-no-ni suu-zikan   kakat-te
       friend-ACC valley-from   rescue-NMLZ-in   several-hour take-PAST
         sono-toki-madeni ame-ga   huri-hajime-tei-ta.
         that-time-by   rain-NOM fall-began-PERF-PAST
       'It took several hours to rescue the friends, and by that time it had begun to rain.'

The difference in acceptability between (21) and (22) suggests that the condition (20) is not imposed on *by*. Below, I propose that this is the cause of the contrast between (3) and (4).

4. *Ima-madeni*

This section demonstrates what predicate is compatible with the combination of *madeni* and *ima* 'now', and confirms that the condition (20), which I have proposed for *madeni*, is also operative on *ima-madeni*. The infelicity of (4) is also attributed to the failure to satisfy (20) However, contrary to the cases of *X-madeni* (where $X \neq ima$), *ima-madeni* remains infelicitous even when a modality of the type discussed in Section 3.2. is involved in the sentence.

4.1. *Ima-madeni*'s sensitivity to the temporal duration

Let us begin with (23a), whose denotation is presented in (23b):

(23)   a.??John-wa ima-madeni ziko-ni   at-ta.
           John-TOP now-by   accident-with encounter-PAST
           'John had an accident by now.'

      b. $[\![(23a)]\!] = [\![\text{PAST}]\!]([\![madeni]\!]([\![ima]\!])([\![John\text{-}wa\ ziko\text{-}ni\ at]\!]))$
          $= \exists e[\tau(s_{\text{P}}) \leq \textbf{now} \wedge \textbf{have-accident}(e)(t_{\text{PAST}}) \wedge \text{AGENT}(e) = \textbf{J}].$

(23a) is true if the resultant state of John having an accident holds prior to **now**. This clearly satisfies neither (20a), (20b) nor (20c).

As expected, the sentence improves if it makes it explicit how many times the relevant event happened:

(24) a. Doraibaa-ga   hyaku-nin   ima-madeni ziko-ni   at-ta.
          drivers-NOM   hundred-people now-by   accident-with encounter-PAST
          'A hundred drivers had an accident by now.'

    b. $\llbracket (24a) \rrbracket = \exists e[\tau(s_P) \leq \textbf{now} \wedge \exists x[\textbf{driver*}(x) \wedge \textbf{have-accident*}(e)(t_{PAST}) \wedge \text{AGENT}(e)$
        $= x \wedge \text{CARDINALITY}(\text{AGENT}(e)) = 100)]].$

This sentence fulfills (20a). the having-accident event occurs multiple times up to **now**.

There is an expression that is frequently used with *ima-madeni* is *ta-koto-ga-aru*.[12]It conveys that the subject has experienced the event/state denoted by the verb in its complement:

(25) Saki-wa   ima-madeni kekkonsi-ta-koto-ga-aru.
      Saki-TOP   now-by   marry-PAST-thing-NOM-exist.PRES
      'Saki has got married by now.'

I assume that *ta-koto-ga-aru* has the denotation in (26a). Then, the meaning of (25) is derived as in (26b-c)

(26) a. $\llbracket ta\text{-}koto\text{-}ga\text{-}aru \rrbracket = \lambda P.\lambda t.\lambda e.\ \exists t'[t' \leq t \wedge P(e)(t')].$

    b. $\llbracket Saki\text{-}wa\ kekkonsi\text{-}ta\text{-}koto\text{-}ga\text{-}aru \rrbracket$
        $= \lambda t.\lambda e.\ \exists t'[t' \leq t \wedge \textbf{marry}(e)(t') \wedge \text{AGENT}(e) = \textbf{S}].$

    c. $\llbracket \text{PRES} \rrbracket = t_{PRES}$ (the contextually salient present time)
        $\llbracket (25) \rrbracket = \llbracket \text{PRES} \rrbracket(\llbracket madeni \rrbracket(\llbracket ima \rrbracket)(\llbracket Saki\text{-}wa\ kekkonsi\text{-}ta\text{-}koto\text{-}ga\text{-}aru \rrbracket))$
        $= \exists e[\tau(s_P) \leq \textbf{now} \wedge \exists t'[t' \leq t_{PRES} \wedge \textbf{marry}(e)(t') \wedge \text{AGENT}(e) = \textbf{S}]].$

The resulting denotation says that the resultant state of which Saki's marriage is the cause is located prior to **now**, the time denoted by *ima*, and there is some time t' such that Saki got married at t' and t' precedes the contextually salient time t_{PAST}. These truth-conditions satisfy (20c). The truth of (25) at t_{PRES} means that Saki's marriage time t' precedes t_{PRES}. Then, for any time t^* such that $t' \leq t^* \leq t_{PRES}$, the same predicate (that is, $\lambda t.\ \exists t'[t' \leq t \wedge \textbf{marry}(e)(t')$ $\wedge \text{AGENT}(e) = \textbf{S}])$ necessarily holds. Thus, the compatibility between *ima-madeni* and *ta-koto-ga-aru* is captured by the semantics in (26a) and (20c).

Note that the semantics of *ta-koto-ga-aru* I propose in (26a) is not ad hoc; it captures the interpretive behavior of *ta-koto-ga-aru* regarding negation. Consider the following.

(27) a. Saki-wa   kekkonsi-ta   koto-ga-nai.
          Saki-TOP   marry-PAST   thing-NOM-NEG
          'Saki has never got married.'

    b. Saki-wa   kekkonsi-nakat-ta.
          Saki-TOP   marry-NEG-PAST
          'Saki did not get married'

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[12] Morphologically speaking, *ta-koto-ga-aru* is a combination of the past tense *ta*, the formal noun *koto* 'thing', the nominative case *ga*, and the verb *aru* 'exist'. I do not commit to the issue why the combination of these four elements yields experiential meaning.

(27a) and (27b) contain the negated form of *koto-ga-aru* and the negated form of simple past without *koto-ga-aru*, respectively. (27b) means that Saki did not get married at some past time, so it allows either the context where Saki got married at some other time or the context where Saki has been single for her life. On the other hand, (27a) only allows the latter situation. The following are the denotations of (27a) and (27b):

(28) a. $[\![(27a)]\!] = [\![\text{NEG}]\!]([\![\text{PRES}]\!]([\![\textit{Saki-wa kekkonsi-ta-koto-ga-aru}]\!]))$
$= \neg \exists e[\exists t'[t' \leq t_{\text{PRES}} \wedge \mathbf{marry}(e)(t') \wedge \text{AGENT}(e) = \mathbf{S}]].$

  b. $[\![(27b)]\!] = [\![\text{NEG}]\!]([\![\text{PAST}]\!]([\![\textit{Saki-wa kekkonsi}]\!]))$
$= \neg \exists e[\mathbf{marry}(e)(t_{\text{PAST}}) \wedge \text{AGENT}(e) = \mathbf{S}].$

In (28a), there is no marrying event that happens before t_{PRES} and whose agent is Saki, which means that Saki has never got married. On the other hand, (28b) says that there is no marrying event whose agent is Saki at the contextually prominent interval t_{PAST}. Thus, the semantics that I propose to capture *ima-madeni*'s compatibility with *ta-koto-ga-aru* also captures the contrast between (27a) and (27b).

Now we can account for why (4), repeated here as (29), is unacceptable:

(29) #Saki-wa   ima-madeni ie-ni   iru.
Saki-TOP now-by   home-at be

'Saki is home by now'

The predicate *ie-ni iru* 'be home' is stative. Therefore, (15b) is applied instead of (15a):

(30) a. $[\![\textit{Saki-wa ie-ni iru}]\!] = \lambda t.\lambda s.\ \mathbf{be.home}(s)(t) \wedge \text{HOLDER}(s) = \mathbf{S}.$

  b. $[\![(29)]\!] = [\![\text{PRES}]\!]([\![\textit{madeni}]\!]([\![\textit{ima}]\!])([\![\textit{Saki-wa ie-ni iru}]\!]))$
$= \exists s[\tau(e_{\text{P}}) \leq \mathbf{now} \wedge \mathbf{be.home}(s)(t_{\text{PRES}}) \wedge \text{HOLDER}(s) = \mathbf{S}].$

In prose, there is being-home state s such that the holder of s is Saki, s is the result of the contextually salient event e_{P} and s holds at the present time. This truth-conditions do not ensure multiple occurrences of the event, prevent the same event from occurring at other intervals, nor necessarily ensure that the predicate involved holds at interval other than t_{PRES}. Therefore, this sentence cannot satisfy the licensing condition for *madeni*.

Then, it is predicted that clarification of the number of event occurrences resolves the incompatibility between *ima-madeni* and the present form of stative predicates. This prediction is borne out:[13]

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[13] (29) does not improve by simple addition of an expression that refers to how many times the relevant event occurs:

(i) #Saki-wa   ima-madeni go-kai   ie-ni   iru.
Saki-TOP now-by   five-time home-at be

'Saki is home five times by now'

It is unclear why (i) is far more unnatural compared to (31). A possible factor is that while (31) describes Japan's history, which necessarily invokes a contextually relevant temporal duration, *ie-ni iru* 'be home' in (i) appears to describe only the current state.

(31) Nihon-ni-wa nooberu-shoo zyusyoosha-ga ima-madeni nizyuu-nin
Japan-at-TOP Nobel-prize laureate-NOM by-now twenty-people

izyoo   iru.
no.fewer.than be

'In Japan, there are at least 20 Nobel prize winners by now.'

This sentence is analyzed as follows:

(32) a. ⟦ *nihon-ni-wa nooberushoo-zyusyoosha-ga nizyuu-nin izyoo iru* ⟧
= $\lambda t.\lambda s.\ \exists x[$**Nobel.prize.winner**$^*(x) \wedge$ **exist**$^*(s)(t) \wedge$ HOLDER$(s) = x \wedge$
LOCATION$(s) =$ **Japan** $\wedge$ CARDINALITY(HOLDER$(e)) \geq 20]$.

b. ⟦ (31) ⟧ = ⟦ PRES ⟧(⟦ *madeni* ⟧(⟦ *ima* ⟧)(⟦ (32a) ⟧))
= $\exists s[\tau(e_P) \leq$ **now** $\wedge\ \exists x[$**Nobel.prize.winner**$^*(x) \wedge$ **exist**$^*(s)(t_{PRES}) \wedge$ HOLDER(s)
$= x \wedge$ LOCATION$(s) =$ **Japan** $\wedge$ CARDINALITY(HOLDER$(e)) \geq 20]]$.

The existence of a Nobel prize winner invokes a contextually salient event of someone winning the Nobel prize, and (31) conveys that cardinality of the holders of such existence is at least 20. This means that winning-Nobel-prize events occurs at least 20 times. This clearly satisfies (20a). Note that the sentence degrades if there is no explicit reference to the number of event occurrences, as predicted:

(33) ??Nihon-ni-wa nooberu-shoo zyushoosha-ga ima-madeni iru.
Japan-at-TOP Nobel-prize laureate-NOM by-now be

'In Japan, there is a Nobel prize winner by now.'

Thus, I conclude that *ima-madeni*, as well as other instances of *madeni*, requires that the sentence containing it sufficiently affects the temporal duration it provides, and this requirement is a factor that differentiates *ima-madeni* from *by now* in English.

4.2. Modalities cannot license *ima-madeni*

In Section 3.2., we have witnessed that *madeni* is felicitous when the whole sentence implicitly expresses such a modality as schedule, or when it accompanies certain modality markers. However, these strategies are not effective concerning *ima-madeni*:

(34) a.??John-wa ima-madeni kadai-o   teisyutusi-ta.
John-TOP ima-by   assignment-ACC submit-PAST

'John has submitted an assignment by now.'

b.??John-wa ima-madeni ziko-ni   awa-nakerebanaranakat-ta.
John-TOP now-by   accident-with encounter-must-PAST

'John should have had an accident by now.'

c.??Yotei-doori   John-wa ima-madeni ziko-ni   at-ta.
plan-according.to John-TOP now-by   accident-with encounter-PAST

'As planned, John had an accident by now.'

   d.?? Yuki-ga   ima-madeni hut-ta   daroo.
      snow-NOM now-by   fall-PAST will
      'It must have snowed by now.'

   e.?? Saki-no   nozomi-doori   yuki-ga   ima-madeni hut-ta.
      Saki-GEN wish-according.to snow-NOM now-by   fall-PAST
      'As Saki hoped, It snowed by now.'

   f.?? Yuki-ga   ima-madeni hut-tesimat-ta.
      snow-NOM now-by   fall-TESIMAU-PAST
      'Unfortunately, it snowed by now.'

I speculate that unacceptability of these cases is derived from the flexibility of the referent of *ima* 'now'. Take (34a) as an illustrative example. The addressee of (34a) infers that a schedule to submit an assignment was implemented and its deadline is *ima* 'now'. However, the referent of *ima* varies depending on when it is uttered; there can be even a case where the addressee cannot identify what time *ima* refers. It is inconceivable for the addressee to suppose the existence of a schedule whose endpoint is such a flexible time.

    This speculation is consistent with the felicity of the following example:

(35) John-wa kyoo-madeni kadai-o   teisyutu-sita.
      John-TOP today-by   assignment-ACC submit-PAST
      'John has submitted an assignment by now.'

Unlike *ima* 'now', the referent of *kyoo* 'today' is relatively rigid and can easily be shared between the speaker and the addressee. Even if (35) is an utterance in the past, the addressee is able to know what time *kyoo* refers by looking up the date on which the utterance was made. Therefore, *kyoo* is qualified as a deadline of an assignment, leading to the acceptability of (35).[14]

    To conclude, the licensing condition for *madeni*, which requires the sentence sufficiently affects the temporal duration provided by the *madeni* phrase, is also applicable to *ima-madeni*. It is compatible with the clarification of the number of event occurrences and *koto-ga-aru*. The incompatibility of *ima-madeni* with predicates describing the current state can also be attributed to a violation of the licensing condition. However, expressing certain modalities, which licenses *madeni*, does not license *ima-madeni* due to the flexibility of *ima*'s referent.

5. Conclusion

    This paper has focused on why the English *by now* can co-occur with predicates denoting current states, while *ima-madeni* cannot. I have demonstrated that there seems no differ-

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[14] This point is further corroborated by the following contrast:

(ii) [#ima / kyoo]-ga   simekiri-no   kadai
     [now / today]-NOM deadline-GEN assignment
     'an assignment due [#now/today]'

ence between the two in terms of their aspectual restriction on the co-occurring verb. Then, we have observed that clarification of the number of event occurrences and certain modalities license *madeni*, and I have argued that *X-madeni* can be felicitously used only if the truth/felicity of the sentence with *madeni* at *t* sufficiently affects the temporal duration whose endpoint is *X*. This condition is also applicable to *ima-madeni*, so what differentiates *by now* and *ima-madeni* can be reducible to the absence/presence of this condition. Finally, it has been shown that *ima-madeni* is incompatible with modalities that license *madeni* when its complement is not *ima*. The possible reason I mentioned is that the referent of *ima* 'now' is so flexible as to be the endpoint of modality.

One major remaining issue is that the requirement of *madeni* seems to be alleviated when it is used in interrogatives:

(36)　John-wa　nenmatu-madeni ziko-ni　　at-ta-no?
　　　John-TOP　end.of.year-by　　accident-to encounter-PAST-Q
　　　'Did John have an accident by the end of year?'

This sentence sounds more natural compared to its affirmative version (11a). However, the interrogative version of (4) is no more acceptable than (4):

(37) #Saki-wa　ima-madeni ie-ni　　iru-no?.
　　　Saki-TOP　now-by　　home-at　be-Q
　　　'Is Saki home by now?'

The interaction between (*ima-*)*madeni* and the sentence form is to be explored in future research.

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