Problem solving with Japanese *beki*[1]

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Abstract. Expressions of prioritizing modality vary within and across languages in the criteria they can encode (rules, goals, or desires) and the directive or expressive speech acts they can perform. Crucial parameters include source of evaluation, endorsement, modal strength, and counterfactuality implicatures. Japanese *beki* is a prioritizing modal which, unlike the better studied Indo-European modals, lacks epistemic readings and interacts with tense transparently, allowing us to isolate modal and temporal effects of past marking.

Keywords: prioritizing modality, counterfactuality, decision problem

1. Introduction

Expressions of prioritizing modality vary within and across languages in the criteria they can encode (rules, goals, or desires) and the directive or expressive speech acts they can perform. Crucial parameters include source of evaluation, endorsement, modal strength, and counterfactuality implicatures (von Fintel and Iatridou 2008; Rubinstein 2012; Silk 2022). Japanese *beki* is a prioritizing modal which, unlike the better studied Indo-European modals (von Fintel and Iatridou 2008; Portner 2009; Rubinstein 2012; Silk 2022: i.a.), lacks epistemic readings and interacts with tense transparently, allowing us to isolate modal and temporal effects of past marking. In this paper we are especially interested in the observation that *beki*-sentences with Past tense generally (with few exceptions, discussed below) have counterfactual interpretations, stating that something should have happened but did not. We explain this behavior in terms of a complex interplay between the modal at-issue meaning of *beki* and certain presuppositions that are triggered by *beki*.

In Section 2 we lay out the basic facts about *beki* and its interaction with tense. We present our analysis of *beki* as a practical modal with special at-issue and non-at-issue profiles in Section 3. Section 4 discusses how our analysis predicts the strong tendency for Past-tense *beki*-sentences to receive counterfactual readings, as well as the limited range of cases in which this counterfactual inference is avoided. Section 5 concludes.

2. Data

2.1. Basic properties

Japanese *beki* is a so-called 'formal noun' (*keisiki meisi* – Yamada 1908; Matsushita 1928; a.o.). It takes a Non-Past-tensed clause as its complement to form a combination which behaves

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outwardly like a noun phrase. In its most typical use, *p-beki* is followed by a tensed form of the copula *da* to form a clause:

(1) *John-wa asita zyugyoo-ni ik-u* ***beki da***.
John-TOP tomorrow class-DAT go-NPST BEKI COP.NPST
'John should go to class tomorrow (in **my** opinion).'

In the descriptive literature, *beki* has been treated as a modal expression concerned with decision-making or moral/value judgment (Moriyama 1997; Takanashi 2010; a.o.). Building on this basic intuition, we assume furthermore that the semantics of *beki* involves **subjective evaluation**: the core meaning of *p-beki* is that the course of events or state of affairs described by *p* is optimal or appropriate by the moral standards or preferences of some perspective holder, which is by default identified with the speaker. Criteria of this kind are typically associated with weak necessity modals, which state about a course of events that it is optimal but not strictly necessary (von Fintel and Iatridou 2008; Sæbø 2009; Rubinstein 2012, 2021; a.o.).

The subjective nature of *beki* can be demonstrated by a number of diagnostics. For instance, as (2) shows, the speaker of *beki* must be able to give grounds for their evaluation (cf. Willer and Kennedy 2020 for a similar requirement imposed by expressions of morality in English): a follow-up that indicates a lack of this ability leads to infelicity. This contrasts with the behavior of *-nakereba naranai*, another prioritizing necessity modal which roughly corresponds to English '*have to*', as shown in (3) (see Kaufmann and Tamura 2020 for a survey of modal expressions in Japanese written in English).

(2) a. *Boku-to kekkonsu-ru nara, kimi-ga myoozi-o kaer-u* ***beki da***.
I-with marry-NPST if you-NOM name-ACC change-NPST BEKI COP.NPST
'If you marry me, you should change your last name.'
b. ??... *naze sore-ga hituyoo ka-wa wakar-ana-i ga.*
why that-NOM necessary Q-TOP know-NEG-NPST though
'... though I have no idea why that's needed.'

(3) a. *Boku-to kekkonsu-ru nara, kimi-ga myoozi-o kae-****nakereba narana-i***.
I-with marry-NPST if you-NOM name-ACC change-must-NPST
'If you marry me, you have to change your last name.'
b. ... *naze sore-ga hituyoo ka-wa wakar-ana-i ga.*
why that-NOM necessary Q-TOP know-NEG-NPST though
'... though I have no idea why that's needed.'

As with weak necessity modals in other languages, *beki* cannot be used to describe the content of laws, as shown in (4) from Takanashi (2010: p.95) (see von Fintel and Iatridou 2008 for corresponding observations about English *should*). Unlike *-nakereba naranai*, the use of *beki* implies that the speaker assumes that getting a license is not required by law but thinks it is desirable at least from his point of view.

(4) *Kuruma-o untensu-ru-ni-wa, menkyo-o* {*#tor-u* ***beki da*** */*
car-ACC drive-NPST-DAT-TOP license-ACC get-NPST BEKI COP.NPST
*tor-****anakereba narana-i***}.
get-must-NPST
'In order to drive a car, you {#should / must} get a license.'

Beki also contrasts with imperatives in a way that further highlights its core meaning described above. Imperatives do not necessarily commit the speaker to a personal preference about whether *p* comes about, as they can be used to give speaker-disinterested advice (5B) or express concessions (6b) (Kaufmann 2012). *Beki*, however, cannot be used for either purpose. (5B') sounds as if the speaker is giving her own view (based on her own personal standards) on what is the best way to get to the station, which is not what the hearer asked for. The *beki*-statement thus feels irrelevant and uncooperative in this exchange. (6b) sounds as if the speaker actually prefers the hearer going to the party, while the signal of concession *moo ii* (lit. 'already enough') and the derogatory expressive *kuso* (lit. 'shit') suggest otherwise.

(5) A: *Sono eki-e-wa doo yat-tara ik-e-mas-u ka?*
that station-to-TOP how do-COND go-be.able-POL-NPST Q
'How can I get to that station?'
B: *Aa, hachiban-no basu-ni not-**te** **kudasai**.*
well number.eight-GEN bus-DAT take-GRND please
'Well, please take the No.8 bus.'
B': ?*Aa, hachiban-no basu-ni nor-u **beki des-u** ne.*
well number.eight-GEN bus-DAT take-NPST BEKI COP.POL-NPST SFP
'Well, you should take the No.8 bus.'

(6) a. *Moo ii, sono kuso mitaina paatii-ni it-te-**koi** yo!*
already good that shit like party-DAT go-GRND-come.IMP SFP
'Alright then, go to that damn party!'
b. #*Moo ii, sono kuso mitaina paatii-ni it-te-kur-u **beki** **da** yo!*
already good that shit like party-DAT go-GRND-come-NPST BEKI COP.NPST SFP
lit. 'Alright then, you should go to that damn party.'

Note finally that, in line with what has been observed for other perspective sensitive elements, who counts as the source of the assessment underlying a use of *beki* can shift in specific grammatical environments.[2] In an information-seeking question like (7), the source of evaluation shifts from speaker to addressee, a phenomenon known as 'interrogative flip' (Faller 2002).

(7) *John-wa asita zyugyoo-ni ik-u **beki des-u** ka?*
John-TOP tomorrow class-DAT go-NPST BEKI COP.POL-NPST Q
'Should John go to class tomorrow (in **your** opinion)?'

The perspective can be shifted to the attitude holder of an attitude predicate, as in (8). A shift to a third person can also be effected by hearsay evidentials, in which case the source may optionally be made explicit by *-ni yoreba* ('according to'), see (9).

(8) *Mary-wa [John-ga asita zyugyoo-ni ik-u **beki da** to] omotteiru.*
Mary-TOP John-NOM tomorrow class-DAT go-NPST BEKI COP.NPST C think
'Mary thinks that John should go to class tomorrow (in **her** opinion).'

[2]Other phenomena instantiating this pattern are discussed in Speas and Tenny (2003), Zu (2018), and Stegovec (2019), a.o.

(9) *(Gakkatyo-ni yoreba,) kyooin-ga sore-o su-ru **beki da** sooda.*
dean-DAT according professor-NOM it do-NPST BEKI COP.NPST HEARSAY
'A professor should do it (according to **the dean's** opinion).'

2.2. Interaction with past

While the prejacent of *beki* has to have Non-Past tense, the copula *da* that follows *beki* can combine with the Past morpheme *-ta*. Sentences of the form '*p-beki dat-ta*' typically give rise to a counterfactuality inference: they do not merely state that *p* was necessary in the past, but also imply that *p* did not happen. Past-tensed *beki* is typically used to express regret about, or criticize, a wrong choice made out of ignorance, inertia or ill-will. As was observed in Takanashi (2010: pp.159-160), (10) cannot be continued with a follow-up that implies the truth of *p* with the same ease with which (11) ('*-nakereba narana-katta*') can be continued with the same follow-up.[3]

(10) *Kinoo-wa haisya-ni ik-u **beki dat-ta**. ...*
yesterday-TOP dentist-DAT go-NPST BEKI COP-PAST
'Yesterday I should have gone to the dentist. . . .'
a. ??. . . *Sorede, zikan-o tukut-te, it-ta.*
so time-ACC make-GRND go-PAST
'. . . So, I made time and went.'
b. . . . *Sikasi, zikan-ga naku-te ik-e-na-katta.*
but time-NOM be.not-GRND go-able-NEG-PAST
'. . . But I couldn't because I didn't have time.'

(11) *Kinoo-wa haisya-ni ik-**anakereba narana-katta**. . . .*
yesterday-TOP dentist-DAT go-must-PAST
lit. 'Yesterday I had to go to the dentist. . . .'
a. . . . *Sorede, zikan-o tukut-te, it-ta.*
so time-ACC make-GRND go-PAST
b. . . . *Sikasi, zikan-ga naku-te ik-e-na-katta.*
but time-NOM be.not-GRND go-able-NEG-PAST

To underscore these points, we observe that Past-tensed *p-beki dat-ta* cannot be used when the speaker is uncertain whether the prejacent *p* took place, as shown in (12): the sentence implies wrongly that John did not go to the class and the speaker knows it.

(12) **Context (Uncertainty)**: John hesitated whether to attend the class yesterday. Today I heard from another student in that class that the professor held a helpful review session for the exam. I don't know if John went in the end. I happen to see John and say:
??*Kimi-wa kinoo-no zyugyoo-ni ik-u **beki dat-ta** (kedo,*
you-TOP yesterday-GEN class-DAT go-NPST BEKI COP-PAST but
zyugyoo-ni-wa it-ta?).
class-DAT-TOP go-PAST
'You should have gone to the class yesterday. (Did you go to class?)'

[3]Note that, unlike English '*had to*', Past-tensed '*-nakrereba narana-katta*' does not give rise to the actuality inference (i.e., the inference that *p* happened), as suggested by its compatibility with the follow-up in (b).

As we noted, '*p-beki dat-ta*' is typically used to imply that a wrong decision was made: in such cases the counterfactuality of *p* results as the failure to made the right decision. However, one can also imagine cases in which the right decision was made but failed to be carried out because of external obstacles. In such cases '*p-beki dat-ta*' cannot be used, as (13) shows. Thus even if the prejacent is false, '*p-beki dat-ta*' is infelicitous as long as the agent made the right decision.

(13) **Context (Prevention)**: John hesitated whether to attend the class yesterday. In the end, he decided to attend, but got stuck in the elevator until after the class. His decision itself was the right one, as the professor held a helpful review session for the exam in the class. I know all this. I happen to see John and say:

#Kimi-wa kinoo-no zyugyoo-ni ik-u ***beki dat-ta*** *yo.*
you-TOP yesterday-GEN class-DAT go-NPST BEKI COP-PAST SFP
'You should have gone to the class yesterday.'

In addition to the basic properties described in Section 2.1, a successful analysis of *beki* also has to explain its intricate interaction with Past tense. In the next section, we will outline such an analysis. In Section 4, we will discuss how our analysis explains the data presented in this section, with special focus on when and why the counterfactuality inference does or does not arise.

3. Analyzing *beki* as a practical modal

We assume a standard model with a set of possible worlds W and times T (for simplicity, the latter are temporal instants). Contexts c are Kaplanian (1989) quadruples $\langle SP, AD, w, t\rangle$, where SP_c is the speaker, AD_c the addressee, w_c and t_c the utterance world and time, respectively. Interpretation proceeds with respect to a context and an index of evaluation, where the index is a triple $\langle w, t, \pi\rangle$ consisting of a world w, a time t, and a perspective center π (Lasersohn 2005; Stephenson 2007). In the unembedded case, the world and time component of the index of evaluation are identified with w_c and t_c, respectively. Intensional operators quantifying over worlds and/or times shift the world and time of the index as usual. By default, π is identified with SP_c in matrix declaratives but it shifts to AD_c in matrix interrogatives, to the referent of the matrix subject in attitude reports, and to the information source under hearsay evidentials.

We propose that *beki* denotes a Kratzer-style necessity modal (Kratzer, 1981, 1991, 2012), whose modal base represents relevant facts and whose ordering source encodes π's moral principles or subjective preferences. We propose (14) as its at-issue meaning:

(14) '*p beki*' is true at c and $\langle w, t, \pi\rangle$ iff for all w' that are (i) compatible with the relevant facts at $\langle w, t\rangle$ and (ii) optimal according to π's moral principles or subjective preferences at $\langle w, t\rangle$, there is a t' such that $t < t'$ and p is true at $\langle w', t', \pi\rangle$.

This definition captures the observations from Section 2.1. The modal flavor (moral principles or subjective preferences) ensures that *beki* cannot describe the contents of laws or convey instructions, concessions, or the like. The dependence on the perspectival center π explains the default anchoring to the speaker and the shifts depending on linguistic context. Finally, given standard assumptions about introspection regarding one's moral principles or preferences, speakers (more generally, the perspectival center) have to be able to give grounds for the evaluations expressed with *beki*.

We propose furthermore that *beki* has the non-at-issue content in (15):

(15) At a context c and an index $\langle w,t,\pi\rangle$, p *beki* presupposes that
  a. there is a salient **decision problem** Δ such that p answers Δ; and
  b. Δ is **not nailed** in c; and
  c. p is **not settled** at $\langle w,t\rangle$.

The presuppositions are intended to capture the inherently practical character of *beki*; the crucial concepts are understood as follows. A **decision problem** Δ induces a partition on a salient set of indices. The cells of this partition represent possible courses of events choosable for the relevant agent (see Cariani et al. 2013). Thus the formal representation of decision problems is similar to that of questions (e.g., Groenendijk and Stokhof 1984), as shown in Figure 1.

$\Delta \approx$ 'Does John go to the class?'

Yes
No

$\Delta \approx$ 'Where does John go?'

Class	Cafe
Party	Home

Figure 1: Illustration of decision problems

A decision problem Δ is **nailed** at world w and time t iff Δ has been decided correctly at w and t according to the relevant criteria. Thus there are several possible reasons for which Δ may **not** be **nailed** at $\langle w,t\rangle$: (i) no decision has been made; (ii) a decision has been made, but it was a wrong decision by the criteria underlying the interpretation of *beki*; (iii) the speaker does not know what the relevant criteria amount to. Notice that, since we assume that the speaker has introspective access to their own criteria, (iii) will typically arise only when the perspectival center is shifted away from the speaker.

A proposition p is **settled** at $\langle w,t\rangle$ iff its truth value is constant across all ***historical alternatives*** of w at t. The set of historical alternatives of w at t consists of worlds that share the same history with w at least up until t.[4] A proposition p is **not settled** at w and t iff its truth value is not constant across the historical alternatives of w at t. Historical alternatives may disagree about the truth value of propositions about the future. Propositions about future actions are generally neither settled true nor settled false, but propositions about past actions always are either. We assume that *beki* is interpreted with respect to a ***metaphysical modal base***, that is, the domain of quantification at w and t is given by the set of historical alternatives of w at t (compare 'compatible with the relevant facts' in (14)).

Note that in the non-at-issue meaning component of *beki*, the requirement that the prejacent is not nailed is anchored to the utterance context, whereas the requirement that the prejacent is not

[4]This notion of "settledness" deviates from the one typically found in the literature, according to which p is settled at $\langle w,t\rangle$ iff p is true at all historical alternatives of w at t (Thomason 1984; Condoravdi 2002). The present notion, according to which the truth value of p must be constant (but may be false) across w's historical alternatives at t, was called "presumed settled" in Kaufmann (2002) and "presumed decided" in Kaufmann (2005). We avoid those latter terms here because of a danger of confusion with notions related to the decision problem.

settled is anchored to the index of evaluation. Consequently, we expect intensional operators to affect where (or when) settledness is evaluated, but not where (or when) nailedness is evaluated.

Our proposal analyzes (1), repeated in (16), as follows. As (16) is a matrix sentence with Non-Past on the copula, we assume that it constitutes a case in which the index of evaluation $\langle w,t\rangle$ is identical to $\langle w_c,t_c\rangle$. The sentence presupposes that there is a salient decision problem Δ that partitions the modal base into two cells, containig worlds at which John goes to class (in the future) and worlds at which he does not, respectively. Given that John has yet to make this choice and thus neither option is excluded at t_c, non-nailedness and non-settledness are satisfied automatically. With all these presuppositions met, the speaker asserts that for all indices that are compatible with the relevant facts and optimal according to her subjective criteria, there is a future index that is *tomorrow* (from the perspective of t_c) and at which John goes to class.

(16) *John-wa asita zyugyoo-ni ik-u* ***beki da.***
John-TOP tomorrow class-DAT go-NPST BEKI COP.NPST
'John should go to class tomorrow (in **my** opinion).'

4. Enter Past

4.1. Interaction with Past explained

Past shifts the temporal coordinate of the index of evaluation $\langle w,t\rangle$ to an earlier time t'. The at-issue and non-at-issue meanings of '*p beki dat-ta*' are then as follows.

(17) '*p beki dat-ta*' is true at c iff for some $t' < t_c$, all w' that are (i) compatible with the relevant facts at $\langle w_c,t'\rangle$ and (ii) optimal according to π's moral principles or subjective preferences at $\langle w_c,t_c\rangle$, there is a t'' such that $t' < t''$ and p is true at $\langle w',t'',\pi\rangle$.[5]

(18) At a context c and an index $\langle w,t',\pi\rangle$, '*p beki dat-ta*' presupposes that
a. there is a salient decision problem Δ such that p answers Δ;
b. Δ is not nailed at $\langle w_c,t_c\rangle$; and
c. p is not settled at $\langle w,t'\rangle$.

Notice that the at-issue meaning in (17) is evaluated with respect to the relevant facts at the past time t', as is the non-settledness presupposition in (18c). In particular, even if p is settled at the utterance time, it can be unsettled at the earlier t' (by definition, the set of historical alternatives monotonically shrinks towards the future, Thomason 1984). Intuitively, Past-tensed *beki*-sentences involve a 're-deliberation' of the decision problem Δ relative to a past time at which p was not yet settled: they are true iff p was the right action relative to Δ at the past state of affairs according to π's subjective criteria.

These definitions gloss over two important issues in the interest of readability. We briefly state here what those issues are and how our formal analysis could be augmented to deal with them.

[5]We assume an interpretation of Past tense under which $t' < t_c$ is existentially quantified over. Alternatively, we could assume a referential analysis under which Past introduces a free temporal variable (e.g., Heim 1994). This difference is not important for our immediate concerns in this paper.

First, our analysis sets aside ***hindsight effects***, where events in the future of the past decision point affect what counts as the optimal decision. Arregui (2010) observes hindsight effects for *should have* and considers them reason to abandon an analysis in terms of temporal backshift. Hindsight effects surface also in the interpretation of counterfactual conditionals. For these, Kaufmann (2005) proposes an analysis in terms of causal independencies which reconciles a backshift analysis with the possibility that events in the future of the past branching point are relevant for the truth of the counterfactual sentence (see also Kaufmann 2013). We assume that our analysis of *beki* can be enriched along these lines to deal with hindsight effects.

Second, and related to the point about hindsight effects, while (17) states that criteria relevant for the evaluation are the perspectival center's preferences at the index of the utterance context $\langle w_c, t_c \rangle$, we refrain from saying exactly *why* it is this context, and not the past $\langle w_c, t' \rangle$, that anchors the preferences. Notice first that it seems descriptively correct that the preferences at utterance time are at work in many cases (we discuss more linguistic examples below). Suppose the speaker liked Californian wines until recently and used to order them in restaurants. But her taste has changed; now she prefers French wines. She can then felicitously say '*I should have ordered French wine (at that fancy restaurant last fall)*'. Clearly this is only true relative to her new preferences, not the ones at the time of the order.[6]

Now recall that Past-tensed *beki*-sentences typically imply that the prejacent p did not happen, as shown in (19) (repeated from (10)).

(19) *Kinoo-wa haisya-ni ik-u* ***beki dat-ta.*** ...
yesterday-TOP dentist-DAT go-NPST BEKI COP-PAST
'Yesterday I should have gone to the dentist. ...'
a. ??... *Sorede, zikan-o tukut-te, it-ta.*
so time-ACC make-GRND go-PAST
'...So, I made time and went.'
b. ... *Sikasi, zikan-ga naku-te ik-e-na-katta.*
but time-NOM be.not-GRND go-able-NEG-PAST
'...But I couldn't because I didn't have time.'

The counterfactuality of (19) is derived under our analysis as follows. The speaker re-deliberates the salient decision problem Δ (i.e., whether to go the dentist) that she faced in the past. The past tense and the adverbial *kinoo* 'yesterday' shift the index of evaluation to a moment in the past. Absent further modification, the frame-setting adverbial is likely to locate in the past also the event described by the prejacent; that is, the sentence is typically understood as being about a visit to the dentist to be taken within yesterday. (This is often but not always the intended reading. See below for examples involving past deliberation about future actions.) The prejacent proposition ('I go to the dentist yesterday') is therefore settled at w_c and t_c. That is, the speaker has made a decision. However, (19) presupposes that Δ is not nailed at $\langle w_c, t_c \rangle$; given that a decision has been made and that the speaker has to know her own subjective preferences, the only possible reason is that she made the wrong decision, which, as inferred from the assertive content, is that she did not go to the dentist; hence the counterfactuality of p.

[6]That said, we could conceivably derive this effect even if our semantic definition were to anchor the relevant preferences to the past index $\langle w_c, t' \rangle$, provided that we treat those preferences as among the worldly facts that are subject to hindsight. This route was explored with regard to a different but related set of facts, Japanese past desire reports, by Mizuno and Kaufmann (2022). In this paper we remain non-committal as to the exact mechanism by which current preferences enter the reassessment of past decisions.

Our analysis also correctly predicts that (20) (repeated from (12)) is infelicitous.

(20) **Context (Uncertainty)**: John hesitated whether to attend the class yesterday. Today I heard from another student in that class that the professor held a helpful review session for the exam. I don't know if John went in the end. I happen to see John and say:

??*Kimi-wa kinoo-no zyugyoo-ni ik-u* ***beki dat-ta*** *(kedo,*
you-TOP yesterday-GEN class-DAT go-NPST BEKI COP-PAST but
zyugyoo-ni-wa it-ta?).
class-DAT-TOP go-PAST
'You should have gone to the class yesterday. (Did you go to class?)'

(20) presupposes that Δ (i.e., whether John attends the class) is not nailed at the utterance time. The use of Past and the past indexical imply that *p* is settled at the utterance time, so John has made a certain decision. Given this, and given that the speaker knows her own subjective criteria, the only possibility is that she believes that a wrong action was taken, which, as inferred from the assertive content, is that John did not attend the class. This, however, contradicts her uncertainty regarding which action was actually made, hence the infelicity of the sentence.

Finally, our analysis can also explain why (21) (repeated from (13)) is infelicitous.

(21) **Context (Prevention)**: John hesitated whether to attend the class yesterday. In the end, he decided to attend, but got stuck in the elevator until after the class. His decision itself was a right one, as the professor held a helpful review session for the exam in the class. I know all this. I happen to see John and say:

#*Kimi-wa kinoo-no zyugyoo-ni ik-u* ***beki dat-ta*** *yo.*
you-TOP yesterday-GEN class-DAT go-NPST BEKI COP-PAST SFP
'You should have gone to the class yesterday.'

The reason for the infelicity is simply that Δ here is *nailed*, that is, John's decision to attend the class was optimal according to the speaker's subjective criteria: he should have taken another route to avoid the obstacles, but that would engage one in a separate decision problem, different from the one that the *beki*-statement here is addressing.[7]

4.2. When counterfactuality is obviated

4.2.1. Uncertainty about what's optimal

Takanashi (2010: pp.162–163) notes that in her corpus research of Japanese novels and newspaper articles, 859 out of 862 examples of the '*p beki dat-ta*' form were judged to imply the counterfactuality of the prejacent. One of the three exceptions involves an idiomatic expression '*tokuhitu su beki dat-ta*' ('was noteworthy'), which can be excluded as a non-genuine case. The other two actually involve the same sentential forms '*koo nar-u beki dat-ta no da*' (≈'should have been like this'). (22) illustrates one of them. (22a) is the translation of the preceding text.

[7]For instance, we could think of this as a local problem of 'how do I get to class', in the (hypothetical) context of 'If I want to get to class'. See Kaufmann and Kaufmann (2021) for the interaction between contextually salient decision problems and the felicity of conditionals with imperative consequents.

(22) a. ['Looking back now, it doesn't seem to me particularly surprising that I feel that things like this had been expected to occur from long ago. . . . ']
b. . . . *Koo nar-u* ***beki dat-ta no da.***
like this become-NPST BEKI COP-PAST FIN COP.NPST
'Things should have become like this.'

The preceding text suggests that the prejacent of (22b) (i.e., 'things become like this') did come out true. The other case of this kind Takanashi provides likewise involves a preceding text that suggests that the prejacent is true (see Takanashi 2010: p.162).

What we think to be characteristic of the case at hand is its particular utterance discourse: with the truth of the prejacent p taken for granted, what is at-issue is whether p was actually the right decision according to the relevant criteria. To support this idea, it is worth noting that (22b) sounds more natural if phonological prominence is placed on *beki* itself, suggesting that 'should' or 'should not' is the focus of the discourse.

Our analysis of *beki*, as stated, does not immediately account for the felicity of (22b), but it can be amended to do so. In the interest of brevity, we give only an informal outline of the required modification.

The main point to note is that (22b) is most naturally used in a context in which the question whether the course of action that led to the truth of the prejacent was in fact the best one, or can still be considered the best one, is being reconsidered, perhaps in light of new information. The speaker suspends her belief that that course of action was in fact the best one, for the sake of argument. We see a parallel between this kind of reasoning about *beki*-sentences and so-called Anderson conditionals (Anderson, 1951). A version of the classic Anderson sentence is given in (23a). The X-marking on these sentences makes intuitive sense if we assume, with Stalnaker (1975), that it signals the suspension of an assumption that is taken for granted. Here, that assumption concerns the symptoms that the patient shows. In virtue of this reasoning, (23a) conveys that the antecedent would be a good *explanation* for the truth of the consequent.[8] But while this intuition is clear enough, formal analyses of X-marking typically do not account for it, except for the generic statement that some assumptions are suspended. It is not our goal here to improve over this situation; we only want to point out the parallelism between Anderson conditionals and *beki datta* sentences like (22b), which can be brought out with the paraphrase in (23b). In view of this similarity, we assume that a successful account of the former will be adaptable, *mutatis mutandis*, to an account of the latter.

(23) a. If the patient had taken arsenic, she would have shown the symptoms that she is in fact showing.
b. If the decision problem had been nailed, the course of action would have been taken that was in fact taken.

As a side remark, we note that Takanashi actually speculates that *beki* in (23b) may not represent prioritizing necessity but rather concern 'schedules' or 'destinies'. This latter possibility of meaning is reminiscent of the 'normality' reading of English *should* highlighted in the previous literature (see e.g., Yalcin 2016). Takanashi also observes that some cases of Non-Past

[8]See Gärdenfors (1988) for a belief-dynamic account of explanation that crucially involves the retraction of the explanans.

beki appearing in the relative clause likewise seem to obtain such readings. In this paper we would like to leave open whether *beki* may productively obtain the putative nomality reading, though we think that the prioritizing flavor is equally conceivable for *beki* in (23b).

In addition to Takanashi's data, we observe that the counterfactuality of *p* can be easily obviated in interrogatives. (24) was collected from the web, which was posted on an online history forum as a prompt to get the discussion started.[9]

(24) *Rui.16-see-wa syokeesare-ru* ***beki des-ita*** *ka? Iken-o kudasai!!*
LouisXVI-TOP be.executed-NPST BEKI COP.POL-PAST Q opinion-ACC please
'Should Louis XVI have been executed? Please give your opinion!!'

As the speaker should know that Louis XVI was executed, we can assume that the truth of the prejacent *p* is taken for granted in the utterance context. As above, what is at-issue is whether *p* was right or wrong. Here the relevant perspective is shifted from the speaker to the addressee, due to the use of an interrogative. Because the speaker does not know the subjective criteria of the addressee, it cannot be taken for granted that Δ has been correctly resolved from the perspective of the addressee, hence satisfaction of the non-nailedness presupposition.

In a similar vein, the counterfactual inference does not arise when '*p beki dat-ta*' appears within an embedded interrogative, as shown in (25). Here the speaker makes it explicit that it is open whether Δ has been correctly resolved according to her criteria. The felicity of the sentence is predicted as above.

(25) [*Rui.16-see-ga syokeesare-ru* ***beki dat-ta*** *kadouka*], *watasi-ni-wa*
LouisXVI-NOM be.executed-NPST BEKI COP-PAST whether I-DAT-TOP
wakar-ana-i.
know-NEG-NPST
'I don't know if Louis XVI should have been executed.'

4.2.2. Frame-setting adverbials

In (19), we have seen an example where the frame-setting adverbial *kinoo* 'yesterday' shifts back both the index of evaluation and the event time of the prejacent. With sufficient contextual support, it is possible for a frame-setting adverbial to shift only the index of evaluation (and hence the modal perspective, in the sense of Condoravdi 2002), without shifting the event time of the prejacent predicate into the past.

(26) **Context (New information 1):** The speaker has offers from multiple PhD programs, including MIT. She has yet to make up her mind. MIT looked like the best option until yesterday, but today she found out that her desired adviser is leaving there.
Kinoo made-wa, watashi-wa MIT-ni ik-u beki dat-ta. (Demo
yesterday until-TOP I-TOP MIT-DAT go-NPST BEKI COP-PAST but
ima-wa tiga-u.)
now-TOP be.not.true-NPST
'Until yesterday, I should have gone to MIT. But now, that's not the case anymore.'

[9] `https://www.clearnotebooks.com/ja/questions/443838`, last accessed on January 25, 2024.

Importantly, this example does not give rise to a counterfactual inference, i.e. it does not imply that the speaker will go to MIT. This is possible thanks to the mismatch between the (past) modal perspective and (future) choice of action: the sentence says that until yesterday, going to MIT was optimal, though Δ is not yet decided at $\langle w_c, t_c \rangle$; hence, no counterfactuality inference is generated.[10]

Note that the same sentence is felicitous even when a choice was previously made, as in (27). Again, this example does not give rise to a counterfactuality inference.

(27) **Context (New information 2):** The speaker has offers from multiple PhD programs, including MIT. She accepted MIT's offer yesterday, because her desired advisor is a faculty member there. Today, she finds out that the professor is leaving MIT next year. Unfortunately, the offer she accepted cannot be withdrawn.

Kinoo made-wa, watashi-wa MIT-ni ik-u beki dat-ta. (Demo
yesterday until-TOP I-TOP MIT-DAT go-NPST BEKI COP-PAST but
ima-wa tiga-u.)
now-TOP be.not.true-NPST
'Until yesterday, I should have gone to MIT. But now, that's not the case anymore.'

Without spelling out a full account, we speculate that this example requires us to allow for the possibility that a decision problem that was previously nailed becomes not nailed at a later time. Intuitively, in (27), the speaker thought that the decision problem 'Do I go to MIT?' was nailed when she accepted the offer, but now she knows that it is not, due to the new information that the professor is leaving.

5. Conclusion and further research

We have developed an analysis for the Japanese modal expression *beki*, which serves to single out specific courses of events as optimal in light of subjective assessments. Similar functions are performed by weak necessity modals like English *ought* or *should* (on their non-epistemic uses). It has been observed that a number of typologically unrelated languages derive weak necessity modals by placing special morphological marking on strong necessity modals (which translate to English as *have to* or *must*). Specifically, von Fintel and Iatridou (2023) note that the marking found is the (e)X(tra)-marking characteristic of the consequents of conditionals about remote or possibly counterfactual states of affairs. They assume that this marking is crucially involved in the weakening of the modals' quantificational force. In light of the fact that X-marking is expressed as Past tense in languages like English, it is sometimes analyzed as involving a backshift (Past-as-Past), deriving counterfactuality effects in a way similar to what we have assumed for *p-beki dat-ta*.

However, while in Japanese some counterfactual conditionals are marked with Past tense, the distribution of this marking and its semantic semantic contribution differ from the English

[10] One complication of (26) (as well as (27) below) is that hindsight effects seem to be absent: to say truthfully that going to MIT was optimal until yesterday would require us to ignore the fact that my desired advisor is leaving, which was learned only at a later time. We do not have an account of why this is the case, but note that the absence of hindsight effects may result from the frame-setting adverbial *kinoo made-wa* 'until yesterday'.

case. The X-marking on English weak modals is the same as that in English 'Simple Past subjunctives' (Ippolito, 2013), but the Japanese counterparts of English 'SP subjunctives' are not X-marked (they are not distinguished from indicatives). Instead, Japanese Past-marked conditionals correspond to English 'Past Perfect subjunctives'. The latter are distinguished in English by an additional Perfect morpheme (*would have V-ed* as opposed to *would V* – see Ippolito 2013); the closest analogs among weak modals are also Perfect-marked (*should have V-ed*, *ought to have V-ed*). Thus it seems that the Past marking in Japanese counterfactuals corresponds to the Perfect in English 'PP subjunctives', not the Past in English 'SP subjunctives'. Its semantic contribution is a shift back in time (Mizuno and Kaufmann 2019, 2022; Mizuno 2023).[11] Our analysis of *beki dat-ta* as involving a backshift to revisit a past decision problem thus assimilates *beki dat-ta* to English 'PP subjunctives' as well as its closest English translation *should have*. This leaves open whether Non-Past *beki da* is a true indicative form or the equivalent of English SP-X-marking (for recall that the latter is not marked on Japanese conditionals).

Recently, Ferreira (2023) described a Portuguese lexical expression of weak necessity (*dever*) which, just like strong necessity modals, can be (SP-style) X-marked to express suspension of presuppositions to make room for an unlikely or counterfactual prejacent. Similar to *dever*, Japanese *beki* is associated lexically with weak necessity (but restricted to the prioritizing modality, unlike *dever*). In our analysis, the backshift expressed by *beki dat-ta* is then a form of X-marking, however not the one associated with the formation of weak necessity modals per se, but as expressing a kind of backshift as associated with PP-style X-marked conditionals. In this paper, we have aimed to account for the presence and absence of counterfactual inferences in terms of the speaker's assessment of a (past) decision problem as "not nailed", hence in need of re-deliberation. A first informal investigation of English *should have* suggests that the expression behaves similarly to *beki dat-ta* in terms of when an inference to the counterfactuality of the prejacent can be avoided. More crosslinguistic research will be needed to fully determine the connection between different types of necessity modals, different types of X-marking, and the contextual factors responsible for the presence or absence of counterfactual inferences.

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[11] Ogihara (2014) has provided a Past-as-Modal analysis of the Past in Japanese counterfactuals, but this leaves unexplained why it cannot appear in the Japanese counterparts of genuinely counterfactual English 'SP subjunctives'.

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