Aspect and Scope in Future Conditionals[*]

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Abstract

This paper argues that though *will* and *be going to* both involve a future modal, their meanings differ aspectually. *Be going to* includes a progressive-like aspectual operator that takes scope over the future modal. *Will,* on the other hand, is ambiguous between a reading that is the future modal alone, and a reading that has a generic-like aspectual operator over the modal. The evidence for these logical forms consists primarily of modal effects caused by aspectual operation on the temporal argument of the future modal's accessibility relation. Similar evidence motivates a proposal that future modals in conditionals can have scope either over or under the antecedent of the conditional. These findings argue against analyses that treat futures as a kind of tense, and suggest possible directions for theories of aspect, modals, and conditionals.

Contents

1 Introduction

The goal of this paper is to provide a better understanding of futures in general, through comparison of *will* with *be going to*. *Will* and *be going to,* I will argue, contain the same future modal, differing only in aspect. *Be going to* has a progressive-like operator located just under tense and over the future modal, while *will* initially at least seems to have no aspectual component. *Will,* however, is later argued to be ambiguous between an aspect-free reading and a reading with a generic-like aspectual operator. In all these cases, the aspect, or lack thereof, has detectable effects on the temporal argument of the future modal's accessibility relation.[1] A class of apparent counterexamples to the *be going to* proposal is shown to involve a different scope for *be going to*, and a class of apparent counterexamples to the *will* proposal is accounted for via a reading of *will* with generic aspect. Subsequently the evidence for scope distinctions among *will* conditionals is examined. We are left with a fairly varied picture of future conditionals. To the extent that accessibility relations must be invoked to explain the

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[1]The effect of higher aspect on modals has not been much remarked upon; in fact, the very existence of aspect in that position has not been much remarked upon (Cinque (2002), Tenny (2000)). However, since we know that higher *tense* has an effect on the temporal argument of accessibility relations, perhaps we should not be too surprised to see aspectual effects as well.

properties of *will* and *be going to*, we have additional evidence that futures such as *will* and *be going to* are not tenses, but rather are (or at least contain) modals.

2   Aspect of *be going to*

In this section I offer a puzzle about offering, and solve the puzzle by proposing an aspectual difference between *be going to* and *will*. The puzzle is this: Why can *will* be used to make an offer, while *be going to* seemingly cannot be? The eventual solution is that *be going to* consists of a progressive-like aspectual operator on top of a future modal, and that this combination conflicts with a pragmatic requirement on acts of offering.

2.1   An offering puzzle

As a first step in the argument that *will* and *be going to* differ aspectually, it is necessary to demonstrate that *will* and *be going to* do in fact differ in meaning. It is not immediately obvious that they do; in some contexts, as in (1), they seem almost interchangeable.

(1)   a.   It will be sunny tomorrow
         b.   It's going to be sunny tomorrow.

Certain contexts, however, bring out clear assertability differences. Consider the sentence in (2a), seen outside Madera, California, on a billboard advertising a mechanic's shop. The sentence in (2b) was not on the billboard, and in fact could not felicitously have been used there.

(2)   a.   We'll change your oil in Madera. $\sqrt{}$offer
         b.   We're going to change your oil in Madera.   #offer

Thus here is a difference between *will* and *be going to*. Intuitively, (2a) is used to make an offer that you can take or leave. But the sentence in (2b), in the context given, is not an offer. Rather, it is somewhat bullying. The threatening nature of (2b) seems to stem from the intuition that there is no chance for you to have a say in the matter.

   Here is another, less threatening example of *be going to* being incompatible with making an offer.

(3)   We don't have anyone yet to make coffee for the colloquium. Can we
        have a volunteer?

    a.   I'll make coffee. $\sqrt{}$offer

    b.   I'm going to make coffee.   #offer

The intuition, similarly to the oil change context, is that in (3), the being-going-to-ness of the coffee-making is already underway; it's already been settled that it's going to happen, which seems somehow incompatible with the offering context. It is certainly felicitous to say (3b) in the context given, but only if the person asking for volunteers is mistaken in thinking that no one has plans to make coffee yet.

Though our discussion will center around the English forms, it is worth noting that other languages have futures that behave similarly. Indonesian and Turkish each have two different futures, for instance, exemplified in (4) and (5).

(4)   Turkish

    a.   Atla-r.
          Jump-AORIST
          'He (future) jump.'

    b.   Atla-yacak.
          Jump-FUTURE
          'He (future) jump.'

(5)   Indonesian

    a.   Budi akan   makan ikan.
          Budi AKAN eat   fish
          'Budi (future) eat fish.'

    b.   Budi mau makan ikan.
          Budi MAU eat   fish
          'Budi (future) eat fish.'

As in English, offering contexts reveal a difference between the futures in these languages. Of these future forms, offers can only be made with Indonesian *akan* and the Turkish Aorist.[2] In contrast, the Turkish Future and Indonesian *mau* cannot be used to make offers:

(6)   Turkish

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[2]Traditional terminology rears its ugly head: The Turkish Aorist is used to talk about the future despite the fact that Aorists in other languages are used to talk about the past.

We don't have anyone yet to make coffee for the colloquium. Can we have a volunteer?

a. Ben kahve yap-ar-ım.
   I   coffee make-aorist-1sg
   'I (future) make coffee.' $\sqrt{}$offer

b. Ben kahve yap-acağım.
   I   coffee make-future-1sg
   'I (future) make coffee'   #offer

(7) Indonesian
     We don't have anyone yet to make coffee for the colloquium. Can we have a volunteer?

a. Saya akan membuat kopi.
   I   akan make   coffee
   'I (future) make coffee.' $\sqrt{}$offer

b. Saya mau membuat kopi.
   I   mau make   coffee
   'I (future) make coffee.'   #offer

In the (b) cases, the speaker is reporting on an already-existing plan for the speaker to make coffee, rather than volunteering on the spur of the moment.

Suppose we consider in more depth what it is to make an offer. First, the contribution of the speaker. It seems clear that only someone who believes they can say whether an eventuality happens or not can felicitously make an offer for that eventuality to happen. I cannot felicitously offer for it to rain tomorrow, for instance, because I have no power over the weather, and I know it. So in order for an individual s ("speaker") to be able to make a valid offer to carry out a q-eventuality (an eventuality of which a predicate q holds), s must have power over whether a q-eventuality holds occurs. Let's call this ability (without going into a precise modal characterization of ability) *direction*.

(8) An individual s *directs* q just in case s has the ability to determine whether q happens.

The one to whom the offer is made, whom I will refer to as h ("hearer"), also seems to have some control over whether the q-eventuality occurs. It should happen if h wants it to happen, and, equally importantly, it should not happen if h wants it not to happen. It would certainly be rude for someone to make an assertion that entails that in some cases where you do not want

them to change your oil, they do it anyway. For an utterance to count as an act of offering, the speaker's carrying out of the offered eventuality has to be contingent on the interlocutor's preferences.

Let's treat a sentence of offering as a conditional with an elided antecedent *if you want q*, an overt consequent *will q*, and a presupposition that d has power over whether a q-eventuality occurs. The offerer s, in uttering that sentence in good faith, asserts the truth of that conditional. On a Lewis-Kratzer-style account of conditionals (Lewis (1986), Kratzer (1986)), s asserts that in all worlds where h wants q, a q-eventuality happens. And let us further agree that in making a valid offer, s is also committed to the truth of the proposition expressed by the conditional *If you don't want q, won't q* (where *don't want = want not*). This commitment reflects our intuition that the hearer's desires have an effect on whether a q-eventuality happens; it happens only if the hearer wants it to. Note that this commitment is not required by anything about the semantics of the conditional, but rather is just a pragmatic requirement on offers.

We also need a condition on offers. (I have abbreviated the intensional verbs *want* and *believe*; w-t-*believe*, for instance, is short for "believes in w at t," with the usual possible world semantics.)

(9)   *Condition on offers:* A person s offers in w at t to bring about a q-eventuality for h only if s w-t-believes that: $\forall w'$ that agree with w up to t: [$\exists t'$ such that s directs q in w' at t': [h w'-t'-wants q $\Leftrightarrow$ $\forall w''$ that agree with w' up to t': [$\exists t'' > t'$: [q(w'')(t'')]]]]

Now let's see how this characterization of offering intuitively conflicts with the semantics of *be going to*. According to our assumption, an offering utterance is interpreted with a certain kind of antecedent, whether or not it is pronounced. In that case, the billboard utterances actually have the meaning of the conditionals given in (10):

(10)   Revision of the billboard utterances
   a.   (If you want us to change your oil in Madera,) we will change your oil in Madera.
   b. #(If you want us to change your oil in Madera,) we are going to change your oil in Madera.

The problem with (10b) seems to be a conflict with part (b) of the offering condition in (9), instantiated in this case as follows:

(11)   If you don't want us to change your oil in Madera, we won't change
        your oil in Madera.

While (11) feels consistent with (10a), it feels inconsistent with (10b). This
intuition is what is responsible for the feeling noted earlier: Felicitous offer-
ing requires the offerer to take the hearer's desires into account, but using
be going to feels like a decision has already been made, without prior con-
sultation with the hearer.

The question we have arrived at is this: What is it about the meaning
of *be going to* that causes (10b) to contradict (11)?

The answer to this question, I propose, is that *be going to* consists of a
progressive-like aspectual operator scoping over a future modal. The pro-
posed structure is as in (12a) below. Tense is marked on the progressive
auxiliary, yielding *was/were going to*.[3] Note that (12a) is minimally differ-
ent from a proposal for the logical form of *will* and *would* (Abusch, 1985),
shown in (12b).

(12)   a. *Be going to* (Copley 2001, 2002a, b)
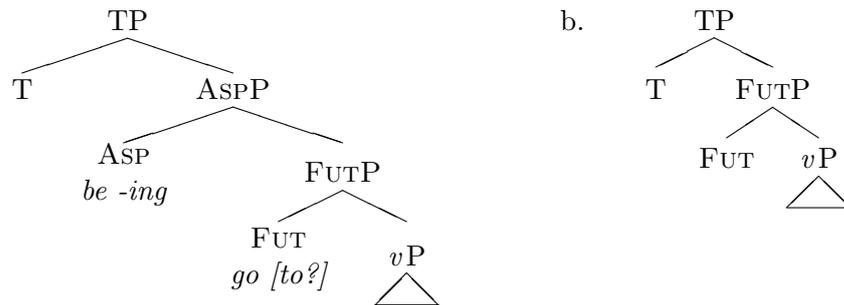
Two considerations motivate the proposed structure in (12a). The first
is morphological. *Be -ing* often marks progressives; perhaps it does just
that, or something quite like that, in *be going to.* English is notorious for
reusing morphology, but the presence of *be -ing* should at least prompt an
investigation into the possibility of progressive semantics. And if we decide
to take the morphology seriously, and if we believe in the Mirror Principle
(Baker, 1985), the future projection, presumably *go*, ought to be lower than
the aspectual head, which is itself lower than the tense head.

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[3] *To* is not separable from *going* (Copley, 2001), giving the impression that *be going to*
is something of an idiom. It is not unusual for constructions to lose transparency as they
progress from main verb to tense/aspect marking (Dahl, 1985).

The second consideration is semantic in nature. The core meaning of progressives involves a kind of "ongoingness;" if John was singing, then at the time under discussion, the John-singing eventuality was already ongoing. Recall the intuition about why *be going to q* is not a felicitous offer: It's already true that a q-eventuality will happen, so the hearer has no chance to say yea or nay. We may understand this fact as reflecting a kind of "ongoingness," not of the eventuality itself, but of the *futurity* of the eventuality. If so, this intuition is another reason to give serious attention to the idea that there is something like a progressive scoping over the future element.

To evaluate the hypothesis, we need to flesh it out with specific future and progressive-like elements from among the existing literature.

Thomason (1970) provides a temporally-relativized modality, drawing in part on technology from van Fraassen (1966). A version of Thomason's future operator is given in (13) below.

(13)   For any time t and world w, $\text{FUT}(w)(t)(q)$
$$= 1 \text{ if } \forall w' \text{ that agree with w up to t:}$$
$$\exists t': t < t' \text{ and } q(w')(t') = 1;$$
$$= 0 \text{ if } \forall w' \text{ that agree with w up to t:}$$
$$\neg\exists t': t < t' \text{ and } q(w')(t') = 1;$$
and is undefined otherwise.

The definition in (13) says that for any instant t and world w, $\text{FUT}(w)(t)(q)$ is defined just in case all the worlds share a truth value for q at the time in question. Then, if $\text{FUT}(w)(t)(q)$ is defined, it is true if on all worlds that agree with w up to t, there is some time t' that is later than t, at which q is true; and it is false if on all worlds that agree with w up to t, there is no time t' that is later than t at which q is true.[4]

(14)   A case in which $\text{FUT}(w)(t)(q)$ is true

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[4]The first clause of the denotation is insufficient; the other clauses must be added to account for excluded-middle facts. For example, *There will not be a sea battle tomorrow* is not true in a case where on some possible futures there is a sea battle and on other possible futures there is no sea battle. This discussion goes back to Aristotle's *Physics*. I argue in Copley (2002b) that the future Law of the Excluded Middle derives from the nature of the ordering sources used in future modals; here it surfaces as the idea mentioned above that one either wants q or wants not-q, but the not-caring-about-q position is excluded. See also von Fintel (1997) for related discussion of the Excluded Middle.
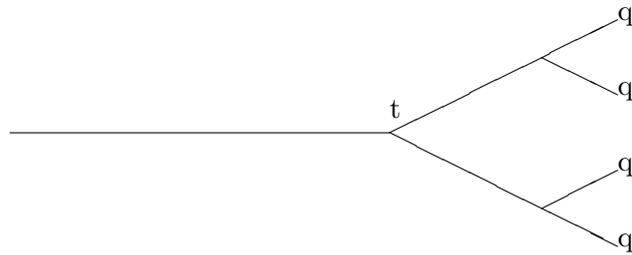
Let's use this modal in the semantics of *be going to.* Now, since we are trying to build up a denotation for *be going to* consisting of an aspectual operator and a future modal, we will also need an aspectual operator that can give us the "ongoingness" we require. Remember the "ongoingness" observed in *be going to;* what was ongoing, roughly, was the fact that a q-eventuality would happen in the future. The desired aspect is progressive; the "ongoingness" in *John was singing* is contributed by the progressive, the result being that a John-sing eventuality was ongoing at the time under discussion. Now to unpack that notion, beginning with a limited history of aspect.

The first notion one might have about time in language is that two times are necessary: the time of utterance, and the time at which the eventuality occurs. Present tense, as in (15a), would then require some overlap between these times, and past tense in (15b) would require a precedence relation.

(15)   a.   Tasha is here.
        b.   Tasha was here.

But as noted first by Reichenbach (1947), and further developed by Hornstein (1990) and Klein (1997), it turns out that at least three times are necessary to adequately describe the temporal and aspectual semantics of even very simple sentences. The present perfect sentence in (16a) below, the past sentence in (16b), and the past perfect sentence in (16c) can all be true when there is a past Alex-visit-Buffalo eventuality. The difference, according to the Reichenbachian line, is that in (16l), the time under discussion is the present, while in (16b) and (16c), the time under discussion is a past time. The latter two sentences are different because in (16b), the time of the eventuality is at the time under the discussion, while in (16c), the time of the eventuality precedes the time under discussion.

(16)   a.   Alex has visited Buffalo.
        b.   Alex visited Buffalo.
        c.   Alex had visited Buffalo.

The time under discussion, termed "Reference Time" by Reichenbach (and "Topic Time" by Klein) thus is an additional time, neither the speech time nor the time of the eventuality. The inventory thus consists of three times.

(17)   a.   Speech time   S
              b.   Reference time (or Topic time)   R
              c.   Event time (or Situation time)   E

To account for the patterns of temporal relations observed in (16), the following relations should be associated with present, past and perfect[5] morphology respectively.

(18)   a.   Present: R overlaps S
              b.   Past: R before S
              c.   Perfect: E before R

Klein goes on to analyze perfective[6] aspect and imperfective aspect in similar terms. (Smith (1991) among others terms these "viewpoint aspect" to distinguish from the perfect.) There is a time under discussion, and perfective aspect, as in (19a), requires the time of eventuality to occur within the time under discussion, while imperfective aspect, as in (19b) requires just the opposite.[7] Both sentences are past tense, so both have R before S.

(19)   a.   Zoe sang.   perfective aspect: R includes E
              b.   Zoe was singing.   imperfective aspect: E includes R

I will essentially adopt these definitions,[8] with one caveat. While the S, R, and E designations for times are useful, they are not to be thought of as an integral part of the definition of viewpoint aspect. Rather, viewpoint aspect is simply a relation between two times; in general, which times an operator relates depends on where in the structure the operator is. The reason for this

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[5]Incidentally, there are serious problems with this analysis of the perfect; cf. Iatridou et al. (2001).

[6]Not to be confused with "perfect". Traditional terminology strikes again.

[7]The English progressive can be thought of as a particular kind of imperfective; see Smith (1991) or Binnick (1991) for a sensible taxonomy of imperfectives.

[8]Of course there has been a good deal of recent work on aspectual operators that quantify over events instead (Landman, 1992), or situations (Cipria and Roberts, 2000). Without impugning the advantages of this kind of approach, such an operator would excessively complicate the picture, as well as requiring a very different notion of what an event or a situation is.

is that it is possible to have more than two temporal/aspectual operators, and thus more than three times. For example, in (20), if past tense relates S to R, and the perfect relates R to E, we cannot have the progressive (imperfective) also relating R to E. Rather, it should relate the perfect's second relatum to E (if we keep the intuitive definition of E). So another time is required.

(20)   Max had been singing.

We will see shortly that such a situation arises in the discussion of *be going to* as well. Thus I will use a denotation for the progressive that does not make reference to the Reichenbachian times. The function P in (21) below is taken from Bennett and Partee (1978); like Klein's operator, it expresses progressive aspect as a temporal inclusion relation. Unlike Klein's, its times have no special names. This is what we want.[9]

(21) $P(w)(t)(p) = 1$ iff $\exists t' \supset t$: $p(w)(t')$
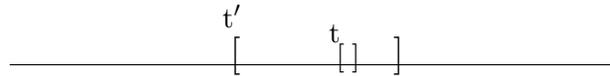
Now we can return to our *be going to* puzzle, to see if the idea of progressive aspect scoping over a future modal can explain the judgments.

Let us assume that present tense is null, and that *will* is just Thomason's modal FUT, while *be going to* has the proposed structure, with a Bennett and Partee progressive P scoping over the Thomason modal FUT, as expanded below.

(22) $P(w)(t)(\text{FUT}(q)) = 1$ iff $\exists t' \supset t$: $[\text{FUT}(w)(t')(q) = 1]$
          $P(w)(t)(\text{FUT}(q)) = 1$ if $\exists t' \supset t$: $[\forall w'$ that agree with w up to t':
          $[\exists t'': t' < t''$ and $q(w')(t'') = 1]]$

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[9]This denotation of progressive aspect (Bennett and Partee, 1978) runs afoul of the imperfective paradox, as noted by Dowty (1977), Dowty (1979). Thus P cannot be the denotation of a "real" progressive. In Copley (2002b), I argue, following Dowty and others (Landman (1992), Portner (1998), Cipria and Roberts (2000)) that "real" progressives have a modal component as well as this temporal component. I diverge from earlier accounts by pointing out a number of similarities between the modal component of "real" progressives and the future modal. Both "real" progressives and progressive futures consist of a temporal component and a modal component, making languages that use some of the same morphology for both (e.g. Haitian Creole, (Dechaine, 1991)) less mysterious.

How can we characterize the set of worlds quantified over by this denotation of *be going to*? P, evaluated at t, w, and p, yields a truth value of 1 just in case p holds over a superinterval t' of t in w, where t is an internal interval of t'. *Be going to* represents a case where p is $\text{Fut}(q)(w)(t')$ (for some q).[10]

The worlds *be going to* quantifies over are not just the set of worlds $\text{Fut}(q)(w)(t)$ quantifies over, i.e., those that branch off during t, but a larger set of worlds: the worlds that branch off during some interval t' that surrounds t. We would represent the worlds *be going to* quantifies over as below in (23). If $[\![be\ going\ to]\!](q)(w)(t)$ is true, that entails that all the worlds pictured branching off during some t' are q worlds, as shown in (23).

(23)   A case in which P $(\text{Fut}(q))(w)(t)$ is true
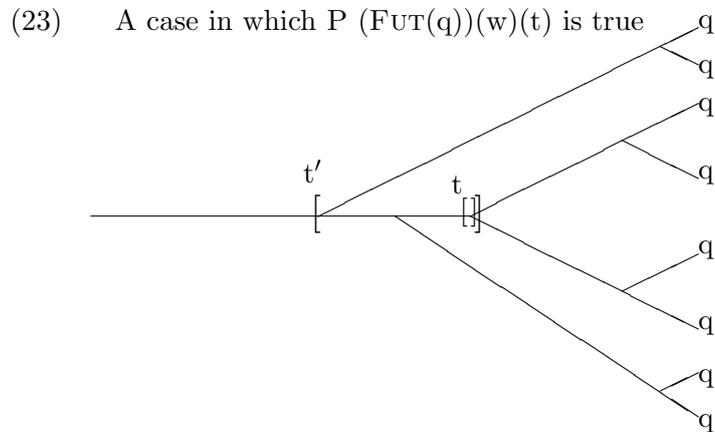
Be going to therefore quantifies over not only the worlds that Fut would quantify over given the same arguments, but also over additional worlds — those that branch off during t' but before the beginning of t — as long as t is not an initial interval of t'. While we could explicitly define the relation between t and t' to exclude such a possibility, there is no need to do so if we adopt a common[11] assumption that the actual world only exists up to the time of utterance; equivalently, that future world-time pairs are not available except via modal means.

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[10]Thomason's original operator must be altered slightly so that it takes intervals rather than instants. The change is to substitute "agree with w up to the beginning of t" for "agree with w up to t" in the denotation of Fut. Intuitively, we can speak of branching worlds that branch off during an interval, rather than at an instant.

[11]See, among others, Prior (1967) and Abusch (1998) for independent justification of this assumption.

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2.2 Solving the puzzle

We are now in a position to return to the puzzle about offering, and explain why the speaker of (24)a (i.e., the billboard *be going to* utterance with the elided antecedent made explicit) cannot also consistently assert (24)b, part of the offering condition.

(24) a. #If you want us to change your oil in Madera, we're going to change your oil in Madera.
      b. If you don't want us to change your oil in Madera, we won't change your oil in Madera.

Let p = the proposition expressed by *you want us to change your oil in Madera* (in the context in question); q = the proposition expressed by *we change your oil in Madera* (in the context in question); and t = a time at or after the reading of the billboard (i.e., the time when it matters whether the hearer wants q, and at which the offerer is prepared to bring about a q-eventuality). Then ((24)a) and ((24)b), the incompatible utterances from the puzzle, turn out as follows.

(25) a. all worlds w such that p(w)(t) = 1 are worlds in which
         P(w)(t)(FUT(q)) = 1
      b. no worlds w such that p(w)(t) = 1 are worlds in which
         FUT(w)(t)(q) = 1

Now we will see how the current proposal derives the intuition that (25a) and (25b) are incompatible, solving the puzzle. Consider one of the worlds in which p is true at t. We can imagine possible worlds in which p is not true at t (i.e., worlds in which not-p is true at t, assuming contradictory negation for the sake of simplicity). These worlds would have to branch off from the p world before t. Of course, not all of the worlds that branch off before t are worlds that have not-p true at t; some of the worlds that branch off before t make p true at t. In general, for any interval t' which properly includes t, there will be some worlds that branch off from the actual world during t' such that not-p is true at t – given, again, that t cannot be an initial interval of t'. Now, let us further suppose that (25a) is true. Therefore on any world that makes p true at t, there is an interval t' such that all the worlds that branch off during t' make q true at some later interval. This state of affairs is given below in (26).

(26)
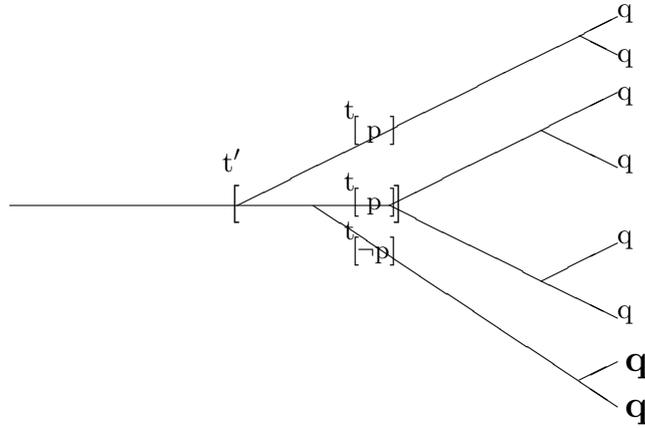
But now notice that in a situation in which (25a) is true — that is, in which there is an interval t' including t such that all worlds branching off during t' have q true at some later time — there can still be not-p worlds among these q worlds. Two such worlds in the diagram above are those with boldface, larger q. The existence of such worlds is inconsistent with the condition in (25b) that all not-p worlds are worlds in which not-q will happen (assuming that q and not-q are inconsistent). That, then, is why the *be going to* sentence can't be used to make an offer. This incompatibility with a condition on offering explains the infelicity of *be going to* in this context, and is the correct characterization of the puzzle.

That this is the right approach to the puzzle becomes clear when we consider contexts in which not-p worlds are assumed to be non-existent. In these contexts, *be going to* sentences don't sound so rude. Consider, for example, another possible billboard that you might see in Madera:

(27)   We're going to make you happy in Madera.

The sentence in (27) isn't exactly an offer, but neither is it entirely rude. The reason it is not so rude is that it is safe for the speaker to assume that there are no not-p worlds; that is, conceivably, provided you are already in Madera, there are no possible worlds in which you don't want to be happy in Madera. The utterance of (27) thus doesn't entail that any not-p worlds are q worlds. Hence no conflict with the offering condition emerges.

The puzzle we began with, i.e., that *be going to* cannot be used to make an offer, provided empirical support to the proposal that this construction involves two ingredients: progressive-like aspect and a future modal. The

modal semantics of *will* and *be going to*, we suppose, are indistinguishable, but because there is a temporal input to the accessibility relation, a difference in aspect means a difference in the set of worlds quantified over by the modal. In this case we saw that a progressive future conditional *If p, be going to q* will typically entail that some not-p worlds are q worlds, while a *will* conditional will not have such an entailment.

Let's call the entailment triggered by *be going to* the *anyway entailment,* since what is conveyed is that a q-eventuality will happen anyway whether a p-eventuality happens or not. From our investigations so far, it seems that the anyway entailment should be characterized as in (28):

(28)   *anyway entailment (first version):* Some not-p worlds are q worlds

Further investigation, however, shows that the anyway entailment is actually a stronger entailment than the entailment given in (28). It's not just the case that *some* not-p worlds are q-worlds; in fact, they all are, at least all that are under consideration.

Consider a conditional *If p, be going to q.* Above I argued that in such a case, all worlds that branch off within the interval t' provided by the temporal operator **P** are q worlds, and some of these worlds are expected to be not-p worlds. Thus, some not-p worlds are q worlds. The not-p worlds that branch off before the beginning of the interval t' may or may not be q worlds in such a situation.

But are worlds that branch off before the beginning of t' under consideration at all? We must assume that they are not. If we really are including not-p-and-not-q worlds like (28a), below, in our calculations, we are also forced into including worlds like (28b), in which both p and not-q. But we can't include such a world, as it would contradict the semantics of the conditional, which requires that all p worlds be not-q worlds. So apparently worlds that branch off before t' should not be considered.

(29)

q

q
q

q

q

t'
[

$t_{[\neg p]}$
$t_{[p]}$
$t_{[p]}$
$t_{[p]}$
$t_{[\neg p]}$
$t_{[p]}$

q

q

q
q

¬q   a.

¬q   b.
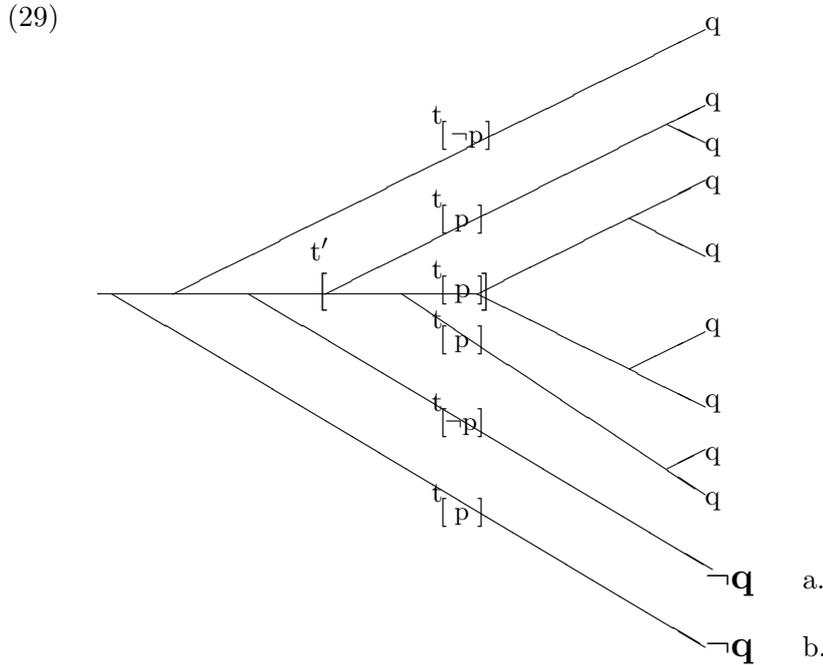
This requirement is a version of a familiar one. Of course we do not consider worlds that were possible but are no longer possible. For example, if I assert that I am going to change your oil in Madera, we do not care that it was possible in the past for you to not want it (not-p) and me to not do it (not-q). Such a world is no longer possible. Let us call this principle "stingy branching", and state it as below. (For "reference point" substitute "Topic Time" or "time introduced/modified by tense" if you like.)

(30)   *Stingy branching (traditional):* Branching of possible worlds happens only at the reference point.

To consider formerly possible worlds, a past modal of some sort must be used. Then we are allowed to explicitly consider formerly possible worlds, apparently by virtue of the past morphology.[12]

Stingy branching, however, appears to throw out the baby with the bathwater, as it would forbid the consideration of worlds that branch off during t' but before t. These worlds, recall, were crucial to the explanation of why (narrow scope) *be going to* conditionals are anyway-entailing, so this

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[12]For a compositional analysis of the morphology in such conditionals see Ippolito (2002).

is not a desirable result. We need to update the principle of stingy branching to acknowledge that those worlds are under consideration:

(31)   *Slightly less stingy branching:* Branching of possible worlds happens only at intervals overlapping the reference point.

This principle allows branching during the overlapping interval, and forbids it for other intervals, as we require.

One might worry at this point that we have included too many worlds again. Surely many intervals overlap the reference point R; what is to keep us from considering worlds branching off from all those R-overlapping intervals? But this is a spurious question. The analogous question for past modals would be, what is to keep us from considering worlds branching off from all those past times? The answer to both is that in both cases, there is contextual restriction on the quantification. Tense morphology on modals tells us which worlds are in the restriction of the modal, according to where on the timeline they branch off. There is no reason why aspectual morphology cannot provide the same service.

At the end of all this, we are stuck with the stronger version of the anyway entailment: that all not-p worlds are q worlds, with a presupposition that there are such worlds. For if there are none, as in the case of *will*, the anyway entailment should not be triggered. Fortunately, this stronger version appears to be empirically justified.[13] Since the offering context conflicts with the weaker version, it also conflicts with the stronger version. Therefore, we can accept the stronger version of the anyway entailment, given in (32):

(32)   *anyway entailment (final version):* All not-p worlds are q worlds.

Contexts or uses of conditionals that entail the anyway entailment, I will call "anyway-entailing"; those that conflict with the anyway entailment, I will call "anyway-conflicting".[14]

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[13]Indeed it appears that there are no anyway-indifferent contexts, another reflex of the Law of the Excluded Middle, it seems.

[14]Again, it will be important to remember that the semantics of conditionals, by assumption, has nothing to say about the not-p worlds; i.e., there is nothing inherently wrong with *be going to* in conditionals per se. Whether a conditional conflicts with the anyway entailment has rather to do with the pragmatics of the particular conditional.

3 Scope of *be going to*

In this section we will see that the aspectual component of *be going to* provides a way to detect scope differences among *be going to* conditionals. The P aspect in *be going to* will have an effect on the accessibility relation of FUT no matter where it is located, but depending on whether P and FUT are interpreted in the consequent or outside of the entire conditional, the status of the anyway entailment will be different. We will expect to see the anyway entailment only if *be going to* is interpreted in the consequent; this fact will be used to point out cases in which *be going to* is not interpreted there.

3.1 Wide and narrow scope

We first need to get a bit more precise about the logical form of *be going to* conditionals. What drives the argument of the preceding section is the idea that all p worlds are "be going to q" worlds *at the time at which p is evaluated*. That is, the antecedent p and the constituent *be going to q* (= ASP FUT q) must get the same temporal argument. This is possible in a structure such as (33a), where *be going to q* is a constituent. This is not possible in a structure such as (33b) where *be going to q* is not a constituent, as *be going to* has scope over both *p* and *q*.[15]

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[15]As we begin to construct trees for future conditionals, we have an immediate choice to make: Does the future modal take two (overt) propositional arguments, as is frequently proposed for modals, or does it take only one, as we have been assuming along with Thomason? We have no need for FUT to take two overt propositional arguments in this case; if it needed two arguments we would have to put a null argument in. As this is unwieldy, I will continue to assume that FUT has only one propositional argument seen by the syntax. Of course I do not mean to rule out contextually-supplied, syntactically invisible restrictions on FUT.

(33)   a.   b.

narrow scope reading   wide scope reading
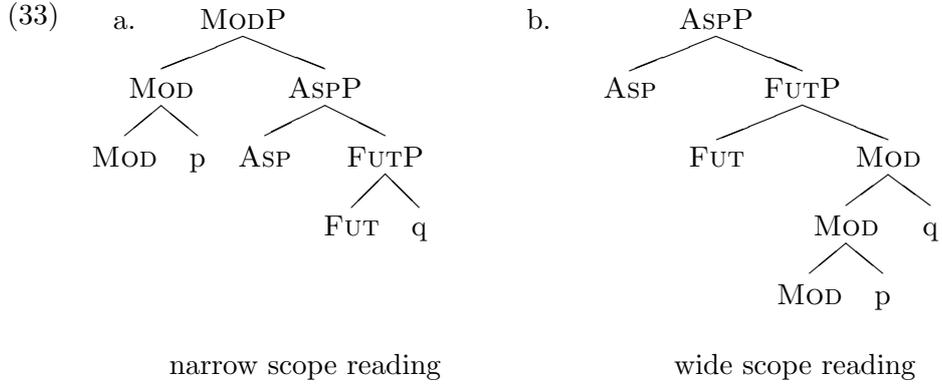
The informal meanings associated with the structures in (33) are given in (34); again, it is clear that the reading in which *be going to* has narrow scope is the one we want.

(34)   a.   if p, q is going to happen   narrow scope
       b.   it's going to be like this: if p, q   wide scope

To give a formal denotation for narrow scope *be going to* conditionals, let us assume a very bland modal semantics for the null modal:[16]

(35)   MOD(w)(t)(p)(q) = 1 iff
       $\forall$ w$'$ such that w$'$ is accessible from w,t and p(w$'$)(t):
       $[\exists t' \geq_q t:\ [q(w')(t') = 1]]$

The denotation of a narrow *be going to* conditional is given in (36), and that of a wide scope *be going to* conditional in (37).

(36)   Narrow *be going to:* For any time t and world w,
       = MOD(w)(t)(p)($\mathbf{P}$(FUT(q)))
       = 1 if $\forall$w$'$ s.t. w$'$ is accessible from w,t and p(w$'$)(t):
       $[\exists t' \supset t:\ [\forall\ w''$ s.t. w$''$ is accessible from w$'$, t$'$:
       $[\exists t''> t':\ [q(w'')(t'') = 1]]]]$

---

[16]$\geq_q$, briefly, would be a relation such that: if q is stative, $t' = t$; if q is not stative, $t' > t$. It is an old idea, in one version or another; c.f., e.g., Condoravdi (2002).

(37)   Wide *be going to:* For any time t and world w,
$\mathbf{P}$(w)(t)(Fut(Mod(p)(q))
= 1 if $\forall$w$'$ is accessible from w,t: [$\exists$t$'$ $\supset$ t:
[$\forall$ w$''$ s.t. w$''$ is accessible from w$'$, t$'$:
[$\exists$t$''$> t$''$: [$\forall$ w$''$ accessible from w$'$, t$''$
& p(w$''$)(t$''$): [$\exists$ t$'''$ $\geq_q$ t$''$: q(w$''$)(t$'''$) = 1]]]]]

Narrow scope *bgt*, as we have seen, does trigger the anyway entailment: worlds that branch off during t$'$ may or may not be p worlds, and must be q worlds. However, wide scope *bgt*, if it exists, would not trigger the anyway entailment, as there would be no not-p worlds under consideration. A branching diagram for a case where a wide scope *be going to if p, be going to q* is given below in (38).

(38)
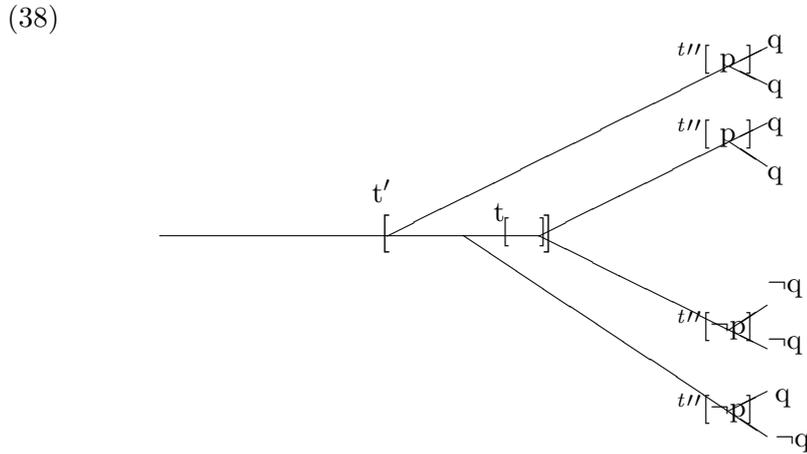
But is the wide scope *be going to* conditional reading attested anywhere? It appears that it is. Under certain circumstances, it is in fact possible to use a *be going to* conditional to make an offer, as in (39).

(39)   We're going to take good care of you before your defense.
   a.   If you want a manicure, we're going to give you a manicure.
   b.   If you want an oil change, we're going to give you an oil change.

These conditionals do present the manicure and the oil change as contingent on the hearer's desires. There still is something that does not depend on the hearer's desires; what is not negotiable in (39) is the idea that the speaker is going to take care of the hearer.

In addition to speaker intuitions that (39a,b) involve *be going to* scoping over the entire conditional, there is other evidence that (39a,b) are wide scope *be going to* conditionals. Since an offering reading is possible, it follows immediately that the anyway entailment is not triggered, just as we would predict for a wide scope reading. Furthermore, the offering reading disappears under *already:*

(40)   If you want a manicure, we're already going to give you a manicure.
          #offer

Supposing that *already* only takes a stative argument (Michaelis, 1996), and further supposing that our simple progressive P counts as a stativizer, *already* forces P to be interpreted in situ, i.e., a narrow scope reading. Forcing the narrow scope reading causes the offering reading to disappear; therefore the offering reading must be associated with the wide scope reading.

3.2   Indication and causal contexts

In this section we will consider some additional data to support the idea that *be going to* conditionals have two scope possibilities. We will be interested in conditionals that can occur in both indication and causal contexts; those in which the antecedent can either be the cause of the consequent, or merely an indication that the consequent will occur. Indication contexts turn out to be anyway-entailing; cause contexts turn out to be anyway-conflicting.[17] We will see that wide and narrow *be going to* behave as expected in these contexts.

Suppose you are babysitting an infant who has an upset stomach. Her father might say one of the following in his instructions to you:

(41)   If the baby cries...
          a.   ...she'll spit up.
          b.   ...she's going to spit up.

If the father says (41a), what he means is that her crying will cause her to spit up. He might follow up with, "So try to keep her from crying." If

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[17]For the time being, we will consider only examples in which the complement of the future modal does not have the subinterval property (Dowty, 1979). Even *will* conditionals that are anyway-conflicting with non-subinterval-property complements end up being consistent with the anyway entailment when the complement of *will* has the subinterval property.

he instead says (41b), he could mean either that her crying will cause her to spit up, or that her crying will inform you that her stomach is upset enough that she will spit up. In the latter case, soothing her crying will not be expected to have any effect on whether she eventually spits up. It is difficult, if not impossible, to use (41a) in that context.

The first context I will call the causal context, and the second, the indication context. We can verify that the causal context is indeed possible with *be going to* by making the indication context pragmatically implausible. The example in (42) rules out the indication context (because something you do yourself is not likely to be an indication to you of some other eventuality); thus we can see clearly that *be going to* is possible in the cause context.

(42)   If you hold the baby horizontally, she's going to spit up.

Or suppose that you are going to talk to an eccentric professor who you have never met with. Another student tells you what to expect ahead of time by saying one of the following:

(43)   If he hits his forehead with his hand...
        a.   ...he will tell you something important.
        b.   ...he's going to tell you something important.

If your fellow student says (43a), it might be rational, though perhaps not advisable, to contrive some way to make the professor hit his forehead, because in that case he will inevitably tell you something important! If your friend says (43b), however, you would probably not take that course of action; though it has that reading, the more sensible reading is possible as well.

As we did with (42), we can verify the intuition that the causal context is possible with *be going to* by using a conditional that is only possible in a causal context. Indeed, it is felicitous.

(44)   If you hit his forehead with your hand, he's going to tell you something important.

As with the offering cases, we can also check whether *already* has any effect on the anyway entailment. The indication reading of (45a) is possible, but the cause reading is impossible. The judgment is confirmed by the infelicity of (45b), which rules out the indication reading. With *already*, no reading is available at all, as predicted.

(45)   a.   If the baby cries, she's already going to spit up.   indication, #cause

         b. #If you hold the baby horizontally, she's already going to spit up.

So narrow scope *bgt* gets only indication readings, and wide scope *bgt*, along with *will*, gets only causal readings.

From this distribution, we would predict that indication contexts are anyway-entailing, and that causal contexts are anyway-conflicting. To find out how these predictions fare, we must first determine independently what indication and causal contexts entail for the not-p worlds (and thus for the anyway entailment).

Suppose a p-eventuality is a cause for a q-eventuality. What, if anything, can be said about q in the not-p worlds? There are two possible moves we could make here. We could say that a p-eventuality is the only cause for a q-eventuality, so that if a p-eventuality doesn't happen, a q-eventuality doesn't happen either, or we could say that a q-eventuality might have other causes, so that some not-p worlds are q-worlds.

While it is indeed often the case that an eventuality can logically have a number of different possible causes, in a particular situation, a not-p world should be a not-q world, all else being equal. This phenomenon is discussed by von Fintel (1999); some conditionals, among them causal conditionals, seem to be liable to be "perfectable" to biconditionals. This "Strawson entailment," he argues, is indeed an entailment, not merely an implicature, as long as the same context is maintained. (46a) does entail (46b) provided the context is not changed. Not only that, but (46c) is a reasonable corollary.

(46)   a.   If you strike this match, it will light.

         b.   If you don't strike this match, it won't light.

         c.   If you hadn't struck this match, it wouldn't have lit.

If von Fintel is correct, the condition on causes we want is the following.

(47)   *Cause condition.* If p causes q, all not-p worlds are not-q worlds

Note that it is not compatible with the anyway entailment that all not-p worlds are q worlds. Therefore causal contexts are anyway-conflicting, and the predictions are borne out. As in offering contexts, which are also anyway-conflicting, *will* and wide scope *be going to* are acceptable, but narrow scope *be going to* is not.

Now, indications. If it is the case that a p-eventuality indicates but does not cause a q-eventuality, it does not follow that if the p-eventuality had not happened, the q-eventuality would not have happened.

(48) a. If the dogs run around in circles, it's going to snow.
   b. If the dogs hadn't run around in circles, it wouldn't have snowed.

In the current proposal, consider a c-eventuality, which is not a compelling cause of a p-eventualities, but which is a compelling cause of q-eventualities. So in a world where a c-eventuality has occurred, some accessible worlds are p-worlds, but all accessible worlds are q-worlds. Supposing that the cause condition in (47) applies to non-compelling causes as well as compelling causes, we can assume that, in a p-world, a c-eventuality has happened. Therefore, since a c-eventuality is a compelling cause for a q-eventuality, a q-eventuality will happen. However, just because a world is a not-p world doesn't mean it is a not-c world. Hence, it is not evidence that a q-eventuality will not happen. So:

(49) *Indication condition.* If p is an indication of q, all not-p worlds are q-worlds

That is, indication contexts are anyway-entailing. This is entirely in line with the fact, demonstrated above, that narrow scope *be going to* conditionals are possible in indication contexts, while wide scope *bgt* conditionals and *will* conditionals are not.

For further evidence that we are on the right track, we turn to Turkish. Turkish has a morpheme traditionally called the Future, which I proposed earlier to be a progressive (P) future. By itself, the Future can only get a cause context (i.e., no anyway entailment), not an indication context. However, with an additional, higher modal, the indication context is perfectly acceptable:

(50) a. Bebek aḡla-r-sa,   kus-acak.
       Baby   cry-aor-cond, throw.up-fut.
       'If the baby cries, she's going to throw up.' $\sqrt{}$cause, #indication
   b. Bebek aḡla-r-sa,   kus-acak-tır.
       Baby   cry-aor-cond, throw.up-fut-modal
       'If the baby cries, she's going to throw up.' #cause, $\sqrt{}$indication

I am proposing something similar for English, except that in English, the conditional modal used in indication contexts is not pronounced, while in Turkish it is.[18]

So there is some support for an analysis of *be going to* conditionals as having two readings: one in which *be going to* takes narrow scope, as part of the consequent, and one in which it takes wide scope over the entire conditional.

So far, I have argued that *will* and *be going to* differ in the presence or absence of an aspectual operator on the modal, and that *be going to* in conditionals exhibits two different scope-taking positions. The evidence for these claims rests on the idea that an aspectual operator P, located higher than the future modal in *be going to*, triggers the anyway entailment, but only when *be going to* is in a certain scopal configuration with respect to the conditional.

4 Aspect of *will*

So far all the *will* conditionals we have encountered have been anyway-conflicting. But there is, in fact, an anyway-entailing context in which some *will* conditionals are acceptable; it is furnished by relevance conditionals. The existence of such conditionals should make us question the assumption that *will* does not include an aspectual operator. In this section I present evidence that *will* is ambiguous between the aspectless version we have been seeing, and a version with an aspectual operator, different from but similar to **P**.

Relevance conditionals are conditionals in which the antecedent seems to be a condition on the relevance to the hearer of the information in the consequent. Two examples of relevance conditionals are given in (51).

(51)   a.   If you want to know, there's some beer in the fridge.
       b.   If I may be frank, Frank is not looking good.

Unlike offering contexts, relevance contexts are anyway-entailing. We can see immediately that relevance conditionals are at least consistent with the anyway entailment; for example, the speaker of (51a) is not committed to (52a), nor is the speaker of (51b) committed to (52b).

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[18]In both languages, a modal lower than the future modal would not be pronounced.

(52) a. If you don't want to know, there is no beer in the fridge.
      b. If I may not be frank, Frank is looking good.

Therefore, in the context in which a relevance conditional *If p, q* is truthfully uttered, not all not-p worlds are not-q worlds. That is, some not-p worlds are q worlds. But actually, the stronger entailment can be demonstrated; that all not-p worlds are q worlds, making relevance an anyway-entailing context. Iatridou (1994) notes that relevance conditionals are not possible with *then*:

(53) a. If you're interested, (#then) there's some beer in the fridge.
      b. If I may be frank, (#then) Frank is not looking good.

Based on its distribution in various kinds of conditionals, Iatridou argues that the use of *then* in a conditional *If p, q* presupposes that not all not-p worlds are q worlds. If this is so, the impossibility of adding *then* to a relevance conditional *If p, q* points to a requirement that all not-p worlds be q worlds.

(54) *Condition on relevance conditions.* If p is a relevance condition on q, some not-p worlds are q worlds.

We predict that *be going to* should be possible in the consequent of relevance conditionals, and *will* (given slightly less stingy branching) should be impossible. The prediction seems at first to be borne out. While the conditional in (55a), using *will*, is not a good relevance conditional (but makes a fine offer), the conditional in (55b), using *be going to*, is a good relevance conditional (and as expected, is not a particularly good offer).

(55) a. If you want to know, we'll go get some beer.
          #relevance, √offer
      b. If you want to know, we're going to go get some beer.
          √ relevance, #offer

Interestingly, however, some *will* clauses seem to be good in the consequent of relevance conditionals. For example, if you wanted to report some prior knowledge of how the judges of a competition would vote, you might utter (56a). Similarly, (56b) is also acceptable.

(56)   a.   If you really want to know, John will win.

            b.   If you really want to know, Halley's Comet will next be visible in 22 years.

Thus while *will* behaves as predicted in contexts with no anyway entailment (offering and causal contexts), it is not terribly well-behaved in a context that requires an anyway entailment. Surprisingly, some *will* conditionals, given the right context, are acceptable as relevance conditionals.[19]

Interestingly, Indonesian does not allow *akan*, which we have taken to correspond to *will*, in the consequent of a relevance conditional. Instead a different morpheme *pasti* is used.

(57)   a.   Kalau kamu mau tuku, Budi pasti menang.

                 if   you   want know Budi PASTI win

                 'If you want to know, Budi will win.'

            b. #Kalau kamu mau tuku, Budi akan menang.

                 if   you   want know Budi AKAN win

This morphological split suggests that English *will* is ambiguous between an anyway-conflicting reading, corresponding to *akan*, and an anyway-entailing reading, corresponding to *pasti*.

It does seem that there is something special about the felicitous anyway-entailing *will* conditionals in (57). In order for a *will* conditional to be anyway-entailing, there seems to be some flavor of strong speaker certainty in these examples, though at this point it is hard to say what exactly. The same is true for *will* sentences that are *not* conditionals, as in (58).

(58)   a.   Oh, she'll show up, all right.

            b.   Don't worry, the Red Sox will win.

            c.   It'll work. Trust me. I know about these things.

And in Indonesian, sentences like these are possible with *pasti* but not with *akan*. Speakers similarly report that (59a) reflects a high level of certainty that it will rain.

(59)   a.   Pasti hujan.

                PASTI rain

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[19]Even worse, *will* remains impossible in indication contexts, which are also anyway-entailing; these facts are discussed below.

'It'll rain.'
  b. #Akan hujan.
      AKAN rain
      'It'll rain.'

On the other hand, we would not want to say that the corresponding *be going to* examples in (60), or the *mau* example in (61), reflect some lesser level of certainty. In these examples, too, the speaker is absolutely sure.
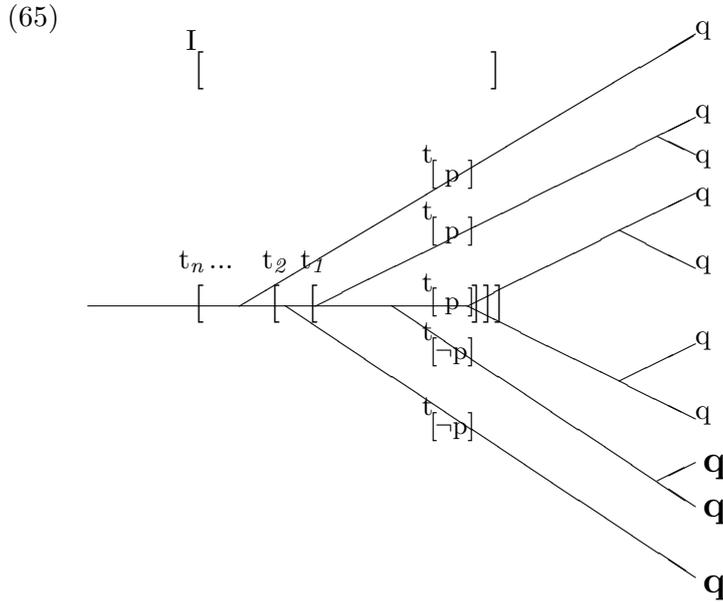
(60)   a.   Oh, she's going to show up, all right.
       b.   Don't worry, the Red Sox are going to win.
       c.   It's going to work. Trust me. I know about these things.

(61)   Mau hujan.
       MAU rain
       'It's going to rain.'

Yet, nonetheless, there is a clear intuition that *something* about the *will* and *pasti* sentences is stronger. Moreover, what is stronger has something to do with the speaker's evidence for the claim. Both the *will*/*pasti* examples and the *be going to*/*mau* examples rely on the speaker's evidence, but somehow, the *will*/*pasti* examples require more or better or more general evidence, or more strongly inevitable conclusions.

How might we capture this difference? Presumably we are dealing with quantification over epistemically accessible worlds. The usual way to characterize levels of certainty is to vary the strength of the quantification over the epistemically accessible worlds. The highest level of certainty corresponds to universal quantification, and increasingly lower levels of certainty correspond to increasingly lower levels of quantification. But in this case, as we have seen, we would not want to say that the lower level of "certainty" in the *bgt*/*mau* examples involves anything less than universal quantification.

However, we have another tool at our disposal; an aspectual operator on top of the future modal would allow *pasti* to quantify over a larger set of worlds than either *mau* or *akan* do. I would like to propose the hypothesis that an aspectual difference between *pasti* and *mau* is responsible for this intuition. Where *mau*, like *be going to*, has an existential quantifier over times, *pasti* and the anyway-entailing version of *will* have universal quantification. In both cases the times thus picked out represent the times from which the worlds branch. If we suppose in these cases that the branching is epistemic branching, then we can explain why the *will* sentences feel stronger. They

require q to be true on epistemically accessible worlds branching off not merely from *some* time overlapping the present, but from *all* (realis) times that overlap the present, within some contextually supplied domain interval I. This amounts to a requirement that the evidence for the statement be of relatively long standing.

For the formal details, we will proceed entirely in parallel to the *be going to* analysis, the only difference being the force of quantification. The proposed "dumb" aspectual component of anyway-entailing or G-future reading of *will* is given in (62), along with a timeline diagram illustrating the set of times that p(w) must hold of for G(w)(t)(p) to be true.[20]

(62) $G(w)(t)(p) = 1$ iff $\forall t' \supset t$: $p(w)(t')$

The times over which t' varies are all the subsets of I:

(63)

Combining G with FUT, our future modal, yields the following denotation.

(64) $P(w)(t)(\text{FUT}(q)) = 1$ iff $\forall t' \supset t$: $[\text{FUT}(w)(t')(q) = 1]$
        $P(w)(t)(\text{FUT}(q)) = 1$ if $\forall t' \supset t$: $[\forall w'$ agreeing with w up to t':
            $[\exists t''$: $t' < t''$ and $q(w')(t'') = 1]]$

And (65) represents a state of affairs in which $G(w)(t)(\text{FUT } q)$ is true.

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[20]As with the progressive-like operator P above, I use the single letter G in an attempt to evoke the traditional terminology "generic," for mnemonic purposes only.

(65)

As with *be going to* conditionals, we expect that all not-p worlds under consideration are q worlds (shown as worlds with boldface q), thus deriving the anyway entailment for narrow scope G-future *will*.[21]

As another piece of evidence that we are dealing with universal quantification over a set of epistemically accessible worlds, let us consider the fact that there is a conflict between uttering *will q*, and basing that claim on newly-acquired evidence. This fact is exemplified in (66). The use of *Look!* in in these examples forces a context in which the subsequent claim must follow from evidence that is new information. (66b) and (66d) demonstrate that this requirement is apparently incompatible with the meaning of G-future *will*.

(66)   a.   Look! It's going to rain!
        b. #Look! It'll rain!
        c.   Look! He's going to jump!
        d. #Look! He'll jump!

This pattern is exactly what we would expect if *will* in (66b) and (66d) involves universal quantification over epistemically accessible worlds branching off during the contextually salient time. In the relevant contexts in (66), it

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[21]Why narrow scope? Again, the branching of the conditional modal MOD is not depicted. (65) represents the evaluation of G (FUT q) on a single p-world.

is not the case that all of the epistemically accessible worlds are q-worlds, supposing that the contextually relevant interval is large enough to include the very recent time at which the evidence for q was acquired. Of course, when the evidence is of long standing, *will* is fine.

(67) a. Don't worry, it'll rain. It always does eventually.
      b. Oh, he'll jump. He's just that kind of person.

This is exactly what we would expect if the *will* in these examples is the G-future version of *will*. Of course, for this explanation to go through, we need to say why the aspectless, anyway-conflicting version of *will* cannot occur in these contexts. But the fact that Indonesian does not permit *akan*, which is anyway-conflicting, in such contexts (see (refakan) above), suggests that the anyway-conflicting version of *will* is in fact ruled out. We will take up this issue again in the next section.

An apparent problem with the G-future analysis of anyway-entailing *will* conditionals arises when we consider indication contexts, though these conditionals actually provide further support for the analysis when a certain reasonable assumption is made. Indication readings of conditionals force the future modal to be interpreted epistemically, and with narrow scope. In an indication conditional such as the one in (68), for instance, I have argued above that FUT is interpreted in the consequent, embedded under the conditional modal.

(68)   If the dogs run around in circles, it's going to snow.

The meaning of the example in (68) shows that it is the future modal, not the conditional modal, that is responsible for the epistemic modality. The conditional in (68) is true if all worlds in which the dogs run around in circles are worlds in which one can conclude that snow is on the way; the epistemic modality is interpreted in the consequent, and thus must be associated with the future modal.[22] So the modal base of the future modal in *be going to* indication conditionals is the same as the modal base of the future modal in G-future *will*. G-future *will* also occurs in another anyway-entailing context, as we have seen above. Therefore, we would expect to see G-future *will* conditionals in indication contexts.

However, indication readings of *will* conditionals are very difficult, if not

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[22]This understanding of indication conditionals supercedes the discussion of such conditionals in Copley (2001, 2002a,b), in which I had assumed that the epistemic modality was associated with the higher, null modal.

impossible,[23] to obtain. This is unexpected, as both indication and relevance conditionals are apparently anyway-entailing. The following conditionals seem only to be able to get the causal reading, not the indication reading. That is, for most speakers (69a) cannot convey that the dogs' running around in circles is an indication of impending snow, and so forth.

(69) a.   If the dogs run around in circles, it'll snow.   #indication
      b.   If the baby spits up, she'll cry.   #indication
      c.   If he hits his forehead with his hand, he'll tell you something important.   #indication

Although at first these examples look problematic, the present analysis can account for them, provided a certain assumption is made about the contextually salient interval. If we make the minimal assumption that the contextually salient interval must also include the topic time – an eminently reasonable assumption if the term "topic time" (Klein, 1997) is to mean anything at all – we can derive their unacceptability. The topic time in this case is the same as the speech time. If all the worlds branching off during all subintervals of the contextually salient interval are q worlds, and if the speech time is included in the contextually salient interval, it follows that all worlds branching off at the speech time are q worlds:

(70)
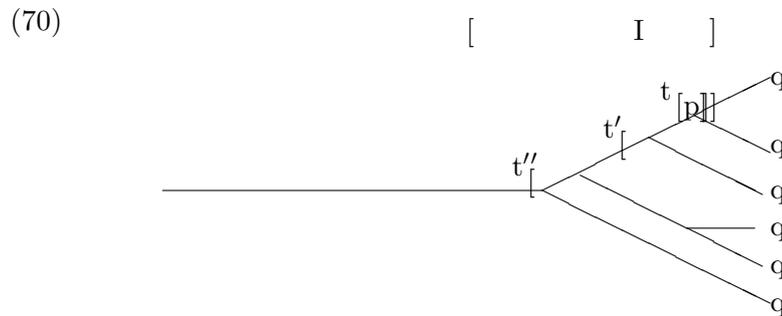
If in any p-world, G Fut q is true, then Fut q is true at the speech time. Thus it is a violation of quantity (say as much as you know) to assert that all p worlds are G Fut q worlds, because all worlds, p- or otherwise, that branch off from the speech time are q worlds. This argument accounts for

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[23]I have only found one speaker who finds *will* conditionals acceptable with indication readings.

the infelicity of the examples in (70).

We have seen evidence for a reading of *will* that behaves like a G-future. I have contrasted the G-future, anyway-entailing reading of *will*, with the aspectless future ("A-future", perhaps, with *A* standing for "aspectless" or "aorist"?), anyway-conflicting version of *will* that occurs in offering and causal contexts.

Before concluding this section, I would like to consider one possible objection to this line of argument. Maybe *will* is not ambiguous at all (goes the objection). Maybe there is only one aspectual value of *will*, namely the G-future reading. As with *be going to*, the narrow scope reading is anyway-conflicting, and the wide scope reading is anyway-entailing. We know from the *be going to* cases that scope ambiguity is possible with an aspectualized modal, and that it has exactly the effect we are attempting to explain here, namely, non-homogeneity with respect to the anyway entailment. There would be no need to posit two different aspectual values for *will*; G-*will* could do it all. Why not?

This alternative account would indeed be attractive, were it not for the fact that the intuitions simply do not line up. If someone offers to make coffee by saying "I'll make coffee," they do not mean that in all the relevant worlds branching off from within the entire contextually salient interval, if you want them to make coffee, they make coffee. Offering *will* rather seems to involve a "spur of the moment" decision. Indeed, *will* offers contrast with the wide scope *be going to* offers in that respect. Furthermore, it is possible to have just recently found out that someone has made an offer, as in (71).

(71)   Look! Marissa will make the coffee (if you want).

If the kind of *will* condtional used in offering were the wide scope G-future conditional, the acceptability of (71) would be unexplained.

Thus we may conclude, a bit reluctantly perhaps, that *will* itself is aspectually ambiguous. One version, the G-future, triggers the anyway entailment by way of universal quantification over the temporal argument of the future modal's accessibility relation, and the other, the A-future, has no such aspectual element. Both of these contrast with the P-future *be going to*, which involves existential quantification over the temporal argument of the future modal's accessibility relation. This theory appears to account for the data we have seen so far. But in discrediting the alternative theory and positing ambiguity of *will*, we have given ourselves more work to do, if we want a satisfying theory of future conditionals: We need to find out if both the

G-future version and the A-future version can have both wide scope and narrow scope, or if not, why not.

5   Scope of *will*

Recall that *be going to*, our P-future, has two different scope possibilities when in a conditional; it can occur either inside the consequent or scoping over the entire conditional.

(72) a.   b.

narrow scope reading   wide scope reading
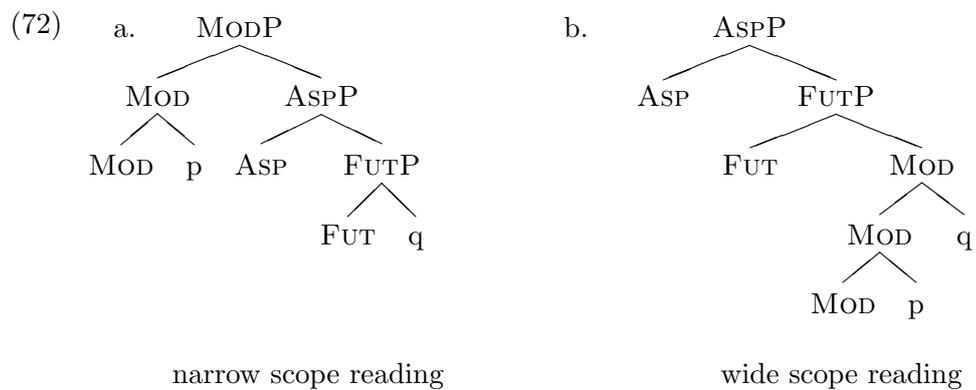
Likewise, we might expect both of the G-future readings of *will* to have both these scope possibilities, with G swapped in for P as the Asp head. If A-futures have some sort of null Asp head, the expected structures would be the same (if instead the A-futures have no aspectual position at all, the structures would be the same but without the aspectual head. For our purposes, these two options are equivalent).

Note that the presence of Mod and its antecedent p is crucial to the wide scope readings. By compositionality, the only antecedentless structure possible should be (73):

(73)
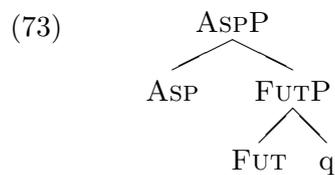
Semantically this structure should always behave like a narrow scope reading rather than a wide scope reading in triggering the anyway entailment that all not-p worlds are q worlds. In this structure, for any p, whether or

not p, q (anyway). Thus narrow scope readings should be anyway-entailing, and non-contingent, while wide scope readings should be anyway-conflicting, and contingent. This prediction has been borne out in the contexts we've seen; *be going to* conditionals have relevance and indication readings when *be going to* takes narrow scope, and offering and causal readings when *be going to* takes wide scope. Likewise, the G-future, anyway-entailing readings were non-contingent and had narrow scope, and the A-future, anyway-conflicting readings were contingent and had wide scope. Now we need to determine whether wide scope G-future conditionals and narrow scope A-future conditionals exist.

5.1   Wide scope G-futures

A wide scope G-future conditional should be anyway-conflicting and contingent like other wide scope conditionals. It should thus have offering and causal readings. A wide scope G-future conditional *If p, will q* should make a stronger statement than either a wide scope P-future or a wide-scope A-future conditional; it says thatfor all worlds that branch off during the contextually salient interval, if the world is a p-world, it is a q-world.

We can try to construct such examples in English, making sure that the context favors the stronger reading, but we are hampered by the fact that *will* can also be interpreted as an A-future. It's difficult to say whether the examples in (74) have both an A-reading and a G-reading. Even if the context supports the G-future semantics, it is impossible to say that it is actually a different reading, either in the offering context in (74a) or the causal context in (74b).

(74)   a.   Oh, he'll help you out if you ask him to. That's just the way he is.
       b.   Don't worry. If you put some more sour cream in there, it will thicken up nicely.

This difficulty should not dissuade us, however. The wide scope *be going to* conditionals are also very close in meaning to the wide scope A-future *will* conditionals; I would be hard pressed to describe the difference between the causal examples in (75), for example, in anything but theoretical terms, though intuitively there is a difference.

(75)   a.   If you hold the baby horizontally, she'll spit up.
       b.   If you hold the baby horizontally, she's going to spit up.

Because (75a) and (75b) use different lexical items, we are happy to say that (75a) and (75b) have two different logical forms, and speakers do detect a difference in meaning along the predicted lines. What we need to do, then, to detect wide scope G-future conditionals is to look at a language with a morphological distinction between A-futures and G-futures, such as Indonesian. And wide scope *pasti* conditionals do apparently exist. In offering contexts, while *akan* is ordinarily used, *pasti* can be used, e.g., to report that one's son will help, conveying that the speaker is certain the son will offer.

(76) a. Kalau kau mau, anak-ku akan membantu-mu.
         if   you want child-my akan help-you.
         'If you want, my child will help you.'
      b. Kalau kau mau, anak-ku pasti membantu-mu.
         if   you want child-my pasti help-you.
         'If you want, my child will help you.'

One of my consultants remarks, "*Pasti* will work but sounds stronger (how sure am I that my son will do it?)" This response is entirely expected for wide scope *pasti*: anyway-conflicting (thus acceptable as the report of an offer), and epistemic.

In our other anyway-conflicting context, causation, *pasti* also alternates with *akan*, occurring with a stronger, epistemic meaning. Both seem to work in (77); speakers report that *pasti* sounds better.

(77) a. Kalau kamu menjatuhkan vas ini, vasnya   akan pecah.
         if   you   drop   vase this vase-det A-fut break
         'If you drop this vase, it will break.'
      b. Kalau kamu menjatuhkan vas ini, vasnya   pasti pecah.
         if   you   drop   vase this vase-det G-fut break
         'If you drop this vase, it will break.'

In a different kind of causal context, as in (78), *pasti* is dispreferred, but in a way that is not so surprising upon inspection. The issue has to do with the relationship between the cause and the result. In (77), the cause and result are temporally and phenomenologically close. When the cause and the effect are not so close, *pasti* may still be used, but a lower instance of *akan* as well.

(78)   a.   ?Kalau dia   memukul dahinya,   dia   akan mengatakan
            if   s/he hit   forehead-det s/he akan say
            sesuatu   yang penting   kepadamu.
            something rel   important to-you.
            'If she hits her forehead, she will tell you something important.'
            (cause)

       b.   #Kalau dia memukul dahinya, dia pasti akan mengatakan sesu-
            atu yang penting kepadamu.

       c.   Kalau dia memukul dahinya, dia pasti akan mengatakan sesu-
            atu yang penting kepadamu.

A speaker remarks, "*Akan* alone will somewhat work ... but *pasti akan* sounds better. To me, *pasti* alone in this case sounds awkward because it makes the two events (hitting forehead and saying something important) sound like they are simultaneous. Something like 'If he hits his forehead, he *pasti* feel pain.'"

The use of *pasti* as a wide scope future allows us to explain these judgments. Since *pasti* scopes high, the consequent of the conditional modal will be simply q in (78b). Thus the temporal-phenomenological distance between the p-eventuality and the q-eventuality will be closer than it would be in (78c), which presumably has *akan q* in the consequent of the conditional modal.[24]

The evidence given above suggests that wide scope G-futures exist. The discussion underlines the idea that in any one context, the judgments can be very similar between two futures that are aspectually different. In order to determine what is going on, it is important to look at more than one language, ideally a great many more, and see what the possible morphological splits are. This is standard practice, but it is all the more important in domains where the meaning differences are so subtle.

5.2   Narrow scope A-futures

If there is such a thing as a narrow scope A-future conditional, it should be non-contingent but anyway-conflicting in conditionals because of slightly less stingy branching. Thus we did not expect to find A-futures in relevance

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[24]We can observe a parallel situation in English conditionals that lack futures. While the conditionals in (i) and (ii) lack the higher epistemic G-future, the relation between cause and effect is similar, and (ii) tends to sound as though the events are simultaneous.
   (i) If the vase falls, it breaks.
   (ii) If she hits her forehead with her hand, she tells you something important.

conditionals or indication conditionals at all, and in fact that seems to have been the case in the section where that was discussed. But we would expect to find non-contingent, anyway-conflicting *will* sentences, just not in conditionals.

Promises seem to fit the bill. In an appropriate context, the sentences in (79) could be promises. Promises are very similar to offers, in that they presuppose the speaker's ability to make sure a q-eventuality happens. For example, the speaker of (79a) presupposes that all else being equal, he will be able to make the phone call happen; likewise the speaker of (79b) presupposes that she will be able to ensure that her son will help the hearer.

(79) a. I'll give you a call.
      b. My son will help you.

Promises differ from offers in that they are not contingent on the hearer's desires, seemingly because the possibility that the hearer would not want a q-eventuality is not admitted; i.e., there are no p-worlds under consideration. Thus promises exemplify the narrow scope A-future cases we were seeking.

Before moving on I would like to take a brief look at other narrow scope A-futures that raise some interesting questions about the meaning of FUT. Recall the earlier discussion of the examples in (80), to which I promised to return.

(80) a. #Look, it'll rain.
      b. Look, it's going to rain.

Given that the example in (80a) is infelicitous,[25] it has to be infelicitous on both the G-future reading and the A-future reading. The context apparently ruled out the G-future reading, but we had no way to explain why the A-future reading might be ruled out. But this infelicity seems to be a quite general phenomenon. For instance, the example in (81a) is infelicitous in a context where the speaker rises from the couch and utters it out of the blue. (81b), on the other hand, is fine in such a context, just like (80b).

(81) a. #I'll take a bath.
      b. I'm going to take a bath.

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[25]For some but not all of my Indonesian speakers, (80a) is not infelicitous; we should not be surprised to find such a difference, given that Indonesian has a certain amount of regional variation.

There are a number of ways to improve the examples in (81a) and (80a). One way is to make them wide scope by adding a restriction, either overtly or as in (82), in the discourse.

(82) a. What will you do if you get all covered in mud?
   b. I'll take a bath.

 Another way to improve narrow scope A-futures is to preface them with *maybe*. It is perfectly acceptable to look at the rainclouds and utter (83a), or to rise from the couch and utter (83b).

(83) a. Maybe it'll rain.
   b. Maybe I'll take a bath.

Interestingly, although we might expect *maybe* to be an epistemic possibility modal, these examples do not have the meaning of an epistemic possibility modal stacked on top of *will* (where *will* has either an inertial or a bouletic ordering source).[26] Such a meaning can be expressed, with (84a), for example. The sentence in (84) says that as far as I know, it's a possibility that rain is in the works. And (84b) seems to import a lack of perfect knowledge about one's own intentions.

(84) a. Maybe it's going to rain.
   b. Maybe I'm going to take a bath.

In Indonesian the judgments are similar; in addition, it is clear that A-future *akan* is good, while G-future *pasti* is again strange.

(85) a. Mungkin aku akan tidur siang sebentar.
     maybe I A-fut sleep afternoon a-while
     'Maybe I'll take a nap.'
   b. #Mungkin aku pasti tidur siang sebentar.
     "*Pasti* is impossible."
   c. #Mungkin aku mau tidur siang sebentar.
     "*Mau* is either redundant or silly."

The examples in (83), however, are different. Rather than being an epistemic

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[26](83a) has only an inertial reading; the bouletic reading is out unless someone is able to make it rain. (83b) has both an inertial reading and a bouletic reading, though the former is heavily dispreferred. Usually one does not follow up *Maybe I'll take a bath* with *That's just the sort of thing I might do.*

modal on its own, *maybe* there seems to be providing no additional modal force.

A third context in which narrow scope A-futures improve is in a list, as in (86).

(86)   First I'll take a bath, then I'll get dressed, and then I'll eat breakfast.

What these fixes have in common is the idea that something else is required to (perhaps) bind some variable in the *will* clause. Apparently in the A-futures, FUT is not doing it by itself. On the other hand, in the futures with aspect, the P- and G-futures, something *is* doing it. Perhaps this something is aspect, and the A-futures thus have to get it from something else. But somehow this something else is not required in promising contexts. I will have to leave this question open for the moment.

6   Conclusions

I have presented evidence that futures such as *will* and *be going to* have aspectual components to their meaning. These aspectual components interact with future modality by modifying the temporal argument to the modal's accessibility relation. This has the effect of altering the set of worlds over which the modal quantifies, which can be detected through the presence or absence of the "anyway entailment" – the entailment that all not-p worlds are q worlds. These modal differences support a theory in which there are three different aspectual variations, and two different scope positions for futures in conditionals. The presence of aspect on modals therefore provides us with a new tool with which to investigate the logical form of conditionals.

One other result that arises is a correlation between presence or absence of anyway entailment (which itself depends on scope and aspect) and the choice of modal base for the future modal. For instance, we saw above that G-futures and P-futures are allowed an epistemic modal base, while A-futures are not. This corresponds to the fact that G-futures and P-futures are anyway-entailing when in narrow scope, and in wide scope, they are used to assert that the entire conditional is true (anyway) in all the epistemically accessible worlds under consideration. We may indeed expect that epistemic modality requires the anyway entailment; when one knows a fact, that fact is true anyway, even if one didn't know it. The same may be said for the modality inherent in relevance conditionals: Whether something is relevant or not is not a condition on whether it is true or not. Inertial modality,

on the other hand, in so far as it has to do with causality, must reject the anyway entailment. And in the bouletic examples, there is no particular requirement for or against the anyway entailment. This fact seems related to the idea that one can report intentions either on the spur of the moment, as they happen, or as longer-standing intentions.

Finally, it is worth pointing out that the explanations explored here absolutely require a modal analysis of *will* and *be going to*. Central to the explanation of the data is the idea that a higher aspect affects the temporal argument of the modal's accessibility relation, If instead we were to begin from a tense analysis of these futures (see Hornstein (1990), Condoravdi (2001) for discussion of such an analysis in comparison with modal analyses), it is difficult to see how the facts presented here could be explained at all.

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