

A Tentative View of Future Expressions

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1. Introduction

Rather than substantially analyzing previous views of the future expressions *will* and *be going to* in English, this paper will present a tentative view on them after reviewing a recent theory by Copley (2009). As a traditional topic of *will*, we have been concerned with what the semantics of *will* should be like. There have been roughly two views: one takes *will* to be homonymous between a modal and a periphrastic future tense, while some argue that its futurity is derived from its modality (cf. Sarkar 1998). Recently the latter view seems to be more prevalent. Matthewson (2007), for instance, argues that *will*, more precisely, *woll* in Abush's (1985) term, is a modal or a temporal ordering predicate, involving quantification over possible worlds rather than being purely temporal in nature.

Among those who consider *will* to have a modal component it is assumed that *will* is composed of *woll*, the modal part of *will*, and Present. Copley (2009) is very intriguing in merging times and worlds and interacting them in the model system. As for the treatment of modals, Copley's theory is principally based upon Kratzer's in that modals are quantifiers over worlds. Before entering into the analysis of Copley, let us briefly introduce two components in Kratzer that determine the set of worlds in which a modal is evaluated.

2. The Truth Conditional Theory of Modals (Kratzer 1991)

Kratzer (1991) assumes that modals are quantifiers over worlds. As is generally the case with quantifiers, they quantify over a contextually 'restricted' set of elements. Thus, which set of words the modal quantifies over should be contextually determined. Kratzer takes in two components that determine the set of worlds in any particular case: the modal base and the ordering source.

It holds widely that one modal can have different meanings. The sentence (1), for instance, receives two interpretations, as shown in the following sentences.

(1) Max must be leaving.

- (2) a. In view of what is known, Max must be leaving.
 b. In view of what their obligations are, Max must be leaving.

The context-supplied function, called conversational background, determines the set of worlds which are accessible from the evaluation world. Depending on a specific conversational background, the modal gives birth to different types of readings. The interpretation in (2a) invokes epistemic conversational backgrounds, while that in (2b), deontic conversational backgrounds. When the function, the value of which is provided by 'context' is fed the evaluation world as argument, it yields a set of worlds. Further, when these propositions are intersected together, it yields a set of worlds. The resulting set of worlds, also called the modal base, provides the 'restricted set' of worlds that the modal quantifies over. According to Kratzer (1991) the semantics of *must* is as follows:

- (3) $[[\text{must } \phi]]^{c,i} = 1$ iff $\forall w' \in f_c(i): [[\phi]]^{c,\langle w',t' \rangle} = 1$.

Note that *c* is the context of utterance and *i* is an index of evaluation consisting of a pair of an evaluation world *w'* and an evaluation time *t'*; f_c is a function supplied from the context assigning to the evaluation world and the evaluation time a set of accessible worlds. The modal base is thought of as the worlds in which all the propositions in the conversation background are true. In a nutshell, these are accessible worlds from the evaluation world and time with a particular conversational background, and the conversation background is said to provide an accessibility relation.

According to Kratzer, a modal base alone is not sufficient to account for all kinds of modality. She assumes that conversational backgrounds can also act as ordering sources to provide partitions of the accessible worlds into different sets, with the sets ranked as to how good they are with an ideal. Let us consider the following examples provided by Kratzer (1991):

- (4) a. There are no murders.
 b. If there is a murder, the murderer goes to jail.

According to Kratzer, propositions are sets of worlds, and a conversational background is a set of sets of worlds. When we consider a modal base (the intersection of sets of worlds) built from the conversational background in (4), there are only worlds in which (4a) and (4b) are both true. If it was the case, a conflict would occur. The set of propositions in (4) consists of an ideal state of affairs (4a) and a law-like statement (4b). For instance, a sentence like *John must not kill Mary* means that John does not kill Mary in all the ideal worlds---the set of worlds in which there are no murderers. But note that the proposition in (4b) is not appropriate in yielding the ideal set of worlds. Put differently, the proposition in (4a) would be sufficient for the set of worlds in which the modal in *John must not kill Mary* is evaluated. On the other hand, a sentence like *John must go to jail* would be intuitively perfect if (4b) was the only proposition in the modal base. Thus, Kratzer proposes to provide the best worlds quantified over via ordering sources. If there are no murderers, then the best worlds are all the ideal worlds where no murder occurs. The modal over this set entails that the denotation of *John must not kill Mary* is true. In contrast, if John kills Mary in the actual world, the modal must be evaluated in the set of worlds where a proposition expressing a law or punishment as in (4b) is true. Thus, partitioning accessible worlds into different sets is considered an ideal strategy to make the best possible worlds.

3. Copley (2009)

In Kratzer's (1991) theory a conversation background provides a modal base, a set of worlds compatible with an evaluation world w and time t . The modal base plays the role as a restrictor for a modal quantifier and the nuclear scope is the set of worlds on which the proposition is true. Following up on Kratzer's truth conditional semantics, Copley claims that the modal should be relativized to a temporal interval, and that it should be interacted with aspectual properties and the set of worlds quantified over. As argued later, *be going to* has a progressive operator in a position higher than the universal modal operator, while *will* have no such an aspectual operator.

According to Copley, futures have a direct presupposition, indicating that something is under the guidance of a director d . This could be roughly

paraphrased as follows: d directs p in w at t iff if d wants p to happen, then it will (and if not, it won't). The denotation of future modal *will* is defined as follows:

- (5) $All_b(d)(q)(w)(t)$ presupposes: d directs q in w at t ;
 if defined, $All_b(d)(q)(w)(t) = 1$
 iff $[\forall w': w' \in META-COMM(x, w, t)]$
 $(FUT(q, w', t))$

The function All_b is responsible for the universally quantified, bouletic ordered modal meaning of futures (and futurates). The abbreviation META-COMA is the conversational background to take an evaluation world w and time t to return a set of worlds metaphysically accessible from w and t and consistent with d 's commitments in w at t . It is said to denote a compositional accessible relation, which provides the intersection of the sets of worlds, as shown in (8). META and COMM are defined respectively as follows:

- (6) $META(w, t) = \{w': w' \text{ obeys the law in } w \text{ at } t\}$
 (7) $COMMIT(w, t) = \{w': w' \text{ does not violate } x \text{'s commitments in } w \text{ at } t\}$
 (8) $META-COMM(x, w, t) = META(w, t) \cap COMMIT(x, w, t)$

The future tense stems from the function FUT, which is denoted in (9). It takes an evaluation time t as its input to return a future output t' as its output.

- (9) $FUT(p, w, t) = [\exists t': t' > t] (p(w)(t'))$

In addition to the All_b modal, Copley assumes that *be going to* has an aspectual operator $SOME_t$, based on a version of the Bennett and Partee progressive (1978). The denotation is as follows:

- (10) $SOME_t(p)(w)(t) = q$ iff $\exists t' \supset t: [p(w)(t')]$

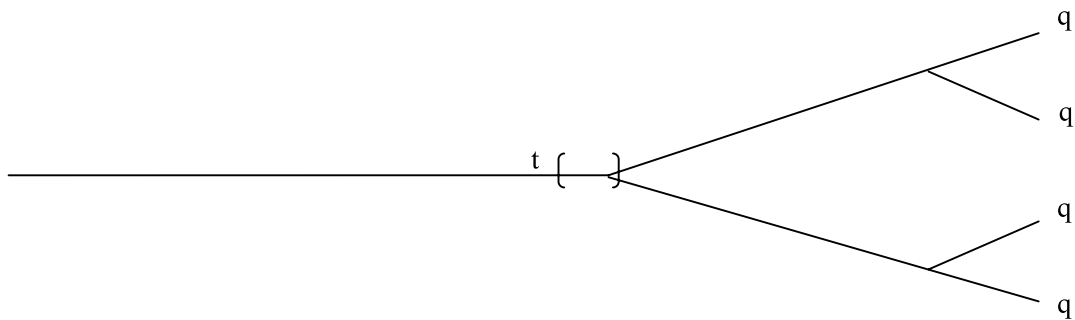
The resulting denotation of *be going to* has the progressive operator $SOME_t$ plus the universal modal All_b , lower in the structure. $SOME_t$, evaluated at t, w , and p , yields a truth value iff p holds at a superinterval of t, t' --- t is an internal interval of t' . To make it simpler, I represent the following denotation in which the higher aspectual operator is replaced with a familiar existential operator over temporal intervals:

- (11) $\exists t' \supset t [All_b(d)(q)(w)(t')] =$

1 iff $\exists t' \supset t [\forall w': w' \in \text{META-COMM}(x,w,t')] (\text{FUT}(q,w't'))$

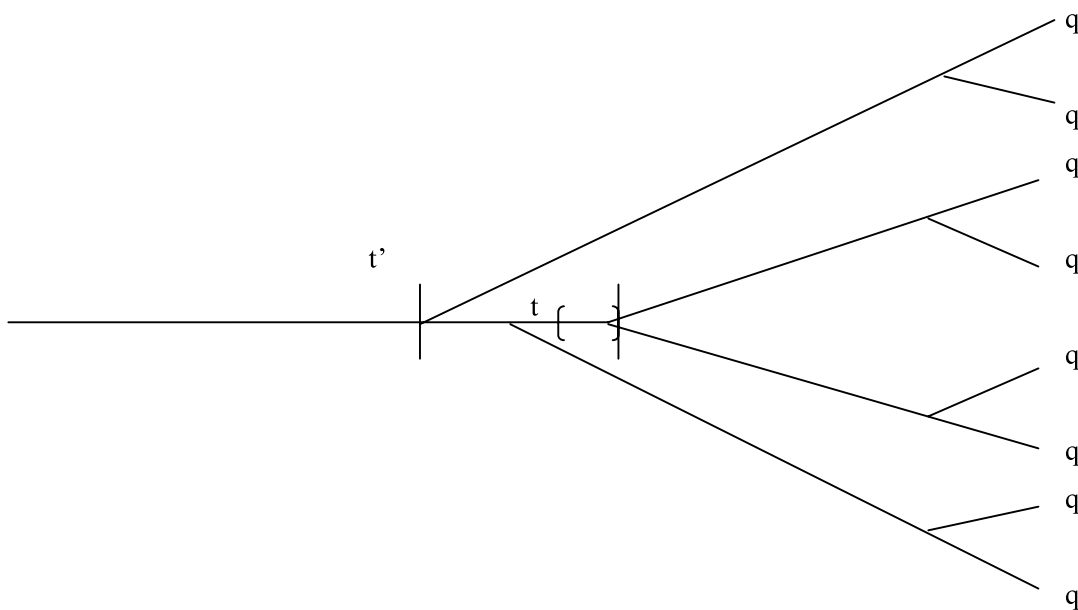
Unlike *be going to* future, *will* lacks such an aspectual operator. In a nutshell, the substantial difference between the two futures is an aspectual difference, shown in (5) and (11). The set of worlds *will* quantifies over is simply the one at the interval t when d directs in w . On the other hand, *be going to* is a sentential operator over a larger set of worlds than *will*. Note that the temporal argument of ALL_b is not t but rather some larger interval t' . In other words, the worlds quantified over are those that are maximally consistent with what the director wants at the interval t' . The differences between the two sets are

- (12) A case where $\text{ALL}_b(d)(q)(w)(t)$ is true
(bare future reading of *will*)



(Copley 2009: 82)

- (13) A case where $\text{SOME}_t(\text{ALL}_b(d)(q)(w)(t))$ is true
(progressive future, *be going to*)



(*ibid.*:83)

4. Present Temporal Input

As for the aspectual properties of *be going to*, Copley assumes an aspectual (progressive) operator $SOME_t$ above the modal. The modal semantics of *be going to* and *will* are essentially the same, but a difference in the temporal argument as their inputs makes a substantial difference in the set of worlds quantified over.

It is also assumed, with Bennett and Partee (1978), that what is significant to the study of future constructions is the subinterval property. A predicate p of t has the subinterval property if and only if for all times t , for all subintervals t' of t , the truth of $p(t)$ entails the truth of $p(t')$. Thus a predicate of times such as $[[John\ be\ asleep]]^s(w)$ has a subinterval property, because John's being asleep over an interval t entails that that predicate is true at all subintervals of t . On the other hand, however, if $[[John\ bake\ a\ cake]]^s(w)$ is true of an interval t , it does not entail that it is true of all the subintervals of t . What sort of predicate can have the subinterval property? Note here that eventive predicates such as *build* and *arrive* cannot be predicated of the present, as shown below:

- (14) John builds a cottage \neq John is building a cottage.

On the other hand, stative predicates and derived statives including progressives and generics can be predicted of the present.

- (15) a. John is asleep.
b. John is building a cottage.
c. John builds a cottage every two weeks.

To verify the predicates with the subinterval property, Copley counts on the diagnosis of whether they are fine with the present. This is presented as Present –SIP constraint--SIP is an abbreviation of “subinterval property”.

- (16) Present –SIP constraint
For –SIP predicates of times P ,
 $P(now)$ is undefined.

The predicates in (15) are all fine in the present, but they could be satisfied at the “superinterval” containing the present as well.

With the discussion so far in mind, let us proceed to the future expressions. Copley argues that $SOME_t$ makes a future expression a +SIP predicate that is expected to occur with a *now* input. As seen from the denotations

above in (5) and (11), it is expected that the progressive future should be +SIP by virtue of having $SOME_t$. Unlike the progressive future, *will* does not bear such an operator, thus lacking the subinterval property: i.e., –SIP.

Imagine a situation: clouds are gathering and rain is imminent. In a situation like this we can use the progressive future as in (17a) but not (17b).

- (17) a. Oh look, it's going to rain.
b. #Oh look, it'll rain.

Occurring at the present input t (the present interval input) entails that the predicate should be satisfied at the superinterval t' where $t' \supset t$. $[[It's\ going\ to\ rain]]^s(w)$ is not only true of the interval t , but of the superinterval t' . The prediction for raining is already available at the present time: clouds were gathering and the change of the sky was observed.²

Similarly, *Guess what*, which makes a present input context, does not allow a future *will* to follow, while *be going to* is fine.

- (18) a. Guess what? #We'll get married!
b. Guess what? We're going to get married!

Oddly (18a) sounds like the speaker was determined to get married at the speech time. It is odd enough. On the other hand, (18b), which is perfectly fine, entails that the speaker (director) has made up his mind before the speech time. $[[We're\ going\ to\ get\ married]]^s(w)$ is true at the interval t' containing t . These show that the progressive future *be going to* permits a present input, but *will* does not. This difference is ascribed to the presence(or absence) of the aspectual operator $SOME_t$.

5. Future Tense

Finally I will wrap up the paper by presenting my skeptical view on *will* as the future tense. Recall that Copley assumes that the future tense stems from the function FUT, which is denoted in (19). It takes an evaluation time t as its input to return a future output t' as its output.

- (19) $FUT(p,w,t) = [\exists t':t'>t](p(w)(t'))$

But the future operator FUT should be optional in that *will* is not uniquely used to refer to future time. Note that *will* is used as a modal with reference to a present or past

time as well as a future time.

- (20) a. It will rain in Fukuoka tomorrow morning due to an approaching low pressure.
 b. Mary will arrive the day after tomorrow.
 c. Mary will have stayed by nine o'clock tonight.
- (21) a. John will be the postman.
 b. Tell him Professor Cressage is involved---he will know Professor Cressage. (Palmer1979)
 c. In the 1920s Wilkinson Sword introduced the stoppable razor and then the 'Empire' range which many people will remember. (Palmer 1979)
 d. He will have finished his assignment yesterday.

Palmer (1979) gives an exhaustive list of contexts in which *will* can be used. But here let us focus only on the time references of *will*. Here arises a question: does *will* inherently bear the future? Semantically must the function FUT be invoked to derive a future time? Given a unified approach of the semantics of *will*, however, it is ad hoc to optionally posit the function in accordance with the temporal context. Rather I suggest that the temporal interpretation of a given sentence depends on the interaction between the semantics of *will* and the sentence's aktionsart. I cannot commit to an extensive discussion here but will bring forth the view that the futurity of *will* derives from the sentence's aktionsart and pragmatic considerations.

Note that the examples in (20) have eventive components (an achievement, according to Vendler's (1967) classification) while those in (21) have stative ones. (21d) is a derived stative though the verb itself is an achievement. The present perfect entails the property of being the state of him finishing his assignment. Though (20c) and (21d) are both present perfectives, their temporal distinction is attributed to their temporal contexts, which have been made explicit by temporal adverbs such as *nine o'clock tonight* and *yesterday*. As suggested in Dowty (1986) and Gennari (2004), the reference time of a sentence is given either by adverbs that temporally locate the sentence or by the event time of the previous sentence in discourse. The temporal reference in these examples is pragmatically determined because of the temporal adverbs.

Then is the function of FUT derived from *will*'s

modality? For an exploration of a possible answer, let us carry on our discussion with the following simple sentences.

- (22) John will be at home (now/ tomorrow).
 (23) John will receive a letter (tomorrow).

(22) can have a future or an overlapping interpretation relative to the speech time, as each of possible temporal adverbs indicates. It means that whether the set of worlds quantified over should be assumed in the present time or a future time has to be based on the temporal adverbs. On the other hand, the eventive predicate in (23) only has a future reading, not the present reading (the overlapping reading with the speech time). As a logical entailment of eventive verbs, the set of worlds for quantification compatible with the speech time are the one that could happen later than the speech time. This indicates that the possible temporal locations of the sentences in question depend on aktionsart, but not on modality.

As for stative predicates, if a sentence Q is true at an interval *t*, then it is also true at a subinterval *t'*. Recall that this subinterval property was discussed with –SIP constraint in Section 4. Associating the property of +SIP with the SOME_t operator, Coley claims that *be going to* has the SOME_t operator whereas *will* lacks such an operator. But the discussion of the subinterval property is not only limited to the modal property, but to stative predicates in general. When *will* combines with a stative verb, the resultant predicates must reflect its subinterval property. Thus by assuming that stative predicates including derived ones are associated with the 'exist' operator (Genarri 2004), I demonstrate that the sentence (22) is available for both present and future temporal references. Ignoring the condition of presupposition (Copley 2009), I will represent the truth condition of (22) as in (24), which captures the 'part-of' property of temporal intervals by introducing a situation argument. On the other hand, the eventive predicate lacking the subinterval property does not bear such an operator, as shown in (25).

- (24) a. $\forall w'[w' \in \text{META-COMM}(x, w, t)] [\exists s[\text{exist}(t, s) \wedge \text{be_at_home}'(w')(s)(j) \wedge \text{now} \subseteq s]]$
 b. $\forall w'[w' \in \text{META-COMM}(x, w, t)] [\exists t'[t < t' \wedge \exists s[\text{exist}(t', s) \wedge \text{be_at_home}'(w')(s)(j) \wedge \text{tomorrow} \subseteq s]]$
 (25) $\forall w'[w' \in \text{META-COMM}(x, w, t)] [\exists t'[t$

$\langle t' \wedge \text{receive_a_letter}'(w')(t')(j) \wedge t' \subset \text{tomorrow} \rangle$

I assume, with Gennari (2004), that the ‘exist’ operator is a function to take a temporal interval and the situation including it to return the truth value. The situation variable introduced there may be included in a future reference time or present reference time—it is of course pragmatically determined. Further, suppose that the introduction of an existential operator over a temporal variable t' is not inherent in the modal *will*, but due to a temporal adverb or the discourse context. If this is the case, we will say for certain that *will*'s futurity stems from the interaction with the predicate's aktionsart and pragmatic considerations. As for eventive verbs like *receive*, their inherent property of lacking a present temporal input guarantees its future reference. The set of worlds compatible with the evaluation time entails the set of worlds assumed in a future period.

7. Final Remarks

In this paper I reviewed a recent theory of Copley (2009) and then presented my view of the future expressions *will* and *be going to*. Copley's theory merges times and worlds well into the modal system, saying that their aspectual properties make a substantial difference between the two future expressions. This paper has also discussed a view on futurity of *will*. I presented the view to treat *will* as conveying only modal information. As I mentioned in the introduction, this paper is nothing but the one to review Copley (2009) and bring forward my tentative view of *will*. In the papers to follow, I will embark on an exhaustive research for the modals.

Note

¹Copley (2009: fn. 19) suggests that the temporal output of SOME_i should be restricted to realis times. It means that t is not an initial subinterval of t' . If so, there would be no difference in the sets of worlds quantified over.

²As further pointed out by Copley (2009), when you are speaking about the way things generally are, not about the present situation, you can make a claim like (I).

(I) Don't worry, it'll rain

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