Del Prete (2012): The interpretation of indefinites in future tense sentences. A novel argument for the modality of *will*?

Semantics Tea, Feb 25, Jos Tellings, jtellings@ucla.edu

1 Preliminaries

Will The English future tense auxiliary *will* has been analyzed as purely a modal (Enç 1996), ambiguous between a modal and a tense operator, and purely a tense operator (Kissine 2008).

(1) Uses of *will* (from Kissine 2008: 130)

a. Mary will come. [future]

b. Oil will float on water. [generic]

c. Mary will be at the opera now. [epistemic]

d. In winter, Mary will always wear a green coat. [habitual/volitional]

e. You will leave tomorrow by the first train. [deontic]

Tense operators Enç (1986): Priorian tense operators don't work. Under the classical analysis, (2) has two readings ('current sophomores cried in the past', or 'past sophomores cried when they were sophomores'), missing the reading in which past sophomores cried at a past time distinct from when they were sophomores:

(2) Every sophomore cried. (Enç 1986: 414)
$\mathbf{P}\,\forall x(\mathsf{sophomore}(x) \longrightarrow \mathsf{cried}(x))$
$\forall x(\mathsf{sophomore}(x) \longrightarrow \mathbf{P}\,\mathsf{cried}(x))$

Instead, Enç (1986) argues for implementing strictly local tense operators that apply to verbs and nouns only. This allows for having two past tense operators, as is required to represent the missing third reading of (2) (one operator for each predicate).

(3) $\forall x(\mathbf{P}(\mathsf{sophomore}(x)) \longrightarrow \mathbf{P}(\mathsf{cried}(x)))$

Intensional verbs Non-specific readings, existence presuppositions, substitution of co-referential terms.

(4) a. John is looking for a friend, but no particular one.

b.# John talks to a friend, but no particular one.

(5) a. John is looking for a unicorn.

b.# John is hunting a unicorn.

(6) a. John is looking for Cicero, but not for Tully.

b.# John is reading Cicero, but not Tully.

Does future tense generate intensional contexts? Wuttich (1995): no. The substitution argument carries the tacit assumption that premises and conclusion are true at the same time.

(7)

John will meet the president.	$F(a)^{t_1}$
The president is Obama.	$b = c^{t_2}$
John will meet Obama.	$F(b)^{t_1}$

Scopal behavior of future tense:

(8) An astronaut will walk on Mars in 30 years time.
1. A current astronaut (say, John) will walk on Mars in 30 years time.
2. In 30 years time there will be an astronaut (not born yet) who will walk on Mars.
$\exists x(\mathbf{F}(\mathsf{astronaut}(x)) \wedge \mathbf{F}(\mathsf{walk\text{-}on\text{-}Mars}(x)))$

Indefinites
Wide-scope / narrow-scope indefinites? (Kratzer 1998)
Semantics or pragmatics? Fodor and Sag (1982): semantic operator for specific indefinites $\mathbf{a_r}$; Ludlow and Neale 1991: difference between quantificational, specific and referential uses is non-semantic.

2 Stalnaker's asymmetry

Stalnaker's Asymmetry: (9a) is valid, (9b) is not.

(9) a. President Carter will appoint a woman to the Supreme Court.
Therefore, there is a particular woman that the president will appoint.

b. President Carter has to appoint a woman to the Supreme Court.
Therefore, there is a particular woman that the president has to appoint.

Under the classical analysis of *have to* as a universal quantifier over deontic worlds, this can be construed as a scopal difference (DP, p. 7):

(10) a. $\exists x[\text{woman}(x, w_0) \wedge \forall w[\text{Alt}_{\text{deontic}}(w_0, w, \text{Carter}) \rightarrow \text{appoint}(\text{Carter}, x, w)]]$

b. $\forall w[\text{Alt}_{\text{deontic}}(w_0, w, \text{Carter}) \rightarrow \exists x[\text{woman}(x, w) \wedge \text{appoint}(\text{Carter}, x, w)]]$

Del Prete's argument is that therefore *will* should not introduce universal quantification over alternatives, otherwise the contrast between (9a) and (9b) disappears.

Compare:

(11) John will look for an Italian actress for his movie.
Therefore, there is a particular Italian actress that John will look for.

Modal subordination Modal subordination refers to the phenomenon that the truth of an assertion (sentence or part of sentence) is checked relative to another sentence that has modal force. In Roberts's (1989) example, the consequent of the conditional is modally subordinate to its antecedent. In particular, the truth of the conditional is determined by temporally adding to the common ground the set to those possible worlds in which John bought a book, and by checking if in all those worlds John is reading that book at home by now.

(12) a. If John bought a book$_i$, he'll be home reading it$_i$ by now. #It$_i$'s a murder mystery.

b. If John bought a book$_i$, he'll be home reading it$_i$ by now. It$_i$'ll be a murder mystery.

The general idea is that subsequent anaphoric reference requires a modal context in order to ensure that the temporarily added set of possible worlds is still available.

Del Prete uses the following examples:

(13) a. Mary will marry a rich man. He must be a banker.
1. specific indefinite / epistemic 'must'

b. Mary wants to marry a rich man. He must be a banker.
1. specific indefinite / epistemic 'must'
2. non-specific indefinite / teleological 'must'

A cases with *want*, a specific indefinite, and teleological modality:

(14) [Speaker has heard that Mary wants to marry a specific rich man. The speaker wants Mary's husband to be a banker]
I heard that Mary wants to marry a rich man. You should remind her that he must be a banker!

A case with *will* and teleological modality:

(15) When your EP comes out, I will buy a copy. It must be autographed though!

The modal *should* more naturally gives rise to teleological modality with non-specific indefinites:

(16) Mary wants to marry a rich man. He should be a banker.

(17) You will probably only buy a safe once in your life. It should therefore be the best and most secure available.

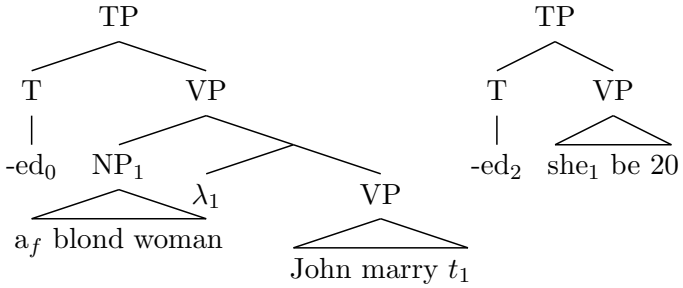
(18) a. A: John will marry an Italian.
B: Who is she?
A: ??No one in particular / ✓He doesn't know yet. She should be from Tuscany, though.

b. A: John wants to marry an Italian.
B: Who is she?
A: ✓No one in particular / ✓He doesn't know yet. She should be from Tuscany, though.

3 The formal proposal

- Branching time model on Kratzerian situations. $\leqslant_S$ is the partial ordering. A world history h is a maximal chain of situations. $h \approx_s h'$ if h and h' agree up to s (share the same past prior to s).
- Types: e (individuals), t (truth values), i (situations), s (world histories).
- Assignment functions: f assigns individuals to variables; G assigns a situation to a variable of type i relative to a history h, i.e. $G(x_i, h) \in h$.
- Semantic values are relative to a context c, assignment functions f and G, and a world w: $[\![\ ]\!]^{c,f,G,w}$. The context consists of the time of utterance c_t, and the circumstance of utterance $c_w = \{h\,|c_t \in h\}$ ('openness of the world').
- Indefinite NPs are represented by choice functions with a situation argument: $f_c(P, s) = x$ is a individual that satisfies P in s, picked out by a contextual choice function f_c.

(19) John married a blond woman. She was 20 years old.



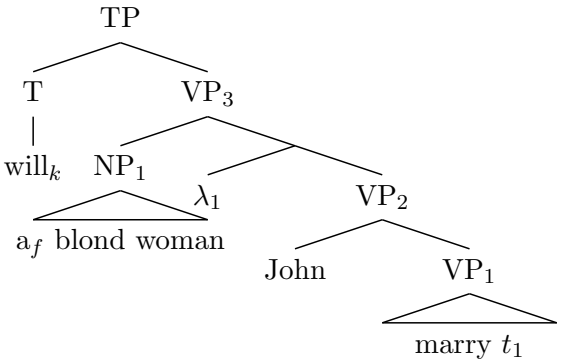
$[\![\text{a}_f \text{ blond woman}]\!] = \lambda P_{\langle i,et\rangle}\lambda s_j \exists x(f_c(\text{blond-woman}, s_i) = x \wedge P(s_j, x))$
$[\![\lambda_1[\text{John marry } t_1]]\!] = \lambda s_j.\lambda x.\ \text{marry}(s_j, \text{John}, x)$
$[\![\text{she}_1]\!] = \iota x.(f_c(\text{blond-woman}, s_i) = x)$
$[\![\text{discourse}]\!] = 1$ iff $\exists x\{s_0 <_S c_t\}[(f_c(\text{blond-woman}, s_0) = x \wedge \text{marry}(s_0, \text{John}, x))$
$\wedge(\text{20-yr-old}(s_0, (\iota x.(f_c(\text{blond-woman}, s_0) = x))))]$

Semantics for *will* *Will* has the semantics of a tense marker (no universal quantification over futures). It contains a temporal index k, which corresponds to a situation s_k.

(20) $[\![\text{will}_k]\!]^{c,G,h} = \lambda P_{\langle i,t\rangle} : (c_t \leqslant_S G(s_k, h)).P(G(s_k, h))$

Here the world parameter is fixed to a specific history h.

(21) John will marry a blond woman.



$[\![\text{VP}_3]\!]^{c,f,h} = \lambda s.\exists x[f_c(\text{blond-woman}, s) = x \wedge \text{marry}(s, \text{John}, x)]$
$[\![\text{TP}]\!]^{c,G,h} = 1$ iff $\{c_t \leqslant_S G(s_k, h)\}\exists x[f_c(\text{blond-woman}, G(s_k, h)) = x \wedge \text{marry}(G(s_k, h), \text{John}, x)]$.

Supervaluation: "in order to overcome the plurality of histories speakers resort to a supervaluational strategy requiring that the future tensed statement hold for any such history" (p. 24).

Lifting the simplification, we now calculate *will* with respect to c_w, and apply supervaluation: (p. 24)

(22) $\forall h_1[h_1 \approx_{c_t} h_0 \rightarrow \{c_t \leqslant_S G(s_k, h_1)\}\exists x[f_c(\text{blond-woman}, G(s_k, h_1)) = x \wedge \text{marry}(G(s_k, h_1), \text{John}, x)]]$.

Alternatively the choice function can be instantiated to the actual world c_w:

(23) John will marry an Italian woman. (p. 26)
$\forall h_1[h_1 \approx_{c_t} h_0 \rightarrow \{c_t \leqslant_S G(s_k, h_1)\}\exists x[f_c(\text{Italian-woman}, c_w) = x \wedge \text{marry}(G(s_k, h_1), \text{John}, x)]$

(24) John wants to marry an Italian woman. (p. 26)
$\forall w_1[\text{Alt}_{\text{bouletic}}(c_w, w_1, \text{John}) \rightarrow \exists x[f_c(\text{Italian-woman}, c_w) = x \wedge \text{marry}(w_1, \text{John}, x)]]$.

Specific indefinites now arise because of the argument of the choice function (c_w versus a bound variable).

Del Prete can now account for the contrast in (18). He assumed that *no particular one* amounts to asserting that there is no choice function which uniquely identifies the indefinite.

(25) John wants to marry an Italian, but no one in particular.
$\exists f \forall w_1[\text{Alt}_{\text{bouletic}}(c_w, w_1, \text{John}) \rightarrow \exists x[f_c(\text{Italian}, w_1) = x \wedge \text{marry}(w_1, \text{John}, x)]] \wedge$
$\neg\exists f \forall w_1[\text{Alt}_{\text{bouletic}}(c_w, w_1, \text{John}) \rightarrow \exists x[f_c(\text{Italian-woman}, c_w) = x \wedge \text{marry}(w_1, \text{John}, x)]]$.

(26)?? John will marry an Italian, but no particular one.
$\forall h_1[h_1 \approx_{c_t} h_0 \rightarrow \exists f \exists x[f(\text{Italian}, h_1) = x \wedge \text{marry}(G(s_k, h_1), \text{John}, x)] \wedge$
$\forall h_1[h_1 \approx_{c_t} h_0 \rightarrow \neg\exists f \exists x[f(\text{Italian}, c_w) = x \wedge \text{marry}(G(s_k, h_1), \text{John}, x)]$

Note: in (26) the domain condition $\{c_t \leqslant_S G(s_k, h)\}$ has been left out for simplicity (see Del Prete, fn. 31), and the situation-argument of the first choice function f is just h_1 instead of $G(s_k, h_1)$. The crucial point though is whether that argument is bound by $\forall h_1$ or a free instance of c_w.

Sentence (26) is incoherent: in every possible future h there is some way f to pick an Italian in h, yet for each possible future h there is no possible way to pick an Italian in c_w. Because of the 'openness of the world', c_w contains all possible futures of c_t.

Modal subordination In the cases of modal subordination, the modal in the second sentence quantifies over the set of historical alternatives for the universal quantification in the future tense sentence (via Supervaluation).

(27) Mary will marry a rich man. He should be a banker. (p. 30)
$\forall h_1[h_1 \approx_{c_t} h_0 \rightarrow \{c_t \leqslant_S G(s_k, h_1)\}\exists x[f(\text{rich-man}, h_1) = x \wedge \text{marry}(G(s_k, h_1), \text{Mary}, x)]] \wedge$
$\forall h_1[(h_1 \approx_{c_t} h_0 \wedge \text{Alt}_{\text{teleo}}(c_w, h_1)) \rightarrow \text{banker}(G(s_k, h_1), [\iota x][f(\text{rich-man}, h_1) = x])]$.

The modally independent reading (specific indefinite, epistemic modality):

(28) Mary will marry a rich man. He should be a banker. (p. 30)
$\forall h_1[h_1 \approx_{c_t} h_0 \rightarrow \{c_t \leqslant_S G(s_k, h_1)\}\exists x[f_c(\text{rich-man}, c_w) = x \wedge \text{marry}(G(s_k, h_1), \text{Mary}, x)]] \wedge$
$\forall w_1[\text{Alt}_{\text{epistemic}}(c_w, w_1) \rightarrow \text{banker}(w_1, [\iota x][f_c(\text{rich-man}, c_w) = x])]$.

Question: how is the modal base selected?

4 Conclusion

Questions:

- What is the nature of Supervaluation?
- "I suggest that the extent to which this mechanism is not optional matches the extent to which our talks about the future confront us with a plurality of possible outcomes. Since we have assumed that the default situation in human conversations has the context leaving it undetermined what future will become actual, our expectation is that a universal quantification over histories will be triggered whenever a linguistic expression is used in such conversations to refer to some future eventuality" (p. 32).
- Many modalities involve future; why don't we apply supervaluation over bouletic alternatives? Compare:

  (29) President Carter has to appoint a woman to the Supreme Court.
  [Since President Carter always fulfills his obligations, he *will* appoint a woman to the Supreme Court]
  Therefore, there is a particular woman that the president will appoint.

- No wide-scope indefinites, specific indefinites have a c_w argument in their choice function. What does it mean to existentially quantify choice functions?
- Other modal flavors of *will*?

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