

Tense under Attitudes. Part II.

1. Analysis of present embedded under past for SOT: English

(1) Behaviour of SOT- and non-SOT languages under [matrix past tense](#): [From previous h/o]

	SOT lgs	Non-SOT lgs
Embedded past tense	Ambiguous: PAST-wrt-t or vacuous	Unambiguous: PAST-wrt-t
Embedded present (and future) tense	Indexical, i.e. necessarily anchored to speech s^* (double access reading): PRES-wrt- s^*	Not indexical, but bound by matrix t : PRES-wrt- t

■ Present embedded under past:

For many speakers, the sentences in (2)-(3) are deviant. But, for those speakers that find them acceptable, the present tense in the complement clause receives a particular interpretation: the event described in the complement clause must hold both at the "subjective now" and at the speech time s^* ("double access").

(2) **John said that Mary is pregnant.**

(3) **The ultrasound picture indicated that Mary is healthy.**

⇒ Abusch (1994): *De re* attitude about the present time

⇒ Ogihara (1996): *De re* attitude about a present state. Here we will follow this approach, implementing it as close as possible to Kratzer (1998).

■ Adding the *res* argument to attitude verbs:

(4) Last entry for **believe** from previous handout, type $\langle s, \langle \langle s, it \rangle, \langle i, et \rangle \rangle \rangle$

$[[\text{believe}]]^g = \lambda w. \lambda P_{s(it)}. \lambda t. \lambda y. (\forall w') (\forall t') [(w', t') \text{ is compatible with everything } y \text{ believes of } (w, t) \text{ in } w \text{ at time } t \rightarrow P(w')(t')]$

(5) **believe**, type $\langle s, \langle \langle s, \langle i, vt \rangle \rangle, \langle i, \langle v, et \rangle \rangle \rangle \rangle$

$[[\text{believe}]]^g = \lambda w. \lambda P_{s(i(vt))}. \lambda t. \lambda s. \lambda y. y \text{ is acquainted with state } s \text{ in } w \text{ at } t, \text{ and } (\forall w') (\forall t') (\forall s') [(w', t', s') \text{ is compatible with everything } y \text{ believes of } (w, t, s) \text{ in } w \text{ at time } t \rightarrow P(w')(t')(s') = 1]$

(6) **John believes that it is raining.**

John is acquainted with state s in w at t , and

$(\forall w') (\forall t') (\forall s') [(w', t', s') \text{ is compatible with everything } y \text{ believes of } (w, t, s) \text{ in } w \text{ at time } t \rightarrow [[\text{it is raining}]]^g (w')(t')(s') = 1]$, where

$[[\text{it is raining}]]^g = \lambda w. \lambda t. \lambda s. s$ is a eventuality/state of it raining and s takes places in w at t

■ Assumptions about English complement clauses:

- (7) i. **PRO** has to be moved for type reasons and thus creates a temporal abstract.
 ii. The semantic tense of a complement in past tense is either just **PRO** (leaving the embedded past tense uninterpreted) or **P(PRO)** (interpreting the embedded past tense). We can leave past tense uninterpreted only if we can form a binding chain from some interpreted past tense to the uninterpreted embedded past tense.
 iii. The semantic tense of a complement in present tense is either just **PRO** (leaving the embedded present tense uninterpreted) or **the speech time s*** (interpreting the embedded present tense with its regular deictic meaning). As in the case of embedded past, we can leave present tense uninterpreted only if we can form a binding chain [or something alike] from some interpreted present tense to the uninterpreted embedded present tense.

■ Possibility 1: embedded present tense as s*

- (8) **John said that Mary is pregnant.**

P N λ_1 John said(t₁)(s) [N λ_3 Mary is-pregnant(t₃)]

= $\lambda w. (\exists t_1 < s^*)$ John is acquainted with state s in w at t₁, and $(\forall w')(\forall t')(\forall s')$
 $[(w', t', s')$ is compatible with everything y says of (w, t, s) in w at time t \rightarrow
 $\llbracket \text{N } \lambda_3 \text{ Mary is-pregnant}(t_3) \rrbracket^s (w')(t')(s') = 1]$,
 $\llbracket \lambda_3 \text{ Mary is-pregnant}(t_3) \rrbracket^s = \lambda w''. \lambda t_3. \lambda s''$. s'' is a eventuality/state of Mary
 being pregnant and s'' takes places in w'' at t₃

QUESTION 1: What is the problem with (8)?

■ Possibility 2, only available for some speakers: **PRO** and sort-of a binding chain

- (9) "Suppose now that for those speakers who are comfortable with the present under past cases, the present tense can take [MR: the time of] the implicit *res* argument as its antecedent, an option that is bound to be marginal." (Kratzer 1998)
 (10) Idea: Suppose the *res* argument is a present state, that is, s happens at s*. Something like a binding chain is created between the time of the *res* s and the embedded present tense. This allows to leave the embedded present tense uninterpreted and insert **PRO**.

- (11) **John said that Mary is pregnant.**

P N λ_1 John said(t₁)(s) [**PRO λ_2 t₂ λ_3 is-pregnant(t₃)]**

iPr uPr uPr

= $\lambda w. (\exists t_1 < s^*)$ John is acquainted in w at t₁ with a present state s, and
 $(\forall w')(\forall t')(\forall s')$ [(w', t', s') is compatible with everything y says of (w, t, s) in w at
 time t \rightarrow
 $\llbracket \text{PRO } \lambda_2 \text{ t}_2 \lambda_3 \text{ Mary is-pregnant}(t_3) \rrbracket^s (w')(t')(s') = 1]$,

- \Leftrightarrow The *res* state s takes place at the speech time s*.
 \Leftrightarrow The *res* state s must also hold during the saying time t₁ (and at the "subjective now"), since John is acquainted with s already at t₁.
 \Leftrightarrow The speech time s* is, thus, constructed as a long interval of time including both the moment when the speech act is performed and t₁.

2. Empirical generalizations about tenses embedded under matrix present

(12) Behaviour of SOT- and non-SOT languages under **matrix present tense**:

	SOT lgs	Non-SOT lgs
Embedded past tense	Unambiguous: PAST-wrt-t	Unambiguous: PAST-wrt-t
Embedded present (and future) tense	Simultaneous to matrix t: PRES-wrt-t OR Indexical (double access): PRES-wrt-s*	Not indexical, but simultaneous to matrix t: PRES-wrt-t

Recall that **will** is a present tense form.

(13) John will say that Mary left.

(14) John will say that Mary is pregnant.

3. Analysis of past embedded under present for SOT languages: English

■ Embedded past tense as **PRO**:

(15) **John will say that Mary left.**
 $N \lambda_1 \text{will}(t_1) \lambda_2 \text{John say}(t_2) [\text{PRO} \lambda_4 t_4 \lambda_5 \text{Mary left}(t_5)]$

QUESTION 2: Given the assumptions in (7), what goes wrong with (15)?

■ Embedded past tense as **P(PRO)**:

(16) **John will say that Mary left.**
 $N \lambda_1 \text{will}(t_1) \lambda_2 \text{John say}(t_2) [\text{PRO} \lambda_4 P(t_4) \lambda_5 \text{Mary left}(t_5)]$
 $= \lambda w. (\exists t_1 > s^*) ((\forall w', t_2) \in \text{DOX}_{\text{John}}(w, t_1)) (\exists t_5 < t_2) \text{Mary leaves in } w' \text{ at } t_5$

4. Analysis of present embedded under present for SOT languages: English

■ Indexical (double access) reading: As in section 1.

■ Simultaneous reading:

(17) **John will say (within 3 years) that Mary is pregnant (then).**
 $N \lambda_1 \text{will}(t_1) \lambda_2 \text{John say}(t_2) [\text{PRO} \lambda_4 t_4 \lambda_5 \text{is-pregnant}(t_5)]$

QUESTION 3: Can we form a licit binding chain here and leave the embedded present tense uninterpreted? If so, write down the resulting truth conditions.