

A Semantic Theory of Partial Control

Overview: We give an analysis of partial control (PC) that provides a principled account in terms of semantic properties of what determines whether a given control predicate permits partial control.

Background: A puzzle in the study of control concerns the participation of some control predicates in configurations where the controller is a proper subset of the plurality given by the understood subject [1]:

1a. John intended to assemble in the hall.

1b. John remembered assembling in the hall.

1c. John was glad to assemble in the hall.

A first step to understanding this phenomenon is to identify the properties distinguishing the control predicates that permit PC (the PC class) from those that only permit exhaustive control (the EC class, (2)).

2. *John tried/managed/deserved/claimed/pretended to assemble in the hall.

Proposal: Two semantic properties are jointly necessary and sufficient to diagnose membership of a given control predicate in the PC class: (I) the predicate must be a ‘canonical’ attitude predicate; (II) the semantics of the control predicate must involve temporal containment. After elaborating on I and II we provide a semantics that sheds light on their roles in determining the availability of partial control.

Property I: The PC predicates in (1) - and in fact all PC predicates - are attitude predicates: verbs of mental attitude or *verba dicendi*. However, not all attitude predicates are PC predicates: *try*, *manage*, *claim* and *pretend* are not (2), while in languages where *believe* is a control predicate it does not tolerate PC (3).

3. *Gianni crede di vivere insieme
John believe COMPL live together
Intended: ‘John_i believes that they_{i+} live together.’

The exclusion of *try* and *manage* from the PC class is explained by assuming that they are non-canonical attitude predicates, following recent work on *try* [2, 3]. These predicates do not behave like canonical attitude predicates with respect to intensional properties:

4a. John intended/claimed/pretended to ride a unicorn to work every day.

4b. #John tried/managed to ride a unicorn to work every day.

In (4), the non-canonical attitude predicates carry existence entailments, while the canonical ones do not.

These facts can be handled by extending Grano’s semantics for *try* to all non-canonical attitude predicates.

According to this view, what distinguishes this class from canonical attitude predicates is that the latter are quantifiers over centred worlds (world-time-individual triples), but non-canonical attitude predicates are not.

Property II: *Claim*, *pretend* and *believe* are canonical attitude predicates, but their semantics doesn’t involve temporal containment. This differentiates them from PC predicates, which are either (i) future-oriented (*intend*, *want*, *expect*), (ii) past-oriented, (*remember*, *regret*) or (iii) have a progressive-like meaning (*glad*, *like*, *hate*).

The future-oriented nature of *intend*, *want* and *expect* is witnessed by the availability of future temporal modifiers in their complement clause even when the matrix clause contains a present temporal modifier [1]:

5. Today John hopes/wants/expects to go to the movies tomorrow.

The analogous test with past temporal modifiers attests to the past-oriented nature of *remember* and *regret* [1]:

6. Today John remembers/regrets going to the movies yesterday.

The progressive component of the meaning of emotive factives like *glad* is revealed by their ability to take a complement clause involving an accomplishment predicate:

7. John was glad/would be glad to write a letter to Mary.

Glad differs from *believe* and *claim* in this respect:

8a. John believes Bill to write a letter to Mary *(every weekend).

8b. John claims to write a letter to Mary *(every weekend).

The degraded status of (8) is due to *believe* and *claim* being stative predicates. (We set aside *pretend*, which denotes an activity.) As such, they have the subinterval property:

9. A tenseless sentence ϕ has the subinterval property iff the truth of ϕ with regard to some interval t guarantees the truth of ϕ with regard to all the subintervals of t . [Ogihara 2007[4]: 399, ex 17]

By (9), if at t John’s belief state locates him at a time at which Bill writes a letter to Mary, then any subinterval t' of t is such that at t' John’s belief state locates himself at a time at which Bill writes a letter to Mary. But this attributes an incoherent mental state to John, given the definition of accomplishments:

10. ϕ is an accomplishment only if the truth of ϕ at t guarantees the falsity of ϕ at all proper subintervals of t .
[Ogihara 2007[4]: 401, ex 20]

Given (10), John cannot coherently locate himself at a time at which Bill writes a letter to Mary at t and locate himself at a time at which Bill writes a letter to Mary at all subintervals of t . But since *glad* is also stative, the acceptability of (7) calls for explanation.

Notice that the cases with *believe* and *claim* are improved by progressive marking:

11a. John believes Bill to be writing a letter to Mary.

11b. John claims to be writing a letter to Mary.

We propose that the semantics of *glad* mimics this effect by incorporating progressive meaning directly:

12. $\llbracket \text{glad} \rrbracket^{c,g} = \lambda P_{\langle e, \langle i, \langle s, t \rangle \rangle \rangle} \lambda x_e \lambda t_i \lambda w_s. \forall \langle w', t', y \rangle$: it is compatible with what x believes in w at t for x to be y in w' and t to be $t' \rightarrow \exists t''$: $t' \subseteq t''$ & $P(y)(t'')(w')$. $\forall \langle w', t', y \rangle$: being in a position to identify himself as y in w' and t'' as t' makes John feel glad in w at $t \rightarrow \exists t''$: $t' \subseteq t''$ & $P(y)(t'')(w')$

The semantics thus makes reference to temporal containment, as does that of future- and past-oriented control predicates:

13. $\llbracket \text{intend} \rrbracket^{c,g} = \lambda P_{\langle e, \langle i, \langle s, t \rangle \rangle \rangle} \lambda x_e \lambda t_i \lambda w_s. \forall \langle w', t', y \rangle$: it is compatible with what x intends in w at t for x to be y in w' and for t to be $t' \rightarrow \exists t''$: $t' \subset t''$ & $\neg \exists t'''$: $t'' \subset t'''$ & $t'' < t'''$ & $\exists t''''$: $t'' \subset t''''$ & $P(y)(t''''(w'))$

14. $\llbracket \text{remember} \rrbracket^{c,g} = \lambda P_{\langle e, \langle i, \langle s, t \rangle \rangle \rangle} \lambda x_e \lambda t_i \lambda w_s. \forall \langle w', t', y \rangle$: it is compatible with what x remembers in w at t for x to be y in w' and for t to be $t' \rightarrow \exists t''$: $t' \subset t''$ & $\neg \exists t'''$: $t'' \subset t'''$ & $t'' < t'''$ & $\exists t''''$: $t'' \subset t''''$ & $P(y)(t''''(w'))$

A simple amendment to these entries makes way for a semantics of PC: the notion of ‘containment’ is no longer confined to the temporal dimension, but rather applied to the world-time-individual triples that canonical attitude predicates quantify over. We define an ‘extension’ of such triples as follows.

15. For any pair of world-time-individual triples $\langle w, t, x \rangle$ and $\langle w', t', y \rangle$, $\langle w', t', y \rangle$ is an *extension* of $\langle w, t, x \rangle$ iff:

(i) $w \leq w'$; (ii) $t \leq t'$ or $\exists t''$: $t \leq t''$ & $t' \leq t''$; and (iii) $x \leq y$

The semantics of attitude predicates that exhibit Property II now incorporates this notion:

16. $\llbracket \text{intend} \rrbracket^{c,g} = \lambda P_{\langle e, \langle i, \langle s, t \rangle \rangle \rangle} \lambda x_e \lambda t_i \lambda w_s. \forall \langle w', t', y \rangle$: it is compatible with what x intends in w at t for x to be y in w' and for t to be $t' \rightarrow \exists \langle w'', t'', z \rangle$: $\langle w'', t'', z \rangle$ is an extension of $\langle w', t', y \rangle$ & $P(z)(t'')(w'')$

Analysis of partial control: This semantics renders partial control sentences straightforwardly interpretable:

17a. John intends to assemble in the hall.

17b. $[\text{CP}_1 \lambda t_1 \lambda w_2 [\text{IP}_1 \text{John intends}_{t_1, w_2} [\text{CP}_2 \lambda x_3 \lambda t_4 \lambda w_5 [\text{IP}_2 \text{PRO}_3 \text{to assemble in the hall}_{t_4, w_5}]]]]]$

17c. $\llbracket [17c] \rrbracket^{c,g} = \lambda t \lambda w. \forall \langle w', t', y \rangle$: it is compatible with what x intends in w at t for x to be y in w' and for t to be $t' \rightarrow \exists \langle w'', t'', z \rangle$: $\langle w'', t'', z \rangle$ is an extension of $\langle w', t', y \rangle$ & z go to the movies together in w'' at t'' .

Consequences: (A) We provide an account of why Properties (I) and (II) are jointly necessary and sufficient for membership in the PC class. Partial control arises as a consequence of existential quantification over extensions of centred worlds. Only canonical attitude predicates make reference to centred worlds in their semantics (Property I), and only predicates whose semantics involves temporal containment appeal to existential quantification over extensions of centred worlds (Property II).

(B) Following [5], PRO is abstracted over, yielding a property. The analysis is compatible with any mechanism whereby PRO inherits ϕ -features from the controller. The inability of PC PRO to license plural anaphors, exemplified in (18), is therefore no longer surprising.

18. *John intended to meet each other in the hall.

(C) The proposal builds on Landau’s observation that PC predicates often tolerate mismatching temporal modifiers but EC predicates typically do not [1]. There are counterexamples to this generalization in both directions, however - it is flouted by the EC predicate *deserve* and the PC predicate *enjoy*:

19. Today John deserves to go the movies tomorrow.

20. *Today John enjoys going to the movies tomorrow/yesterday.

We can explain this: *deserve* is in the EC class because it is not an attitude predicate, and *enjoy* is in the PC class because the crucial temporal property is containment, not the availability of mismatching temporal modifiers.

References: [1] Landau, I. (2000) PhD dissertation. [2] Sharvit, Y. (2003) *JoS*. [3] Grano, T. (2011) *SALT*. [4] Ogihara, T. (2007) *Lingua*. [5] Chierchia, G. (1990). *Semantics and contextual expression*.