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Two moving parts (at least):

- A model of certain mental states—intention, planning.
- An account of the meaning of plan and intention ascriptions.

Their model of planning states departs quite radically from a naïve Hintikka-style model. To model a planning state, on their view, we need more structure than is provided by a set of worlds or a set of propositions. Instead, we need (at least) sets of propositions and a binary relation over them, something *like* a means-end relation.

I will have little to say about their model of planning and intention states—I find it plausible even if I'm not sure it's the final word on the matter. Instead, I want to focus on their story about plan talk.

Someone can plan to hop on the bus and plan to go to the store without planning to hop on the bus *as a means* to go to the store. To understand your plans, I need to know more than just what's on your todo list.

MOTIVATING THEIR ACCOUNT

MY are motivated by a series of observations. I discuss three of them.

The first is that ‘plans’ (the verb) seems to take ‘stacked infinitivals’, as in:

- (1) John plans to hop on the bus to go the store to get groceries to make dinner.
- (2) Mary plans to wake up early to get on her bike early enough to make it to work in time for the meeting.

The second is about entailment patterns involving such claims (for now I borrow their syntactic assumptions):

Plan Distributivity: S plans σ_1 entails S plans σ_2 whenever σ_2 is a contiguous subsequence of σ_1 .

No skipping: If σ_2 is not a contiguous subsequence of σ_1 , S plans σ_1 does not entail S plans σ_2 .

Non-commutativity: If σ_1 is a non-trivial permutation of σ_2 , S plans σ_1 does not entail S plans σ_2 .

The final observation is that complex plan ascriptions, “by their very meaning”, offer answers to a series of *how* and *why* questions:

Plan-why link: If $\phi_1\phi_2$ is a contiguous subsequence of σ , then S plans σ entails that ϕ_2 is the answer to the *why* question corresponding to ϕ_1 .

Note that I'm using σ to denote sequences of sentences that denote centered world propositions. And I omit what we could call the *Plan-how* link since plausibly it follows from the *Plan-why* link.

CLIFF NOTES

The details of their semantics are a bit complex, so let me just do a quick recap.

On the MY view, ‘intends’ and ‘plans’ quantify over *teleologies*. Simplifying quite a lot, we can think of a teleology as a finite list of centered propositions of increasing strength (perhaps modulo background assumptions). So, e.g., a teleology could be:

$$\{\langle x, w \rangle : x \text{ goes to the store in } w\}, \{\langle x, w \rangle : x \text{ goes to the store and gets groceries in } w\}$$

A planning state, then, is a set of such lists, or rather a set of such lists that satisfies some reasonable closure conditions. And once we have a planning state, we can determine the truth-value of a planning ascription, by relying on their notion of *settling*, or rather my simplification of it:

DEFINITION: A list of sentences σ is *exactly settled* by a teleology τ iff τ and σ are of equal length and for each $i \leq |\sigma|$, $[\sigma_i]$ is entailed by τ_i . A list of sentences σ is *settled* by τ iff there is a continuous subsequence of τ which exactly settles σ .

At last, then, we have:

S plans σ is true in w iff there is a teleology in S 's planning state in w which settles σ .

Note that the reason we get from e.g. (1) that John's going to the store is a reason for him to hop on the bus comes cannot be read off of the meaning of the complement of ‘plans’. Rather, it comes from the interaction of the verb and the complement clause.

NESTED STRUCTURES

MY suggest that we use a variadic operator to understand planning ascriptions. As they acknowledge, this is a non-trivial move.

They offer two reasons for positing this structure. The first is an argument by elimination. The second is one about complexity.

I found the second reason somewhat unpersuasive. There are plenty of nested constructions no more complex than their running examples would be with a nested structure:

- (3) John visited the city with the museum with the painting with the screaming guy.

No-one would want to treat this as having the structure of a flat list of prepositional phrases.

Similarly, it seems natural to think of the infinitival clauses in

The intended interpretation, roughly: if pq is a contiguous subsequence, p is a means to q .

Again, I'm simplifying a lot here—strictly, on their view, a teleology has more structure than this, and there's some subtle issues about how to handle closure that I will not get into here.

Of course, one doesn't get famous making only trivial moves, so non-trivial moves are to be expected here and there. The question is whether this non-trivial move is well-motivated.

It would be natural to think of the following structure, here:

- (4) John visited [the city [with the museum [with the painting [with the screaming guy.]]]]]

- (5) John plans to visit the city to go to the museum to see painting with the screaming guy.

as each qualifying the preceding ones, perhaps as in:

- (6) John plans [to visit the city [to go to the museum [to see the painting with the screaming guy.]]]]]]

True, if what's going on here is a nested sequence of modal operators, we would expect them to be harder to parse. But perhaps an event semantics-like story could be told here, on which (6) is akin to

- (7) John plans to visit the city, the reason for which is to go to the museum, the reason for which is to see the painting of the screaming guy.

and thus not unlike

- (8) John is standing by a table, the leg of which touches a chair, the back of which touches a wall.

A flat list approach makes two things hard to explain. One is that it is at the very least quite difficult to target a subsequence of infinitivals using ellipsis:

- (9) ?John plans to visit the museum to see the painting with the screaming guy. Mary does so too: she plans to see the painting on her computer at home.

Another, more important, is that we can find what sure look like structural ambiguities in these constructions. Contrast:

- (10) I plan to go the store to get groceries to make dinner.
 (11) I plan to go to the store to get groceries to get some exercise.

On one reading of (11), what I do to get to get some exercise is go the store—the store is far away and I can only walk there, say. But on another reading, what I do to get exercise is get groceries: the store is nearby, it's just that they have no shopping carts and I need to carry all the heavy groceries as I move around the store. On MY's story, however, there's just one structure available:

- (13) I plan [PRO to go the store] [PRO to get groceries] [PRO to get some exercise].

WHENCE THE STRUCTURE?

As MY point out, these 'multiclausal complements' can be found in many places.

I feel like I'm setting myself up here: "We don't think this more conventional approach is misguided. Indeed, there is much to be said on its behalf. Further, we think it is probably possible to square this more conventional approach with the model of intention we have motivated. It's just that when we have tried doing things that way, we have found that the compositional semantics gets inordinately complicated."

This all suggests that some kind of event semantics may be a way to handle these.

This second reading is presumably even more easily available with:

- (12) I plan to go to the store to get groceries to get out of the house.

- (14) I plan to go the store to buy ice cream to bring to the party
- (15) I agreed to go the store to buy ice cream to bring to the party

As they put it, “[p]retty much any verb that assigns an agent θ -role will license telic infinitivals. (And stacks of them.)”

But even this, as they acknowledge, understates the extent to which these constructions are widespread: stacked infinitivals can be bound by “non-sentient beings and artifacts” (cf. their dishwasher example).

Admittedly, these could be explained away as anthromorphizations of sorts. But the range of examples involving sentient subject with verbs that do not assign an agent θ -role is quite long:

- (16) I expect to go to the store to buy ice cream to bring to the party.
- (17) I am afraid to go the store to buy ice cream to bring to the party.
- (18) I hope to go the store to buy ice cream to bring to the party.
- (19) I remembered to go the store to buy ice cream to bring to the party.
- (20) I should go to the store to buy ice cream to bring to the party.
- (21) To go the store to buy ice cream to bring to the party is a bad idea.

It would be surprising if we needed to revise our semantics for all of these verbs to have them quantify over teleologies.

Indeed, the explanatory structure—the one that has my buying the ice cream as a reason for my going to the store—need not even come from the subject controlling the infinitival clauses. Consider:

- (22) I asked my students to go to the talk to impress the speaker.

There are at least three readings of this sentence. The one that interests me can be paraphrased like so:

I asked my students: “please go to the talk”. I know they’re very strong students and I know they will impress the speaker, but not if they try to impress.

So it seems as if, semantically, we need something that determines what structures the contents of these infinitival clauses, something that isn’t always given by whatever controls their subject.

A plausible story here is that the arguments to all the verbs above by themselves state that there is some kind of explanatory relation between the infinitival clauses.

Consider also: *I expect to get numbed to have my tooth removed to be free of pain.*

What would we do with the last one?!

A second reading has the impressing be among the things I asked my students to do. A third reading has the impressing done by me, not the students.

An interesting question is whether the source of this structure must be realized syntactically. Consider: “My students were told to go to the talk to impress the speaker.” Are all three readings equally available?

In Spanish, for instance, we cannot just stack infinitives without prepositions (*para* or *a*) in between. French is a bit in between, varying with the verb: *Je vais au marché acheter des légumes pour préparer le dîner.*

DISTRIBUTIVITY

Once we notice how widely distributed these stacked or nested infinitivals are, Plan Distributivity becomes even more puzzling.

Consider:

- (23) I am afraid to go the store to buy ice cream.

This does not entail

- (24) I am afraid to buy ice cream.

It doesn't even entail

- (25) I am afraid to go the store.

Why then does

- (26) I plan to go the store to buy ice cream.

entail (27)?

- (27) I plan to buy ice cream.

MY's proposal of course easily accounts for this. After all, on their view, when I say

- (28) I plan to go the store to buy ice cream.

I am basically saying that I plan to go the store and that I plan to buy ice cream—it's just that I'm also saying more.

How could the adverbial story I have sketched account for Plan Distributivity?

The answer, I suspect, has little to do with the matrix verb. Rather, it has to do with the explanatory relation that is said to obtain between the infinitival clauses.

To see what I have in mind, consider:

- (29) I was a fool to go to the store to buy ice cream.

This does not imply, to be sure, that I was a fool to buy ice cream. But it does imply, much like our previous sentence, that I *intended* to buy ice cream by going to the store.

The thing I was a fool to do—go to the store as a means to buying ice cream—is what ensures that I had the right intention.

Contrast this with:

- (30) I was brainwashed to go to the store to buy ice cream.

Similarly “I should go the store to buy ice cream” does not entail “I should buy ice cream”—I may simply want to buy ice cream, and it is only given that desire that I should go to the store.

Viz., that my going to the store answers the deliberative question *how should I buy ice cream?*

It does not follow from this that I intended to buy ice cream by going to the store, precisely because the natural reading of this sentence is one in which my buying ice cream is *the hypnotizer's* purpose in getting me to go to the store.

Or to go back to (23)—the thing I am afraid to do is something which, were I to do it, I would do with the intention of buying ice cream.

Indeed, it seems to me we can get a similar phenomenon under ‘plan’, as long as the plan ascription is suitably embedded:

- (31) His advisors told him to plan to ask a question to impress the speakers, and he did as he was told.

I get a reading of this—don't you?—on which he planned to ask a question, the purpose of his asking the question was to impress the speaker, but the purpose wasn't, as it were, his own. Rather, it was *his advisor's* purpose that he impress the speaker by planning to ask a question.

If this is right, then it is a mistake to expect to derive Plan Distributivity as a corollary of our semantics for ‘intend’. Rather, the story will come from understanding what these sequences of infinitival clauses mean. A model of intention may well be needed to do that. But perhaps our semantics for ‘intends’ may not need all the model's bells and whistles.

In other words: I get a reading of (31) on which doing what his advisors told him to do is compatible with him not intending to impress the speakers.