Hidden imperatives*

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Our goal: A semantics for (1)–(2)

(1) a. Confidentially, Ed is a werewolf.
b. Seriously, the exam is today.

(2) a. Confidentially, is Ed a werewolf?
b. Seriously, is the exam today?

Requirements for (1)–(2)

(3) a. a theory of declaratives: propositions and assertions
b. a theory of interrogatives: sets of propositions and questions
c. a theory of imperatives: propositions and *to-do lists*

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The Speech-Acts Game

The Speech-Acts Game provides an accessible introduction to our theory of speech-acts and their role in semantic theory. It is a limited but representative simulation of our theory.

How and where to get it

Links to the Speech-Acts Game, along with some instructions about how to run it, are available here:

http://people.ucsc.edu/~isaacs/speech-acts-game.html

At nearly every move, one has the option of pausing to read about the connections between what the game is doing and our theory, which is based on the dynamics of Groenendijk (1999) and, more broadly, on the theories of imperatives advanced by Segerberg (1990), Han (1998), Lascarides and Asher (2003), and recent work by Paul Portner.

More fully dynamic

For a preliminary version in which the context and to-do lists are more fully integrated with the possible-worlds dynamics, we refer to the following handout by Chris Potts, which is from a talk he gave in NYU's Syntax/Semantics Lecture Series, October 17, 2003:

http://people.umass.edu/potts/potts-nyu-handout.pdf

Structures

A model $\mathcal{M}$ for $\mathcal{L}$ is a tuple $(D, W, \mathcal{C}, \textbf{TO-DO}, [\![\cdot]\!])$, where

1. D is a domain of entities; W is a set of worlds;
2. $\mathcal{C} = D \times D \times W$ is a set of contexts; each $c \in \mathcal{C}$ is a tuple $\langle c_A, c_H, c_W \rangle$, where
   (a) c_A is the agent (speaker) of c;
   (b) c_H is the hearer (addressee) of c;
   (c) c_W is the world of c;
3. **TO-DO** is a set of lists of propositions; $\textbf{TO-DO}_a$, a member of **TO-DO**, is the to-do list of the individual a.
4. $[\![\cdot]\!]$ is an interpretation function.

The interpretation function for a given $\mathcal{M}$ is $[\![\cdot]\!]^{\mathcal{M},c}$, which takes formulae to objects of $\mathcal{M}$ relative to the context $c \in \mathcal{C}$.

A *discourse set* is a triple $\left(W \times W, \begin{array}{c} \textbf{TO-DO}_{c_A} \\ \textbf{TO-DO}_{c_H} \end{array} \right)$.

The dynamic update function is $\bullet$. It takes a pair consisting of a sentence meaning (indicative, interrogative, imperative) and a discourse set to return a discourse set.

Propositions and assertions

Propositions

A proposition is a set of worlds, i.e., a subset of W.

$$[\![\textbf{tired}(\textbf{ed})]\!]^{\mathcal{M},c} = \text{ the set of all worlds at which Ed is tired}$$

A dynamic perspective

Let π range over proposition-denoting terms.

$$\left(W \times W, \begin{array}{c}\textbf{TO-DO}_{c_A} \\ \textbf{TO-DO}_{c_H}\end{array}\right) \bullet [\![\pi]\!]^{\mathcal{M},c} = \left(\left\{\langle w, w'\rangle \in W \times W \mid [\![\pi]\!]^{\mathcal{M},c}(w) = [\![\pi]\!]^{\mathcal{M},c}(w') = 1\right\} \times \begin{array}{c}\textbf{TO-DO}_{c_A} \\ \textbf{TO-DO}_{c_H}\end{array}\right)$$

The update is defined only if every presupposition p of π is such that

$$\left(W \times W, \begin{array}{c}\textbf{TO-DO}_{c_A} \\ \textbf{TO-DO}_{c_H}\end{array}\right) \bullet p = \left(W \times W, \begin{array}{c}\textbf{TO-DO}_{c_A} \\ \textbf{TO-DO}_{c_H}\end{array}\right).$$

From the Speech-Acts Game

```
Here are some facts to start with:

  [[hungry(ed)]]           = {w1 w2 w3 w4   }
  [[eating(ed,the-pie)]]   = {w1 w2 w3      }
  [[full(ed)]]             = {   w2 w3      }

<w1,w1>    <w2,w1>    <w3,w1>    <w4,w1>    <w5,w1>
<w1,w2>    <w2,w2>    <w3,w2>    <w4,w2>    <w5,w2>
<w1,w3>    <w2,w3>    <w3,w3>    <w4,w3>    <w5,w3>
<w1,w4>    <w2,w4>    <w3,w4>    <w4,w4>    <w5,w4>
<w1,w5>    <w2,w5>    <w3,w5>    <w4,w5>    <w5,w5>

Please enter a proposition: full(ed)
Here is the resulting model:

 -----      -----      -----      -----      -----
 -----     <w2,w2>    <w3,w2>     -----      -----
 -----     <w2,w3>    <w3,w3>     -----      -----
 -----      -----      -----      -----      -----
 -----      -----      -----      -----      -----
```

Questioning

$$[\![?\big(\textbf{captured}(\textbf{ed})\big)]\!]^{\mathcal{M},c} = \left\{ \begin{array}{l} \{\, w \in W \mid [\![\textbf{captured}(\textbf{ed})]\!]^{\mathcal{M},c}(w) = 1 \,\} \\ \{\, w \in W \mid [\![\textbf{captured}(\textbf{ed})]\!]^{\mathcal{M},c}(w) = 0 \,\} \end{array} \right\} \quad \text{(Hamblin 1976)}$$

Groenendijk's (1999) interrogative update

$$\left(W \times W, \begin{array}{l} \textbf{TO-DO}_{c_A} \\ \textbf{TO-DO}_{c_H} \end{array}\right) \bullet [\![?\pi]\!]^{\mathcal{M},c} = \left(\left\{\langle w, w'\rangle \in W \times W \mid [\![\pi]\!]^{\mathcal{M},c}(w) = [\![\pi]\!]^{\mathcal{M},c}(w')\right\}, \begin{array}{l} \textbf{TO-DO}_{c_A} \\ \textbf{TO-DO}_{c_H} \end{array}\right)$$

From the Speech-Acts Game

```
Here are some facts to start with:

  [[hungry(ed)]]           = {w1 w2 w3 w4   }
  [[eating(ed,the-pie)]]   = {w1 w2 w3      }
  [[full(ed)]]             = {   w2 w3      }

<w1,w1>    <w2,w1>    <w3,w1>    <w4,w1>    <w5,w1>
<w1,w2>    <w2,w2>    <w3,w2>    <w4,w2>    <w5,w2>
<w1,w3>    <w2,w3>    <w3,w3>    <w4,w3>    <w5,w3>
<w1,w4>    <w2,w4>    <w3,w4>    <w4,w4>    <w5,w4>
<w1,w5>    <w2,w5>    <w3,w5>    <w4,w5>    <w5,w5>

Please enter an interrogative: ?(full(ed))
Here is the resulting model:

<w1,w1>     -----      -----     <w4,w1>    <w5,w1>
 -----     <w2,w2>    <w3,w2>     -----      -----
 -----     <w2,w3>    <w3,w3>     -----      -----
<w1,w4>     -----      -----     <w4,w4>    <w5,w4>
<w1,w5>     -----      -----     <w4,w5>    <w5,w5>
```

Commanding: The world and the will apart

Imperatives along many paths

We aim for a unified treatment of the following kinds of imperative:

(4) a. Frolic in the park! (speaker-to-addressee imperative)
b. Let's frolic in the park! (discourse-inclusive imperative)
c. I promise to frolic in the park. (self-directed imperative)

A promise is a command that is exclusively self-directed.

Imperatives as speech acts in every sense

We seek a literal interpretation of Segerberg's (1990) insight (5):

(5) "First, we try to keep the world and the will apart." (Segerberg 1990:204)

This separation is often acknowledged, but it is less often reflected in the formalism.

From the Speech-Acts Game

```
Please enter a formula (L for lexicon, F for facts):
do(ross)(wash(ross,hands-of-ross))

I have updated my to-do list to reflect your directive.

TO-DO LISTS
ross: [{ w1  w2  w4 }]          thora: [{ }]

I will now discharge your command from my to-do list by
updating the context.

TO-DO LISTS
ross: [{ }]                     thora: [{ }]

Here is the resulting model:
<w1,w1>    <w2,w1>     -----      <w4,w1>     -----
<w1,w2>    <w2,w2>     -----      <w4,w2>     -----
 -----      -----      -----       -----      -----
<w1,w4>    <w2,w4>     -----      <w4,w4>     -----
 -----      -----      -----       -----      -----
```

Comments on do

A limitation on the first (individual) argument to do

We should ensure that the entity argument is a discourse participant (either the speaker or the hearer); one cannot felicitously demand things of individuals who are not present to hear the associated imperative.

Context update; no change to the world-set

The **do** operator does not change the set of worlds pairs. The change happens in the context coordinate: the proposition that is demanded is added to the to-do list of the entity argument.

This makes sense; unfortunately, if we say to you, *Write your name on the first page of this handout!*, your name is not thereby written. The job is merely added to your to-do list.

Lists

Lists are rarely used in linguistics. Linguists seem to prefer sets. But, in many situations, lists are easier to work with and more appropriate than sets. One does not write grocery sets, but rather grocery lists. The phrase ‘to-do list’ is widely used basically as we use it in this theory.

Append

The function $\gg$ appends propositions to to-do lists; $\textbf{TO-DO}_a \gg \varphi$ is the extension of $\textbf{TO-DO}_a$ with the proposition denoted by φ.

Promises

I promise to frolic in the park $\rightsquigarrow$

$$\left(W \times W, \begin{array}{l}\textbf{TO-DO}_{c_A} \\ \textbf{TO-DO}_{c_H}\end{array}\right) \bullet [\![\textbf{do}(\textbf{I})(\textbf{frolic}(\textbf{I}))]\!]^{\mathcal{M},c} = \left(W \times W, \begin{array}{l}\textbf{TO-DO}_{c_A} \gg \textbf{frolic}(\textbf{I}), \\ \textbf{TO-DO}_{c_H}\end{array}\right)$$

Let's imperatives

Let's frolic in the park $\rightsquigarrow$

$$\left(W \times W, \begin{array}{l}\textbf{TO-DO}_{c_A} \\ \textbf{TO-DO}_{c_H}\end{array}\right) \bullet [\![\textbf{do}(\textbf{I})(\textbf{frolic}(\textbf{I}))]\!]^{\mathcal{M},c} \bullet [\![\textbf{do}(\textbf{you})(\textbf{frolic}(\textbf{you}))]\!]^{\mathcal{M},c} = \left(W \times W, \begin{array}{l}\textbf{TO-DO}_{c_A} \gg \textbf{frolic}(\textbf{I}), \\ \textbf{TO-DO}_{c_H} \gg \textbf{frolic}(\textbf{you})\end{array}\right)$$

Collective readings

(6) Let's take a ride on the tandem bike!

We can represent this by assuming plural-individual formation: **I**+**you**

Some pragmatic restrictions

Redundancy

One should not be able to command things that are already true:

$$\left(W \times W, \begin{array}{c}\textbf{TO-DO}_{c_A} \\ \textbf{TO-DO}_{c_H}\end{array}\right) \bullet [\![\textbf{do}(\textbf{a})(\pi)]\!]^{\mathcal{M},c}$$

is defined only if there is at least one identity pair $\langle w, w\rangle \in W \times W$ such that $[\![\pi]\!]^{\mathcal{M}}(w) = 0$

Cooperativeness

If one accumulates too many items in one's to-do list, one is likely to be deemed uncooperative. But the details are highly dependent on the context and the nature of the items on the list.

Utterance modifiers: Hidden imperatives

Utterance modifiers are well-studied, under a variety of names: *utterance modifiers* (Bach 1999), 'second-order speech act' (Bach 1999), 'pragmatic adverb' (Bellert 1977), and 'illocutionary adverbial'
(Bach and Harnish 1979).

These linguistic items permit speakers to qualify, restrict, and modify their relationships to the sentences they utter.

Our focus is on the uses of these in which the utterance modifier creates a hidden imperative:

(7) a. Confidentially, Ed is a werewolf.
≈Keep the fact that Ed is a werewolf confidential.
b. Confidentially, is Ed a werewolf?
≈I promise to keep the answer to *Is Ed a werewolf?* a secret.
c. Honestly, has Ed fled?
≈Provide me with an honest answer to the question *Has Ed fled?*

The guiding idea

The utterance modifiers represented in these examples create a situation in which a single sentence involves two distinct speech acts:

1. Where the complement is a declarative, they both demand and assert.
2. Where the complement is an interrogative, they both demand and question.

Hidden imperatives with declaratives

$$\left(W \times W, \begin{array}{l}\textbf{TO-DO}_{c_A} \\ \textbf{TO-DO}_{c_H}\end{array}\right) \bullet [\![\textbf{confidentially}(\pi)]\!]^{\mathcal{M},c} =$$

$$\left(\left\{\langle w, w'\rangle \in W \times W' \mid [\![\pi]\!]^{\mathcal{M},c}(w) = \left([\![\pi]\!]^{\mathcal{M},c}(w') = 1\right\}, \begin{array}{l}\textbf{TO-DO}_{c_A}, \\ \textbf{TO-DO}_{c_H} \gg \textbf{keep}(\textbf{confidential}(\pi))(\textbf{you})\end{array}\right)$$

Hidden imperatives with interrogatives

$$\left(W \times W, \begin{array}{l}\textbf{TO-DO}_{c_A} \\ \textbf{TO-DO}_{c_H}\end{array}\right) \bullet [\![\textbf{confidentially}(?\pi)]\!]^{\mathcal{M},c} =$$

$$\left(\left\{\langle w, w'\rangle \in W \times W' \mid [\![\pi]\!]^{\mathcal{M},c}(w) = \left([\![\pi]\!]^{\mathcal{M},c}(w')\right\}, \begin{array}{l}\textbf{TO-DO}_{c_A} \gg \textbf{keep}(\textbf{confidential}(\pi))(\textbf{I}) \\ \textbf{TO-DO}_{c_H}\end{array}\right)$$

Looking ahead

1. The distinction between willful and non-willful imperatives (e.g., suggestions, instructions, requests) (Hamblin 1987:45).
2. Conditionalized imperatives (e.g., *Got a problem, call Fat Tony*)
3. Suppositions

References

Bach, Kent. 1999. The myth of conventional implicature. *Linguistics and Philosophy* 22(4):367–421.

Bach, Kent and Robert M. Harnish. 1979. *Linguistic Communication and Speech Acts*. Cambridge, MA: MIT Press.

Bellert, Irena. 1977. On semantic and distributional properties of sentential adverbs. *Linguistic Inquiry* 8(2):337–351.

Groenendijk, Jeroen. 1999. The logic of interrogation. In Tanya Matthews and Devon Strolovitch, eds., *Proceedings of SALT IX*, 109–126. Ithaca, NY: Cornell University.

Hamblin, Charles L. 1976. Questions in montague english. In Barbara H. Partee, ed., *Montague Grammar*, 247–259. New York: Academic Press. Also in *Foundations of Language* 10: 41–53 (1973).

Hamblin, Charles L. 1987. *Imperatives*. London: Blackwell.

Han, Chung-hye. 1998. *The Structure and Interpretation of Imperatives: Mood and Force in Universal Grammar*. Ph.D. thesis, University of Pennsylvania.

Lascarides, Alex and Nicholas Asher. 2003. Imperatives in dialogue. In P. Kuehnlein, H. Rieser, and H. Zeevat, eds., *The Semantics and Pragmatics of Dialogue for the New Millenium*. Amsterdam: John Benjamins.

Segerberg, Krister. 1990. Validity and satisfaction in imperative logic. *Notre Dame Journal of Formal Logic* 31(2):203–221.