Foundations of Language Interaction

HANDOUT FIVE

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1 Introduction

Today—at last—we can look at INTENTIONS IN COMMUNICATION.

2 Grice on Meaning

In [Grice, 1957], Grice is trying to do TWO things, corresponding to two definitions on page 385.

(1) "*A* meant$_{\text{NN}}$ something by *x*" is (roughly) equivalent to "*A* intended the utterance of *x* to produce some effect in an audience by means of the recognition of this intention.

(1) is a characterization of communicative reasoning and particular processes in conversation. Thomason refines this as in (2) in next time's reading [Thomason, 1990].

(2) To mean *p* is to intentionally reveal an intention to make *p* asserted through the hearer's recognition of the status of an intention or plan of the speaker's.

More on this soon.

(3) "*x* means$_{\text{NN}}$ (timeless) that so-and-so" might as a first shot be equated with some statement or disjunction of statements about what "people" (vague) intend (with qualifications about "recognition" to effect by *x*.

(3) is a proposal about where our intuitions about linguistic meaning come from. In unpacking linguistic meanings into generalizations about what speakers do, (3) suggests a way of demystifying knowledge of meaning, learning of meaning, and so forth.

(4) I must disclaim any intention of peopling all our talking life with armies of complicated psychological occurrences.

This is 1957—the same year as *Syntactic Structures* and Newell and Simon's *General Problem Solver*. Grice is writing to the behaviorists that are still running around with dumb ideas about grounding the meanings of words and sentences in learned associations between sounds and referents. Yet Grice would not accept, nor even recognize, the modern conception of knowledge of meaning realized as a computational system in the semantic component of a speaker's grammar. (3) may be as outdated as (4).

3 Linguistic Intentions

From last time.

(5) a Terry asks whether *p* is true.
b Sandy attributes an intention to Terry. Here is the content. Terry asks whether *p* is true, Sandy replies with the answer. As a result of these actions everybody knows whether *p* is true.
c Sandy thinks this intention can be realized, because she knows whether *p* is true (say it's true). So Sandy commits to this intention herself.
d Sandy deliberates, and decides to reply `yes` based on matching up the information required in Terry and Sandy's intention with the information Sandy actually has now.
e Terry recognizes Sandy's reply as meeting his expection and completing their joint execution of the original intention. Everyone knows *p* is true.

A theory of replying:

(6) If *Q* is a question we are considering at this point in the dialogue, and the answer to *Q* is *A*, and the expression *E* can mean *A*, then *replying to Q by saying E* can achieve the result that everybody knows that the answer to *Q* is *A*.

A strips formalization:

(7)
```
is_action (reply Q E)
          (k all (want Q) ::  answer Q E ::
                    k all (o_name A E) ::  nil)
          (k all (answer Q A) ::  nil)
          nil.
```

Aside: linguistic action and grammatical theory.

(8) a Utterance = action.
b Precondition = presuppostion.
c Addition = assertion.
d Deletion = change in salience in discourse? Or not meaningful?

Another aside.

(9) a To account for Grice's means$_{NN}$ we should also represent the MECHANISM in the theory of (6) and (7).
b Those of you who struggled through Pollack's definition of Conditional Generation of actions know one way this might work: (6) is part of a THEORY or CONTEXT that appeals to an implicit CONDITION or set of circumstances. These conditions describe the prerequisites for the process of intention-recognition and collaboration in conversation.
c [CONVERSATION]: If *Q* is a question we are considering at this point in the dialogue, and the answer to *Q* is *A*, and the expression *E* can mean *A*, then *replying to Q by saying E* can achieve the result that everybody knows that the answer to *Q* is *A*.

A plan to answer a question:

(10)
```
(find (reply Q E)
 (know Agent (k Agent (k all (want Q)) ::
              k Agent (answer Q A) ::
              k Agent (k all (o_name A E)) ::
              nil)
  (step (k all (want Q) ::
        answer Q A ::
        k all (o_name A E) ::
        nil)
   Agent (reply Q E)
   (finish all (k all (answer Q A) ::  nil)))))
```

Recall as always.

(11) a When the agent commits to the plan, the agent makes sure it applies.
b This means proving `answer Q A` and `k all (o_name A E)`.
c In logic programming this will set `A` to an answer that the agent knows and, by grammatical reasoning, set `E` to any expression that could refer to `A`

4 Linguistic Intention Recognition

Since we've put off questions of search for plans, recognition means finding a match between a template you have, like the template in (10), the action you observe, and your current information. To start, that's at least:

(12) a Setting `E` to the observed answer, say `yes`.
b Setting `Q` to the observed question, if there was one. (Realistically there isn't—and the same story goes if we just use the action `reply E`—but we will assume `Q=q 1`.)
c Proving or assuming instances of the circumstancs of the plan that the agent who did the action must have checked before carrying out the plan.

A plausible starting assumption in step (12c) is that you must PROVE facts that attribute shared knowledge to the participants in the conversation (because you should really share your mutual beliefs). On the other hand, it is relatively painless to assume that your partner is acting on the basis of information you don't have. Here then:

(13) a Prove: `k all (want (q 1))`
b Prove: `k all (o_name A yes)`
c Assume: `k partner (answer (q 1) A)`

Observation one:

(14) a As always in logic, proving `k all (o_name A yes)` will instantiate `A` to a specific value.
b Hence an account of PRESUPPOSITION AS ANAPHORA [Kripke, 1991, van der Sandt, 1992]—resolve presuppositions by hypothesizing specific instances as mental representations behind an utterance.
c In this case, the candidate interpretations correspond to the things that `yes` means.

5 Intended Recognition

The key new thing from Grice is that in communication the speaker will INTEND this plan to be recognized.

(15) Committing to a communicative plan requires two checks. You must make sure that the plan applies. And you must make sure that the plan will be recognized as intended.

This means assessing the inference in (4) in a suitable context, and rejecting plans that don't work.

(16) a In this case, since `yes` only means `truth`, the plan is recognized.
b If you had a word `mmm` that could mean `truth` and could mean `falsehood`, then the plan to answer with this word wouldn't recognized. Therefore the word wouldn't be used.

6 Questions for Discussion and Research

(17) a What does it mean to recognize a communicative plan based on misconceptions? If the misconceptions are in what your partner assumes privately about the world? If the misconceptions are in what your partner takes to be shared?
b Once you have recognized a plan, what do you do with it? For example, does the plan achieve its effects?

These interdisciplinary problems are of central interest in current research, and are studied under headings like COOPERATIVE AGENCY (in computer science), ACCOMMODATION (in linguistics and philosophy) and GROUNDING (in psychology).

References

[Grice, 1957] Grice, H. P. (1957). Meaning. *The Philosophical Review*, 66(3):377–388.

[Kripke, 1991] Kripke, S. (1991). Presupposition and anaphora: Remarks on the formulation of the projection problem. transcript of a lecture given at Princeton.

[Thomason, 1990] Thomason, R. H. (1990). Accommodation, meaning and implicature. In Cohen, P. R., Morgan, J., and Pollack, M. E., editors, *Intentions in Communication*, pages 325–363. MIT Press, Cambridge, MA.

[van der Sandt, 1992] van der Sandt, R. (1992). Presupposition projection as anaphora resolution. *Journal of Semantics*, 9(2):333–377.