Introduction

- In dialogue, the major goal of both parties is to achieve mutual intelligibility
- To achieve this goal, both parties must co-ordinate their use and interpretation of language - they both need to be “playing the same language game” (Wittgenstein)
- How do people construct this common conceptional and semantic system?
- Garrod and Anderson ran an experiment in which participants had to cooperate to solve a joint maze, and then analyzed the dialogues that came from it

1 Meaning, co-ordination, and convention

- The co-ordination problem, in a nutshell: speakers have to select expressions to convey what is intended, and listeners have to select interpretations for those expressions in the hope that they capture the intended meaning
- Contrary to primary intuitions (and many writers), conventions are not written in stone, but rather depend on the coordination of action and belief, as well as mutual interest
- There needs to be a level of mutual knowledge of everyone’s expectations
- Several heuristic solutions have been suggested
  - Schelling 1960: People tend to choose the most salient option on the grounds that it is what they expect everyone else to choose
  - Schiffer 1972: Where it is mutually known what happened in previous similar situations, people opt for what happened then
– Lewis 1968: Combination - for regular recurrent situations, initial precedent tends to be followed, and over time will become the most salient choice

• Two major problems exist with allowing this problem to be taken care of by convention alone

  – Reference: successful reference requires more than just knowledge of convention
  – Natural language is inherently ambiguous and vague - there is not a one-to-one correspondence between words and meanings

• People have said that these problems are overcome by inferring the most likely interpretation given the listeners assessment of the context (which may include the speaker’s state of mind)

• It is likely, though, that language users have developed processes that take advantage of the interactive and collaborative aspects of dialogue, in order to reduce the complexity of the inferences required

• Garrod and Anderson hope to prove that this co-ordination is achieved locally within any particular dialogue by a joint effort by both parties, and the adoption of “idiosyncratic ‘languages’

2 The experiment

• The maze game was designed to elicit natural dialogues about location in a pre-defined spatial environment - this allowed the experimenters to independently verify the positions described

• Subjects were put in separate rooms with screens that had mazes on them. The mazes consisted of small boxes connected by paths. The goal was to move one’s marker to the goal box. Each player in a two-person team could see only his own start position, goal, and current position. Subjects needed to communicate because ‘gates’ on each person’s maze could only be opened by getting their teammate to land on a ‘switch’, marked only on their screen, not their teammate’s

• There were four variations of the game, but they were collapsed for this study - a game as described, a game with a ‘monster’ that could ‘eat’ a player, a game in which the maze shape was manipulated, and a game in which people who had previously participated were matched with people who had previously used a different method of describing location than them
3 Types of descriptions

- **Path description** - (most common) - ‘the listener is invited on a tour over the paths in the maze whose destination is the point to be described’
  
  (1) See the bottom right, go two along and two up. That’s where I am.

- **Co-ordinate description** - (next most common) - ‘depends upon establishing a co-ordinate scheme for the nodes in the maze’
  
  (2) I’m on the third row and fourth column.
  
  (3) I’m at C 4.

- **Line description** - ‘indicate[s] a position by first describing a particular line of nodes and then describing the position relative to this line’
  
  (4) Third bottom line, third box from the right.
  
  (5) Third column from the right, two from the bottom.
  
  (6) I’m one up on the diagonal from the bottom left to top right.

- **Figural description** - ‘depends upon first identifying some particular configuration of nodes (e.g., ‘a square’, ‘T shape’ or ‘a limb sticking out to the side’) and then indicating the position with respect to a decomposition of the figure.’
  
  (7) See the rectangle on the bottom right, I’m in the top left-hand corner.

4 Distribution of description types

- Almost half of the dialogues only contain descriptions of two types

- The overall distribution of description types is generally very similar for both speakers in any dialogue

- There is little relationship between patterns of description type across different dialogues

- There is general entrainment of description type between pairs of speakers in the same dialogue (speakers tended to do what their partner did, too), and there was greater entrainment in the second game (if there was one for that dyad)

- There is a general trend to transfer from figural to path and co-ordinate descriptions as the dialogue proceeds, as well as a trend to go from path to line type of descriptions - speakers seem to initially concentrate on descriptions that rely on salience (i.e., figural and path) but then move on to descriptions based on more abstract schemes (i.e., line and co-ordinate)
5 Semantic analysis of description types

- Cognitive theorists have promoted the idea that the mental representations that underly quite a few intellectual activities function as models of relevant aspects of the activity - these models capture crucial structural relationships between entities.

- We may think of the different description types as different mental models, each capturing a different overall conception of the maze’s spatial and functional organization.

- In a line type of description, any line, square, or other entity can be defined purely in terms of its relationship to other entities.

- Alternatively, the same relationships can be captured in terms of instructions that would enable someone to follow the path, moving from one element in the model to another.

- The participants must establish some restricted set of language which maps onto the model - e.g., ‘row’, ‘line’, ‘level’.

- Differences in descriptions, such as ‘the second row’ vs. ‘the second bottom row’ vs. ‘row two’ might reflect differences in the conceptual model of the maze.
  - Speakers who adopted descriptions like ‘row two’ always referred to the bottom row as ‘row one’, rather than ‘the bottom row’.
  - Those that used ‘the bottom second row’ used an intensifier to signal the bottom-most row ‘the very bottom row’.

- When we think about buildings, there is a pre-conventionalized way to describe the floors - we take for granted, for example, that ‘the second floor’ means the second floor from the bottom, rather than from the top. (Note that cross-linguistically this can vary - in Spanish el segundo piso (lit. ‘the second floor’) actually refers to the third floor from the ground, as la planta baja (lit ‘the low-down/base story) refers to the first floor).

- So, there seems to be evidence that dialogue pairs adopt rather specific ‘languages’ of description to map expressions onto interpretations. Once this ‘language’ is established, they try to avoid any potentially ambiguous use of that expression.

- Even when description of the type currently in use by a dyad would be very difficult, the dyads rarely switched - the speakers adopted a particular ‘language’ interpretable against a particular type of spatial model and cannot suddenly introduce a description that violates the locally established rules of interpretation.
6 Co-operative strategies and the output/input co-ordination principle

• While explicit negotiation about what kind of description to use did occur in the dialogues, it was neither a popular nor effective means of doing so - it happened mostly after many descriptions had already been given, and often the participants didn’t stick to it very long

• A major factor in conversational interaction seems to be a minimization of collaborative effort (Clark and Wilkes-Gibbs 1986 - participants should formulate their utterances in such a way that they do not have to spend unnecessary time or effort in ensuring mutual intelligibility)

• Output/input co-ordination - formulate your output according to the same principles of interpretation as those needed to interpret the most recent relevant input - speakers should be locally consistent with one another

• This principle is violated, but is noted, often by an explicit question from the other participant

• There are two major problems with the output/input co-ordination principle

  - It is too inflexible, it would predict that nothing would ever change in a dialogue
    * A solution: Divide up the labor, making one participant the leader and the other the follower (recall Lewis 1978’s master/slave distinction)
  - By this principle, so long as you can interpret the other person’s utterance using your own scheme, you presume that their scheme is identical to yours - even if it is not. It can take several turns before people realize that the schemes are not identical

7 Things to take away

• Pairs of speakers adopt very similar forms of description, suggesting a degree of entrainment between interlocutors

• Various description schemes rely on particular mental models in conjunction with some set of interpretation rules for expressions in the ‘language’

• By adopting local ‘languages’ speakers are able to achieve a high degree of co-ordination, since they are specialized and are not subject to the inherent ambiguity and vagueness of a language which depends on general conventions of a larger linguistic community
• Participants solved the co-ordination problem not through explicit negotiation, but rather by following a general interactive principle of co-ordinating output with input.

• General conventions of meaning may serve only as starting points for interpretation, perhaps giving way to more local and transient conventions set up during the course of a dialogue.