Language, Action, and Indexicality

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Since the work of Austin(1962) it has been widely recognized that language is not only used to refer and predicate, but also to do do things in the world — to perform actions of various sorts. The standard method within linguistics, philosophy, and AI of analyzing such actions is to uncover the propositional meaning of an utterance and then infer the actual action being performed on the basis of this meaning, the possible intentions of the hearer and speaker, and various proposed rules for interpretation.

An alternative approach has been utilized by more sociologically oriented researchers (ethnomethodologists, anthropologists). In this view various constructions function indexically to alter the context in which other forms are interpreted indexically. Much less use is made of the propositional meaning of utterances and inferences concerning the intentions of speakers and hearers. Rather, an elaborate typology of the rules of conversation and the structure of discourse is developed. See for example (Drew and Heritage 1992; Schegloff and Sacks 1973; Gumperz 1982). A number of authors have proposed integrating ethnomethodology into AI and computational linguistics (Suchman 1987; McRoy and Hirst 1995; Chapman 1991).

In my current research, I'm attempting to model verbal actions (from this latter perspective) using a particular logic of action — the situation calculus as developed in (Lespérance *et al.* 1994; Reiter 1991; Scherl and Levesque 1993). Verbal actions will be indexical with their effects specified as altering and being dependent on the context (a situation, a term of the situation calculus). This appropriateness of using situations to represent the locus of indexicality has also been noted by Steedman(1995).

Peirce (Peirce 1955) developed an elaborate typology of semiotic functions. It is the indexical function that connects a token of an indexical type to both the context (situation) in which it is used and the type (an element of the code) to which it belongs. Indexical sign vehicles (Silverstein 1992) point from the origin established by their occurring to some other point in the space established by the use of the token. This space is characterizable, depending on the semiotic ground (physical layout, sociocultural context, surrounding text etc.) established by the context, in an almost unlimited number of ways (Duranti and Goodwin 1992). Furthermore any particular characterization of the space is almost limitlessly defeasible depending on the discourse following the occurrence of the token (Silverstein 1992).

Some examples of the sort of phenomenon that I want to model are given below. It is necessary to both choose the appropriate set of fluents to represent the context or ground by which the indexical expressions are interpreted, and also to axiomatize the way in which these fluents are altered by various linguistic and non-linguistic actions.

Note in the following examples (from (Hanks 1992)) how varied the referents of *here* are.
1. *I'm over here!* (shouted to a companion through the woods) 2. *John lives over here, but we live here.* (pointing to a small map) 3. *Oh, it's just beautiful here!* (sweeping arm gesture to the countryside)
The referent of *here* is highly dependent on the context. This context is a result of the physical layout, previous actions (both verbal and physical) and concurrent physical actions.

As another example, consider the fact that the use of the pronoun *we* as opposed to *I* can establish that the speaker is taking an institutional (e.g. as the representative of an organization) rather than a personal role. This in turn can alter the interpretation of later utterances. See (Drew and Heritage 1992) for numerous examples. Also, as illustrated in great detail by (Wortham 1994) with data from high school classrooms, a teacher can act out a participant example by taking another role (e.g. of an ancient Greek). This in turn affects the interpretation of expressions (especially indexicals) that occur within the example.

Also, consider the following (taken from (Wortham

1994) who adapted the example from (Silverstein 1984)). B has just said that he lived in Iowa before comming to the University of Chicago.

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A: .....how do you like Chicago compared,
     did you go to school there or
         uh |=wa
B:             |=I did go to school there, I went
    to school here also, |=um um, so I came=
A:                       |=oh, uh-huh
B: =back kind of, I wa
A: oh, uh-huh, an' you
       went to undergraduate here or
B: in Chicago at, uh, Loyola
A: oh ... oh I'm an old Jesuit boy myself,
   |= unfortunately
B: |= oh are ya, where'd you go
A: Georgetown, down |=in Washington
B:                  |= o:h yeah, yeah
A: it's too bad I-
B: did you finish
A: um yeah well this is my second year here
B: oh uh |=huh
A:       |= and, uh, ....., it was nice,
      ..... this place is really ....
    .... I enjoyed the education there, ..
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The transcription is typical of that used in the ethnomethodological literature. As analyzed fully by (Silverstein 1984), the various uses of the deictics *there-then* and *here-now* set up a structure within the conversation. In line 11, B questions A about where he went to school. For A *then-there*$_{city}$-*there*$_{university}$ is Georgetown University in Washington,D.C. This is only interpretable on the basis of the previous pattern of deictic usages that alter the context or ground by which other deictic usages are interpreted.

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