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Authors

Airenti, Garbriella
Bara, Bruno G.
Colombetti, Marco

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THE ROLE OF INTERPERSONAL GAMES IN PERLOCUTIONARY ACTS

Gabriella Airenti*, Bruno G. Bara*, Marco Colombetti**

*Unità di ricerca di intelligenza artificiale, Università di Milano

**Progetto di intelligenza artificiale, Politecnico di Milano

Abstract

The analysis of perlocutionary acts is a fundamental component for a theory of human communication which accounts for the response of interacting subjects. We introduce two knowledge structures, namely games and contracts, which are used by the mental processes underlying perlocutionary acts. We present our model through the discussion of an example of game; in particular we focus on the problem of shifting from the wants of the actor to the wants of the partner.

1. Introduction

Cohen and Perrault (1979) and Perrault and Allen (1980) propose a formal model of illocutionary acts, based on speech act theory as developed by Searle (1969). Starting from these results, we suggest a model of perlocutionary acts in order to explain:
(i) how an actor A plans speech acts to obtain a specific response from a partner P, and (ii) how P decides to produce a response. Our interest here is with point (i).

Following Cohen and Perrault (1979) we assume that:
- A performs an illocutionary act whose effect is P's recognition of A's want that P performs a specific action π;
- a process called CAUSE-TO-WANT is triggered by the illocutionary effect and generates the perlocutionary effect that P wants to perform π.

The main point here is that the process CAUSE-TO-WANT actuates the transition from A's wants to P's wants. When both A and P are human systems, this transition deserves a further investigation. We claim that within a cognitive system a want can only be generated:
- by a knowledge structure of the kind of Schank and Abelson's life themes (1977);
- as a subwant of a previously existing want.
In the following we shall introduce two knowledge structures, namely games and contracts, as useful tools for a theory of human communication which provides for an adequate treatment of want generation.

2. Games in perlocution

The mental processes underlying perlocutionary acts make use of knowledge structures that we call contracts and games.

A contract is a cluster of actions involving two actors. When the contract is activated the two actors mutually assume the obligation to perform their roles (see Airenti, Bara and Colombetti, 1983).

A game describes the interactions of two actors (the players), as regulated by scripts within a specific context. The use of a game for planning perlocutionary acts will be illustrated by the following example, in which we reconstruct the process of plan formation of an actor A. Let us suppose that A wants to be driven to a location LC by a partner P; to fix the context, let us assume that A is a guest in P's house.

To reach his goal A must cause P to want to perform his role. We reduce such a CAUSE-TO-WANT action to: (i) three inferences, made possible by a script, a game and a theme; (ii) a CONVINCE action (see Fig. 1, where a slot-filler formalism has been adopted: symbols in capitals are constants, small single letters are variables).

The first inference is based on the script GIVE-A-LIFT; it leads to assume the driver's want, PARTICIPATE-IN-SCRIPT, as a condition of the driver's want DRIVE-VEHICLE. The use of a script in this kind of inference is that if an actor wants to participate in the script, then he wants to perform the action assigned to him in the script. The second inference is based on the game A-GUEST-P-HOST; it leads to assume P's want to PARTICIPATE-IN-GAME as a condition of P's want to PARTICIPATE-IN-SCRIPT. The introduction of the concept of game has the aim of providing a motivation for an actor to participate in a script within a specific context. Contrary to scripts, games are defined for two particular players. We assume a principle of interaction which represents the subjects' need of participating in interpersonal games. This principle is realized through the theme INTERACTION, which allows A to draw the third inference. This leads to assume A's want to PARTICIPATE-IN-GAME as a condition of P's want to do the same. The major point here is the shift from the actor's want to the partner's want.

The three inference steps lead to a formula which is the effect of a CONVINCE perlocutionary act, detailed in Fig. 2. We reduce the CONVINCE action to an inference and to the first action of the script GIVE-A-LIFT. The inference is made possible again by the game A-GUEST-P-HOST. Its meaning is that an actor is supposed to participate in a game if he manifests his intention to participate in a script belonging to that game, within its applicability context. Eventually, A's intention to participate in the script can be deduced from the fact that A performs the first action mentioned in the script (in this case the request). This amounts to assume that the execution of the first action counts for an opening move of the corresponding game.
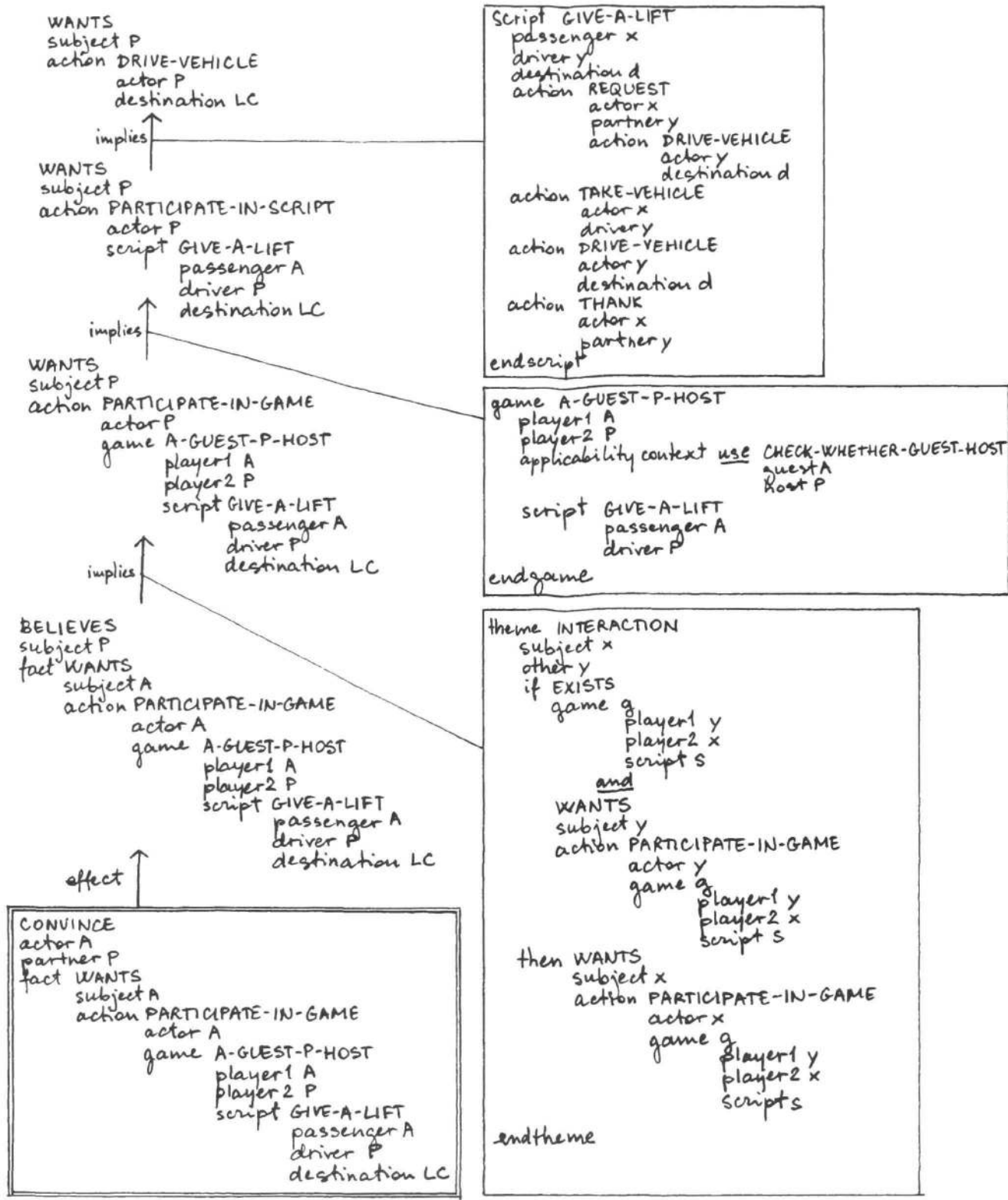
```
WANTS                              Script  GIVE-A-LIFT
subject P                             passenger x
action DRIVE-VEHICLE                  driver y
        actor P                       destination d
        destination LC                action REQUEST
                                              actor x
   implies                                    partner y
                                              action DRIVE-VEHICLE
WANTS                                                 actor y
subject P                                             destination d
action PARTICIPATE-IN-SCRIPT          action TAKE-VEHICLE
        actor P                               actor x
        script GIVE-A-LIFT                    driver y
               passenger A            action DRIVE-VEHICLE
               driver P                       actor y
               destination LC                 destination d
                                      action THANK
   implies                                    actor x
                                              partner y
WANTS                              endscript
subject P
action PARTICIPATE-IN-GAME
        actor P                     game A-GUEST-P-HOST
        game A-GUEST-P-HOST            player1 A
             player1 A                 player2 P
             player2 P                 applicability context use CHECK-WHETHER-GUEST-HOST
             script GIVE-A-LIFT                                    guest A
                    passenger A                                   Host P
                    driver P
                    destination LC       script GIVE-A-LIFT
                                                passenger A
   implies                                      driver P

BELIEVES                           endgame
subject P
fact WANTS
     subject A                     theme INTERACTION
     action PARTICIPATE-IN-GAME       subject x
            actor A                   other y
            game A-GUEST-P-HOST       if EXISTS
                 player1 A               game g
                 player2 P                    player1 y
                 script GIVE-A-LIFT           player2 x
                        passenger A           script s
                        driver P              and
                        destination LC     WANTS
                                           subject y
   effect                                  action PARTICIPATE-IN-GAME
                                                  actor y
CONVINCE                                          game g
actor A                                                player1 y
partner P                                              player2 x
fact WANTS                                             script s
     subject A                           then WANTS
     action PARTICIPATE-IN-GAME               subject x
            actor A                           action PARTICIPATE-IN-GAME
            game A-GUEST-P-HOST                       actor x
                 player1 A                            game g
                 player2 P                                 player1 y
                 script GIVE-A-LIFT                        player2 x
                        passenger A                        script s
                        driver P
                        destination LC   endtheme
```

Fig 1. The analysis of the CAUSE-TO-WANT action

The given analysis models the process used by A to plan a perlocutionary act through a game. The same result could be obtained via a shortcut by assuming that A's request directly generates P's want to perform the DRIVE-VEHICLE action. The full process is however necessary to account for:
- deceit: an actor may make the first move of the script in order to convince a partner to play his role, without having the intention to play his own role fully;
- failure recovery: when A executes his plan, a failure may occur at any point; the complete plan allows A to recover from the failure by partial replanning.

To give an example of failure recovery, let us suppose that the actor A receives no answer to his request; by using only the shortcut, A would have no possibility but giving up or repeating the same request. On the contrary, through the analysis of the complete plan given in Figs. 1 and 2, A is able to make a guess about the failure point, and to partially replan. Possible failures could occur in connection with any of the knowledge structures involved, namely the script, the game, the theme. For instance, A may assume that the script GIVE-A-LIFT is not part of the game A-GUEST-P-HOST for his partner P. In this case, A replans his perlocutionary act trying to replace the script GIVE-A-LIFT with another script associated to the same game or to a different one.
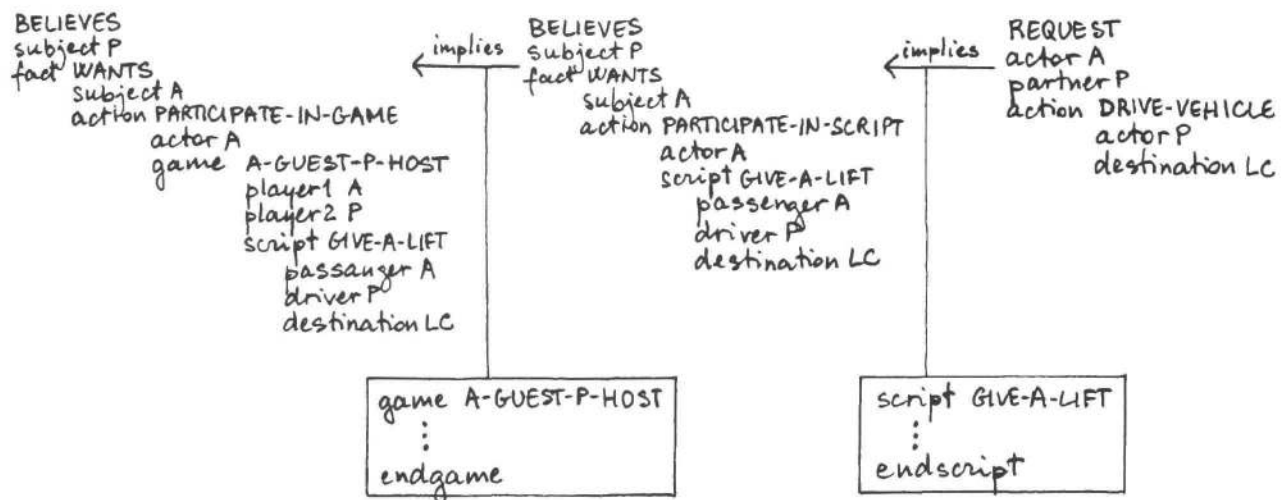


```
BELIEVES                          BELIEVES                          REQUEST
subject P          implies        subject P          implies        actor A
fact WANTS     <--------          fact WANTS     <--------          partner P
    subject A                         subject A                     action DRIVE-VEHICLE
    action PARTICIPATE-IN-GAME        action PARTICIPATE-IN-SCRIPT      actor P
       actor A                           actor A                        destination LC
       game A-GUEST-P-HOST               script GIVE-A-LIFT
          player1 A                         passenger A
          player2 P                         driver P
          script GIVE-A-LIFT                destination LC
             passanger A
             driver P
             destination LC

              +------------------------+      +-----------------------+
              | game A-GUEST-P-HOST     |      | script GIVE-A-LIFT     |
              | :                       |      | :                      |
              | endgame                 |      | endscript              |
              +------------------------+      +-----------------------+
```

Fig.2. The analysis of the CONVINCE action

3. Discussion

To explain how an actor plans speech acts to obtain a response from a partner is a relevant question for cognitive modelling. The model we present could serve as a basis for an artificial system able to plan perlocutionary acts taking into account possible failure recoveries and deceits.

Moreover, our proposal seems to provide a first psychologically adequate explanation of the cognitive processes necessarily involved in the production of perlocutionary acts. In particular, we believe that a knowledge structure like the game is needed to explain the transition from an actor's want that a partner performs an action π to the partner's want to perform π. Such a transition has been reconducted to a basic principle of interaction, which is assumed to provide for the motivation of action.

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