

Principle 2 : Level of demand and concession during the negotiation

We defined the behaviors for the second principles, using the work of (DeDreu, 1995). In his work, he investigates the impact of social value orientations on the behavior of prosocial vs competitor negotiators. The major purpose was to answer four main hypotheses:

1. Prosocial will have lower level of demand and concede more than individualist and competitor negotiators. (i.e. greater level of yielding)
2. The difference of prosocial VS competitor behaviors exists from the beginning of the negotiation or emerge during the negotiation.
3. Negotiators engage in logrolling in order to predict a main effect of **issue priority**, with lower level of demand and greater concession than for high priority issue.
4. Prosocials tend to project greater cooperative intentions toward other than do competitive and individualist.

This behaviors can be related to our work, in terms of prosocials are more submissive than individualist negotiators who tends to be more dominant in the negotiation.

Series of study were conduct in order to confirm theses hypotheses. Here the main results:

A significant difference was found between the level of demand of prosocials and individualist negotiation, showing that prosocials place lower level of demand than individualists. Moreover, prosocials demanded the same as individualists for the first two turns. However, former show a decline of demand after in the negotiation, which proves that the difference of behaviors emerge during the negotiation. Prosocial showed a lower demands in the low priority issue which triggered in the end that the level of demand decline over time especially for prosocial negotiators. Finally, they showed that negotiators engage in logrolling by making greater concessions and placing lower demands on low-priority issues than on higher priority. Furthermore, prosocials viewed themselves as being more concerned with the other's well-being while competitors were more concerned with their own well-being.

Looking back to this paper, we can extract the following behaviors for our model of negotiation:

- a. Dominant agents are more demanding than the submissive agents
- b. Level of demands for submissive agents decrease over time.
- c. Submissive agent gives a lower level of demand to low priority issue.
- d. Submissive agent consider well-being of other in the negotiation, whereas dominant agent are only interested in their own well-being.

Implemented behaviors related to principle 2:

We already implemented some of these behaviors in our model of negotiation:

- a. Level of demand: We implemented a function "isAcceptable(value)" that computes if a value is acceptable with respect of the agent preferences. Dominant agents are very restrictive with their preferences, whereas submissive agents are not. (See the algorithm for more details).
- b. Level of demands for submissive agents decrease over time, is simplified to make the submissive agent accept any proposal if the negotiation is about to end (the maximum number of turn talk is nearly reached).

- c. Considering well-being of the other during the negotiation: submissive agents make proposals that aims to satisfy both agent's preferences. Using his partial knowledge about other, he computes other acceptable values, and propose the first one which is also acceptable for him.
- d. A dominant agent proposes only **acceptable** values.

Improving behaviors in the model of negotiation

1. Increase the number of talk turn to at least 20 in order to make the difference behaviors appears in the dialogue.
2. Add more values to the preference model of restaurants. For example, in the D1 model, only Chinese cuisine is acceptable for the dominant agent. Moreover, Cost and ambience have only two values. This lack of values make the negotiation very poor.
3. Improve the model with the notion of low priority issue. In our model, we defined the notion of **rank** which defines the importance of the criterion in choosing a restaurant. I propose thus, to make submissive agents having less demands concerning criteria with a low rank and accepts a value if its criterion type is not important for the agent.
4. The way that level of demand for the submissive agent decrease in the negotiation is too simple. I propose to modify the algorithm in order to make the submissive agent more flexible.
5. Finally, the last improvement concerns the third principle. When designing the notion of leading the dialogue, I proposed that instead of rejecting a non-acceptable proposal, the submissive agent states why he cannot accept it. This behavior is implemented following scholars that state that submissive or dependent interlocutors tend to justify their actions or behaviors in the dialogue. However, due to the simplicity of our utterances, submissive rejection in the current implementation is mainly perceived as high behavior of dominance. Therefore, I propose to remove the statePreference after a propose, and adapt the utterance of reject in function of the relation of dominance. Thus, if the agent is dominant:
 - a. Dominant agent rejection : "I'd rather go to another restaurant"
 - b. Peer agent "Sorry, but I'd rather choose something else" (unchanged)
 - c. Submissive agent "Sorry, I can't go to this restaurant, because I don't like X. X is either a proposed value if it's a criterion, or the leastScoredValue of the restaurant X.