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## Rational Inefficient Compromises in Negotiation

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## **Abstract**

It has often been assumed that rational negotiators who achieve inefficient compromises should accept Pareto improvements suggested by some external party, such as an expert, mediator, or a computer system. Following this assumption an argument is made to give legitimacy to efficient compromises generated by a negotiation support system or to entice a party move to a Pareto improvement. The simplifications made in model construction on the one hand and the very narrow and limited considerations of rationality in present negotiation support systems on the other, suggest a different approach to support. This approach is based on engaging users to a sound process and confronting them with their inconsistencies rather than providing solutions or promoting improvements.

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## 1. Introduction

Korhonen, Phillips, Teich and Wallenius (1998), in their letter to the Editor, observe that people are often not willing to improve the compromises they have achieved through negotiations and provide some possible explanations and remedies. In this note we attempt to address several concerns raised in the letter and point the reader to relevant literature. Acceptance of inefficient compromises has been researched from different perspectives as we note in Section 2. There are many possible explanations and some of them are presented in Sections 3 and 4. The type of experiment that has been used may also provide some insights as indicated in Section 5. Implications for decision and negotiation support are briefly discussed in Section 6 and a brief conclusion in Section 7.

## 2. Evidences for inefficient compromises

The acceptance of inefficient compromises and the unwillingness to improve them are phenomena that have been observed in many experiments (see, for example, Alemi, Fos et al. 1990; Prasnikar and Roth 1992; Roth 1995; Weingart 1996). Different interpretations are plausible and have been formulated on both the theoretical ground (McClennen 1990; Varoufakis 1991; Kersten and Noronha 1998), as well as behavioural and experiential. The latter includes widely published observations about cognitive biases and limitations (Bazerman and Neale 1991; Neal and Bazerman 1991), but also differences in peoples approach to, and understanding of, decision and negotiation processes, and what constitutes an outcome of these processes (Adler and Graham 1989; Hofstede 1989; Faure and Rubin 1993).

Since 1996 we have been conducting a large experiment on analyzing bilateral negotiations between people from many cultures and with different educational and professional backgrounds (Kersten and Noronha 1997). The negotiators use INSPIRE, a Web-based NSS that allows for anonymous negotiation with the use of conjoint analysis for utility construction, a messaging facility for argumentation, and a visualization facility for the construction of a graph representing negotiation dynamics and history (Kersten and Noronha 1997). Between December 1996 and March 1998 over 1000 people negotiated via INSPIRE; some 59% achieved a compromise and out of them

only 46% achieved an efficient (Pareto-optimal) compromise. INSPIRE suggests Pareto-improvements to the users who achieved a non-efficient compromise by displaying up to five efficient compromises and invites users to continue negotiations. Out of those who achieved non-efficient compromise only 18% wished to continue and improve their results. That is, 82% of those who achieved an inefficient compromise did not want to improve it.

There are several suggested reasons for negotiators not to prefer Pareto-improvements (Korhonen, Phillips et al. 1998). These include the issue of fairness that has been discussed in experimental economics (Bartos, Tietz et al. 1983; Tietz and Bartos 1983; Thompson and Loewenstein 1992) and a possible dislike or distrust of a computer generated outcome. This, in effect, may—according to the authors—provide an explanation for the rejection of inefficient compromises:

“Technically speaking, these outside considerations could be interpreted as underlying issues for the parties. Hence in the augmented space of issues, their original settlement may, after all, have been Pareto optimal.” (Korhonen, Phillips et al. 1998, p.2)

This statement may be critical to the discussion on inefficient compromises and also to many discussions conducted in the MCDM/MCDA community including the MCDA Manifesto (Bouyssou et al., 1993). Paradoxically, this statement may be seen as one answer to all the questions posed by researchers who observe deviations from efficient solutions and are uncomfortable, for some reason, with these deviations. This is because if subjects (decision makers, negotiators) can provide any explanation a posteriori for the selection of a particular compromise then the issue space can be modified so that this compromise is efficient.

Korhonen et al. (1998) suggestion that the rejection of Pareto-improvements may be countered with the introduction of an expert or a third party who designs an appropriate incentive to steer the discussion into new directions. This is because an expert or a third party changes both the context and the dynamics of the process and thus makes the outcomes incomparable with a situation when none of them are present. It is these context-dependent attributes that are critical but neglected issues in decision making.

### 3. Context-dependent attributes

Augmentation of the issue space is a phenomenon that often happens in negotiations when some attributes (issues) are *context dependent*. These are the attributes that describe the decision maker. They may be viewed criteria or soft constraints that are related to the problem, process or the “world outside of the problem”. Examples of these attributes are fairness, time pressure, social status, and empathy.

French (1986, p.344), states that:

“The construction of the model decision maker as a reflection of me enables me to explore and clarify my preferences and beliefs. Indeed, in many cases it guides their evolution in that it encourages me to think about aspects of the problem which hitherto I had not considered and, therefore, about which I have no pre-existing feelings. ... As I articulate my initial preferences and beliefs during the construction of the model decision maker, my attention is drawn to any inconsistency between these and the canons of rationality.”

The difference between the making of a single decision and negotiation is that in the latter the preference articulation is revisited and attributes that at one point were not relevant may later become critical.

The consideration of context-dependent attributes before the negotiation commences may make little sense to the decision maker. This is because these attributes may become present only in certain situations that are difficult to foresee and they need not be related to the negotiation problem but to the personal and/or professional characteristics of the negotiator. For example, a person may be distrustful of computers in general, but the very fact that she agrees to negotiate using them implies their acceptance. Only when and after a difficult negotiation the system proposes another solution the distrust may resurface.

Context-dependent attributes are intrinsically linked with the situation in which one or more negotiating parties find themselves. Assuming, for simplicity, that the negotiation situation is described--at any point in time--only by attribute values and preferences, we obtain that the value of a context-dependent attribute depends on other attribute values. This implies that for negotiators it may be cognitively very difficult, if at all possible, to specify the attribute and its salient levels (e.g., reservation levels) without experiencing other attribute values. A person may clearly want to achieve a compromise that is fair for both sides. We may also assume that, for a given problem, she is able to specify the attributes on which fairness is defined. However, it may be impossible to define a functional relationship between these attributes. This is because this person may be able to define fairness only locally, i.e., for a given configuration of the values of other attributes.

Decision making in general and negotiation in particular is a problem solving activity (i.e., the choice of a decision) and a process involving resources and effort. Context dependent attributes may depend on the process and its attributes and not solely on the problem (alternatives) attributes. For example, fairness attribute may depend on the initial openings (offers) made by both parties, the frequency of counter-offers, and the concessions made by each side.

From the above examples it follows that context dependent attributes may reflect psychological traits of decision makers and their belief and value systems. It is not often that people change these traits and values and here we are not concerned with such significant issues as learning and discovery. These traits however, are present but not necessarily prominent. That is they play a role when a situation calls for it but may not be visible in other situations.

## 4. Rationality

Korhonen et al. (1998) speculations that people through gaining work experience or obtaining higher education are more likely to accept a Pareto improvement seem to have its underlying reasons in their strive for economic rationality. Their axiom is--it appears--that economic rationality is a principle which people should apply in making decisions. The corollary is that by rejecting *Pareto improvements* people violate the *rationality principle* or vice versa. Rational negotiators have to reject a compromise they have achieved and accept an alternative that yields higher utility value at least for one of them. If they reject such an offer (suggested by a computer, mediator or third party) they cannot be rational. We argue that this is not necessarily the case and that in fact the

two concepts are only loosely related, and that they are valid principles for decision making other than economic rationality.

According to Savage (1972), a rational decision maker is one who:

... has only one decision to make in his whole life. He must, namely, decide how to live, and this he might in principle do once and for all.

Decision scientists following and including Savage have rightfully deemed *this grand-world* problem unrealistic. Instead they focus on episodes; local and partial decisions that they assume can be reasonably isolated from the reminder of the decision maker's lifetime of activity.

Since the most comprehensive criteria of rationality are expressed in terms of grand-world problems, assessing the rationality of any individual (local) decision problem is not an easy task. In many situations it cannot be reduced to the consideration of the attributes of the decision problem and the preferences of the decision maker defined on these attributes. This is the case with many decision made in social settings when people interact and the results of these interactions have consequences beyond that episode. Negotiations are a typical example of such decisions. One should not be surprised that only rarely they can be isolated from the decision maker's past and her/his projection of the future.

In abstract, someone in agreement with the rationality principle means that she is coherent with the principles she has chosen and applies in life. This coherence is the essence of rationality (Wellman, 1995), as it links the many different and partial decisions into one life-spanning decision. Coherence means that local decisions are not contradictory with each other. Thus, employing the rationality principle may be interpreted as using some *global criteria* in decision making.

The rejection of Pareto improvements implies that a person rejects a solution for which some *local criteria* values are better than the solution accepted. Since it is the global criteria that determine whether a person is rational, rejection of Pareto improvements has little impact on rationality principle if at all.

It could be argued that a rational decision maker should formulate all criteria, including global criteria, that are relevant to the problem at hand *prior* to choosing an alternative decision. This may well be possible in narrow and well-defined problems, but it is hardly possible in cognitively difficult problems that involve interactions between people.

Consider a person who is and wants to be seen as being compassionate, and who is entering a negotiation. She is asked by a decision analyst about the negotiation problem, including decision attributes, criteria, reservation prices, BATNA, etc. All these questions are posed in a social and historical vacuum. Being compassionate does not enter the picture at all. However, when she interacts with her opponent and formulates concessions, compassion may become an important criterion. Consequently, she may make a very different decision than the one the decision analyst could foresee. For that expert, the negotiator is not rational; she makes decisions violating earlier stated criteria and possibly reservation prices or BATNA. People who know her well, however, see her as being a rational decision maker. What is more, if she were to follow the analyst's advice, they would see her as being irrational. This is because she would then be violating one of her own and accepted global values.



## 5. Experimenter and subject

Results of contextually relevant experiments, as the one proposed by Korhonen et al. (1998) may be misleading. This is because they introduce context that is designed and interpreted by experimenters but which may be perceived very differently by the subjects. Behavioural, cultural and moral constraints and criteria may play roles that were not recognized by the experimenter. For example, it is possible that some subjects were uncomfortable with the idea of buying course credit points with Swiss chocolates or dollars.

Assume that you feel pressured and therefore participate in negotiation. You believe that once you have achieved a compromise the contract is fulfilled and you can do other things. Now, you have achieved a compromise and are asked if you would rather choose another alternative. The point is that while this new alternative may be better you may want to finish the experiment as quickly as possible and for a variety of reasons. It has been shown both experimentally and theoretically that time and outside options have significant impact on negotiations (Rapoport, et al., 1995).

Setting contextually relevant negotiation experiments poses a danger that the negotiation problem is considered relevant by the experimenter but not by the negotiating subjects. Allowing the subjects to retain the negotiation settlement may also pose the relevancy problem. For these reasons many negotiation experiments use either an abstract problem or a case in which the subjects represent an organization. The subjects may still be rewarded and the gains may depend on the compromise or lack of thereof (Roth 1995).

## 6. Decision support

For years decision and negotiation support was done only via intermediaries; in-house analysts or consultants. This was obvious when there were only a few computers; the computer systems were difficult to use and the methods for decision analysis and evaluation were not suitable to be used by decision makers (Finlay and Martin 1988). Over the last few years, however, both methods and systems have changed; researchers and system developers have made efforts to deliver DSS to decision makers. Despite these efforts and contrary to the definitions of DSS, typically there is an intermediary between a DSS and the decision maker (Anghern 1993; El-Najdawi and Stylianou 1993; Finlay 1994). Perhaps the reasons for this situation may be found in a narrow consideration of the role of support and in the interests of the intermediaries.

An intermediary is expected to learn not only about the decision problem but also the decision maker and situation they face. The intermediary should not only be able to help to select decision attributes, constraints, criteria, but also be competent in suggesting what rationality principles to adopt. Construction and fine tuning of the model were the obvious activities of the intermediary. However, they were also able to interpret the solutions and discuss them and their implications with the decision maker. This process led to the intermediary's learning of who the decision maker is and what their needs are both now and in the future. This leads to further fine tuning of the model so that it not only described the decision problem but also incorporated certain salient characteristics of the decision maker. Consequently, an efficient solution of the initial problem might become infeasible and an inefficient solution may become efficient.

If DSS were to be widely used by end users, that is if they were to support real decision makers then the mode and role of support will have to change. The constructors of methods and systems have to realize that they provide only very narrow and localized support, and that their role is to build tools that help the users to understand the problem and themselves. These tools need to provide *support for the process* of decision making and not for solving decision problems. They need to be active participants in the process (Anghern 1993; Rao, Sridhar et al. 1994). The main difference is the acknowledgement that the user is the customer whose needs should be satisfied and that although the system may be missing a significant portion of relevant information its utility is in supporting the user. In that sense the objective of support is not to provide a solution and much less in trying to direct the user into any specific solution. Instead, it is to allow the user to compare solutions, construct scenario, easily modify problem representation, and manage the decision process. In that sense the expectation is that the system engages its user in a sound process, confronts him with his inconsistencies and contradictions rather than providing a quick and easy solution. This view of the role of a DSS or NSS is in line with Henig and Buchanan's (1996) request to upgrade MCDM methods.

## 7. Conclusion

While we concur on the salience of the issues raised by Korhonen et al. (1998), we have argued for a very different role for the "expert" in DSS and NSS. We see the role as being more to help the negotiator/decision-maker to understand the problem and themselves. In contrast Korhonen, Phillips, Teich and Wallenius suggest a role based more on giving legitimacy to efficient compromises generated by DSS or NSS or to "design incentives to entice a party move to a Pareto improvement". We see the clear need for support that engages the user rather than one of promoting solutions.

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