# Conflict Resolution and Group Decision-Making

Exploring the dynamics of conflict resolution at the group level

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## Abstract

Conflict resolution in decision-making groups is studied using a System Dynamics model. The model is developed using a grounded-theory approach. Some preliminary results are shown. The results seem to be in line with much empirical research done in the management literature about conflict and conflict resolution at the group level of analysis. Ideas for further research are discussed.

## Introduction

The dynamics of group decision-making have been a major research theme in many fields of inquiry, from economics, to organizational theory, to operations research. Such research is of great importance. It is not difficult to imagine instances in which important decisions are the result of individuals interacting within a group. Such occurrences can take place at the societal level, for instance when a country decides to wage war on other countries, or at the firm level, for instance when a firm decides how it will wage war to other firms in the market place. Understanding the dynamics of how groups make such decisions is clearly of utmost importance.

This notwithstanding, much of our understanding of the collective entities in which we are immersed, firms and societies at large, is based upon the analysis of choice behavior of individuals. Such behavior, be it that of a rational individual or the ways of a bounded-rational one, is, by and large, extrapolated to explain the choice behavior of groups of individuals. This, of course, can be simple and elegant. Yet, one cannot help but think that at the level of the firm decisions are not made by rational (or bounded-rational) individuals acting alone. Teams are pervasive and we live the results of their decisions. One, hence, should devote some effort not only to study the rationality (or not) and the dynamics of individuals making decisions, but the rationality (or not) of individuals making decisions amid other individuals making decisions with them.

To the reader this will probably sound boringly recurring. After all, a brief inquiry into the field of group research suffices to show that scholars have amassed much work concerning the issue of group processes. Economists, for instance, have looked at the choice behavior of consumers when those individuals have diverse and often conflicting preferences. Arrow's (1951) impossibility theorem started the field of social choice theory, a rich set of literature that deals with the conditions and choice of alternative social possibilities.

Organizational theorists and social psychologists have also extensively looked at groups and their workings. Some authors have focused on structural aspects of groups (Feldman, 1984, for instance), others on demographic issues within groups (Wagner, Pfeffer, and O'Reilly, 1984), or even at certain dynamic aspects of group evolution over time (Gersick, 1988; Tuckman (1965). This vast literature, if one were to somehow organize it, could be said to follow into three large categories. In the first category we find work that looks at the inputs to the group decision-making processes. Here, researchers attempt to find connections between the ways groups are structured, for instance in size or demographic composition, and their performance. In another category we have work that looks at the process of decision-making itself, that is the ways discussions go within groups. In a third category we find outcomes and measures of efficiency of group activities.

One issue that remains puzzling, to say the least, is the role conflict plays in group processes. And I say puzzling because no apparent agreement is found in the literature regarding its effects upon the way groups decide, or about the outcomes of such decisions themselves. On the one hand there are instances that point to conflict being detrimental and resulting in groups failing to make a decision (or in making one that is clearly inferior to others that were available). Conflict, in such instances, is dysfunctional, and it conveys negative effects to the process of decision-making (Amason, 1996). In many instances conflict is associated with reduced productivity and satisfaction in groups (Gladstein, 1984). Yet the lack of conflict, on the other hand, seems to also be problematic. In its absence, groups become too cohesive and its members avoid dissension. Alternatives are not adequately explored, and groups, acting as if possessed of a common and single mind, become obsessed with certain decisions that prove later, often at much cost, to be utter nonsense. This is what Janis (1972) termed "groupthink", a condition that causes groups to operate within ineffective problem-solving processes and make poor decisions. But there is more. The absence of conflict, or disagreement to be precise, has been found to be related to increased performance at the group and organizational levels (Bourgeois, 1980), and the presence of conflict has also been related to improved decision quality and even to organizational growth (Schweiger et al., 1989). So… which is it?

These contradictions have not really been sorted out in the literature. Only one thing appears to be clear: that conflict does play a role, and an important one, in decision-making groups and organizations. How it plays its role though, is something apparently yet to be unraveled. To this end, and since not much long ago, some journal editors have encouraged authors to (Mannix, 2003: 543) "…generate creative ideas about seemingly

familiar phenomena, the goal of which is to provoke some controversy and, thus, to spark some new insights leading to an expansion of our knowledge" (about the role conflict plays in groups and organizations, of course) and "…toward theorizing that includes temporal and dynamic processes."

The goal of this paper is to explore alternative ways to understand such complexity and, perhaps, in some small way, generate, as Mannix (2003) demands, some ideas to look at conflict within decision-making groups. At this stage this work is in progress and only the preliminary results are presented here.

## Conflict resolution and information processing

To be precise about what we are talking about here, some definitions and clarifications are required. We are interested in the phenomenon of conflict resolution within decision-making groups. This means we want to look at the ways members of groups go about resolving their differences in order to choose an alternative.

The distinction is important because the literature shows many variants of the construct conflict. There is, for instance, cognitive conflict, which is related to the task. This happens when groups get into disagreement over how objectives will be achieved. Organizational theorists also talk about affective conflict. This is the conflict that arises because of personal issues of incompatibility.

What we are dealing with here is a somewhat more economical view of the issue. We are concerned of course, with the conflict that ensues when there is no agreement about the uncertainties surrounding the group and when members of the group do not agree upon what would be good for it. But our concern is somewhat limited: we want to explore how groups go about resolving the conflict that arises when its members, operating within a time constraint, have conflicting preferences over a set of alternatives. Put simply, how do groups decide when there is a large set of possible alternatives and not enough time to find out which one is (objectively) the best one? In such a setting, if the consequences of the group decision are binding for the individual, he will have a very strong incentive to have his own view, what he thinks is best for the group, prevail. He will, then, do all he can in order to have his own preference chosen by the group.

With the problem so defined, conflict, for all practical purposes, becomes the degree of discrepancy among the different alternatives embraced by each group member at the outset of the decision-making process. Moreover, conflict resolution becomes the process by which such discrepancies are reduced and, eventually, eliminated, to the point where one that is satisfactory to the majority of the group is chosen.

Also, with the process of conflict resolution so delimited, one can then think of how, within groups, such discrepancies are eliminated. The more obvious process is one of each member arguing for his preferred alternative. To argue, the group member has to process informational cues. With such information, each group member defends and

supports his position in a manner as coherent and convincing as possible[1]. Thus, in order to resolve conflicts, as defined here, groups trigger processes of information-seeking, and group members engage in discussions before choosing an alternative.

In the above summarily described literature, however, conflict is mostly dealt with as an isolated construct. Much work defines different types of conflict and then endeavors to find correlates to measures of performance at the group level, but it does not establish any sort of relationship between conflict resolution and the necessary processes of information search that need accompany it. We posit here that information processing and conflict resolution are interdependent activities. The first one is concerned with the latter through a process of discussion and argument in which each team member uses information in order to convince others of the virtues of his choice. Yet, though these activities are interdependent, they do not occur at the same time. Individuals cannot argue, bargain, and haggle and process information simultaneously. One thing attenuates, if not precludes, the other.[2]

When defined thus, conflict within groups arises because the group has to make a decision, choose an alternative, in the midst of disagreement between group members about which is best for the group. Thus, conflict resolution becomes the process by which each individual member alternatively engages in processing information and using such information for bargaining with the other group members.

## Methods

To study the role of conflict and conflict resolution within decision-making groups, we developed a formal, mathematical, model using the system dynamics methodology. We did not arrive at our model by means of a deductive procedure, as is often done in much work in the social sciences, but following an inductive path. We reviewed the literature on conflict and conflict resolution, both at the organizational and group levels of analysis, and from the most representative work in this field we derived general ideas that were integrated into a more general representation. The idea is to provide a model with explanatory power that will, at the same time, permit organizing some of the more salient results observed in the literature.

## Model Structure

The basic idea behind our model of group decision-making and conflict resolution at the group level is that individual group members engage in information processing and in bargaining activities. When processing information the individual group member gathers

[1] Much literature has explored this issue. Levin et al., 2000, for example, explore how information is processed during successive stages of group development.

[2] Much literature in the area of attention and cognition supports this notion (e.g., Coles, 1974). Bower and Clapper (1989), for instance, indicate that "…a broad range of cognitive performances is powerfully influenced by the extent to which subjects attend to the task at hand. As subjects "pay more attention" to a given task they usually perform it better."

information from the environment, makes sense of this information, and translates it into what we could term "coherent arguments.' Information is, through this procedure, changed from a state of disarray to one of order. Through this process information becomes suitable of being used for arguing. When arguing, individuals use the information they have processed to attempt convincing the other group members that their chosen alternatives are the best[3].

If there were no bargaining, the stock of information processed would grow indefinitely at the rate at which the individual is capable of processing it. The amount of information processed over time would look like the graph shown in figure 1a. If, however, there were no new information processing, and all processed information available were used for bargaining, the amount of processed information available would behave, over time, as shown in fig. 1.b.

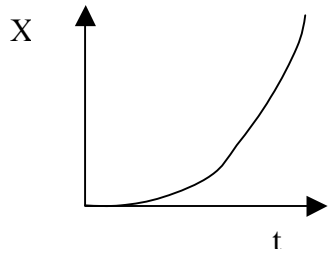


Fig 1. a

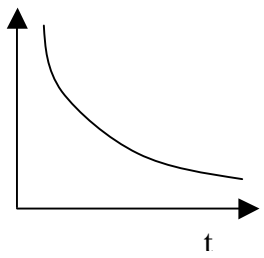


Fig 1.b

Figure 1: Behavior of Information processed

These behaviors do not happen because information-processing and bargaining activities interact. Thus, when no bargaining is necessary, the individual centers his attention on processing more information, and vice versa. One could specify such a system by specifying two state variables. One is the quantity of information processed that is accumulating, the other the quantity of information that can be used for bargaining. The first one does not grow indefinitely because it is depleted, through some function, and sent to be used for bargaining; while the former never decays to zero because it is replenished, through some function, by the processing of new information. However, because both processes do not occur simultaneously, as one becomes predominant, the other one diminishes. Mathematically this would look like:

$$\frac{dx}{dt} = a_1 x - F_1(x, y)$$

$$\frac{dy}{dt} = -b_1 y - F_2(x, y)$$

[3] Of course if no conflict is present, i.e., no significant difference exists among group members' individual perceptions about alternatives and fact, a solution will readily be chosen.

Where dx/dt is the change over time of the stock of information processed, dy/dt is the change over time of the stock of "bargainable" information, $F_1$ and $F_2$ are some functions, and $a_1$ and $b_1$ are parameters.

Following this, we specified a System Dynamics model that is partially shown in figure 2.

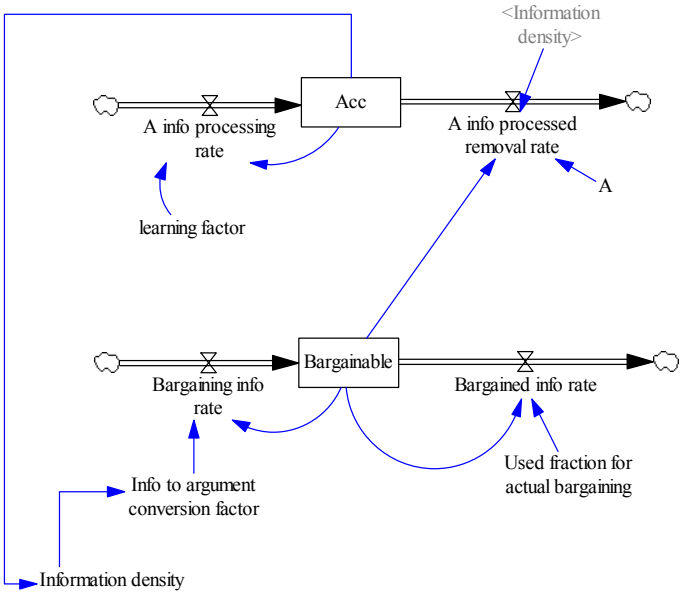


Figure 2. A partial view of simulation model

In this model we specified identical functional forms for $F_1$ and $F_2$. When an individual uses 'Bargainable' information[4], this stock of information is replenished by translating the accumulated already processed information into 'bargainable' information.

The behavior of both stocks of information is as shown in figure 3. We can see that these repositories of information move somewhat counter cyclically, in a fashion that mimics our intended impossibility of performing bargaining and information processing simultaneously.

[4] Moved by a STEP function or by a decaying probability of prevailing.

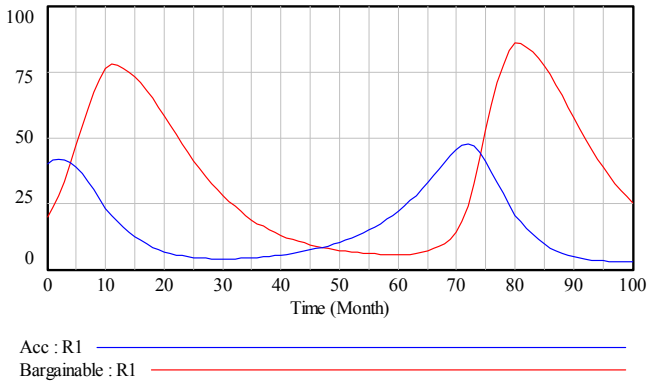


Figure 3. Model behavior

We then constructed a model of a group by interlocking structures similar to the one shown in figure 2. Our final model had three identical 'individuals' behaving in a fashion similar to the one shown in Figure 3. We then used this basic model to set up a "virtual experiment." The idea was to examine the dynamics of group decision-making when conflict was present. Thus, we defined an arbitrarily large set of plausible alternatives (a value in the interval between 1 and 1000) and also arbitrarily defined an optimal value at 500. We then randomly assigned a value to an 'initial choice' variable for each 'individual'. This value was in the interval described. The rationale being that the optimal value could not be known before hand, and sufficient time was required to determine it, hence the value had to be chosen heuristically (by the person). The geometric distance between these initial choices was a measure of conflict. The process of coming up with a solution was the process of conflict resolution. The 'individuals' in the model process information and use it for bargaining, as described above. Moreover, when information is processed, learning occurs, and each subjects' choice is moved toward the best value at a certain rate. We stopped the model whenever two choices evolved to within 1 unit of each other (i.e., a majority rule). In our final model, we induced bargaining whenever the probability of an individual choice[5] fell outside an arbitrary minimum.

**Base model.**

We first performed twenty runs departing from different sets of arbitrary initial choice values for each of the 'individuals' in the group. The idea of the base run was to examine basic model behavior. Figure 5 shows the levels of conflict[6] the 'groups' started from in the sample of runs. The levels of conflict are shown graphed against themselves. The mean is 632 and the standard deviation 347.

[5] Which we simply made proportional to the 'accumulated' bargained information
[6] i.e., the geometric distance between the initial choices.

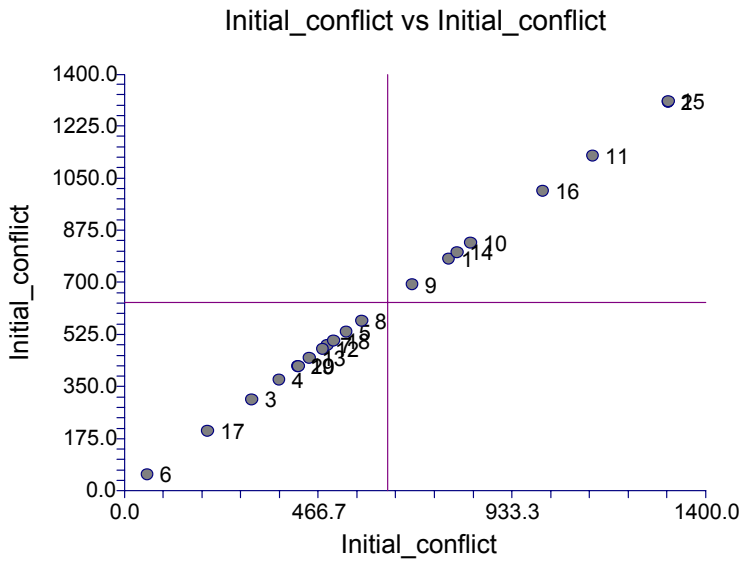


Figure 5. Conflict levels in sample of runs.

Figure 6 shows that to arrive at a solution, it took longer for those groups with larger levels of conflict. This supports the idea that conflict induces longer processes of deliberation and information search.

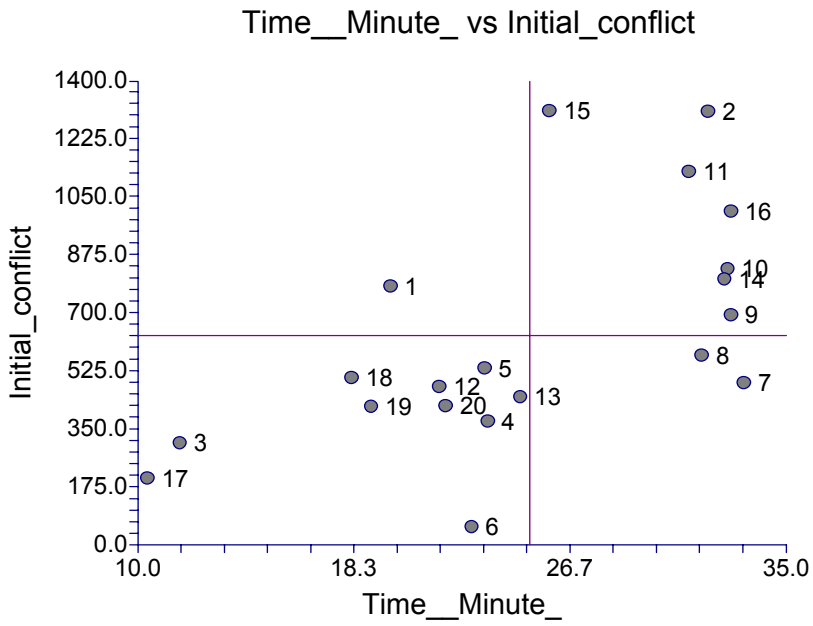


Figure 6. Initial conflict versus time to select an alternative.

The quality of the decisions, however, measured by the geometric distance of the final group decision locus with respect to the optimal value, varies. Figure 7 shows that the groups, but a few, came very close to the optimal value.

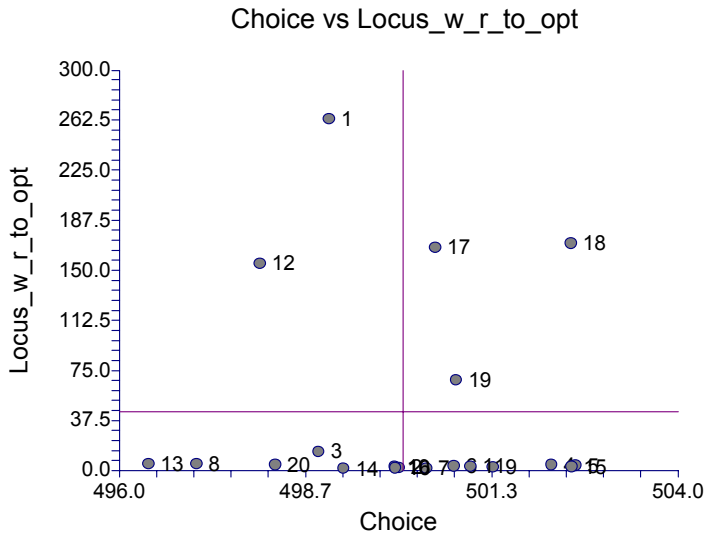


Figure 7. Distance between optimal value and group decision locus at end of run.

The groups that landed furthest from the optimal value were groups that had a low, mostly below average, conflict level at the outset. Because conflict level was so low, a decision was made without exploring much further. This is shown in Figure 8

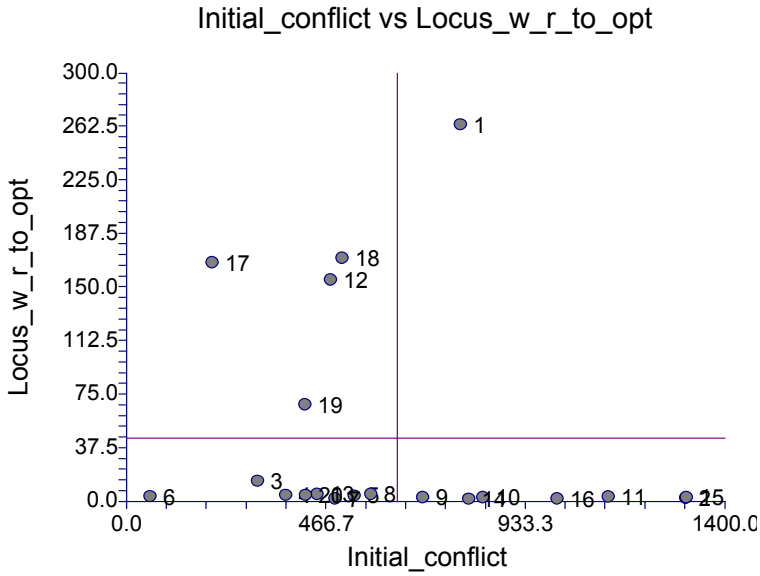


Figure 8. Locus of group decision, measured as the geometric distance to the optimal value, and level of initial conflict.

As Shown in Figure 9, those groups that started with large initial conflict levels were also those that, as expected, took more time to reach an agreement. This is in line with the idea of conflict serving the purpose of evaluating more alternatives, but it is also inefficient. Should the simulation had been run with a tighter time constraint, many groups would have failed to reach an agreement. In other words, the inability to resolve conflict within a given time constraint causes the group not to reach a decision. If such had been the case, conflict would have been dysfunctional.

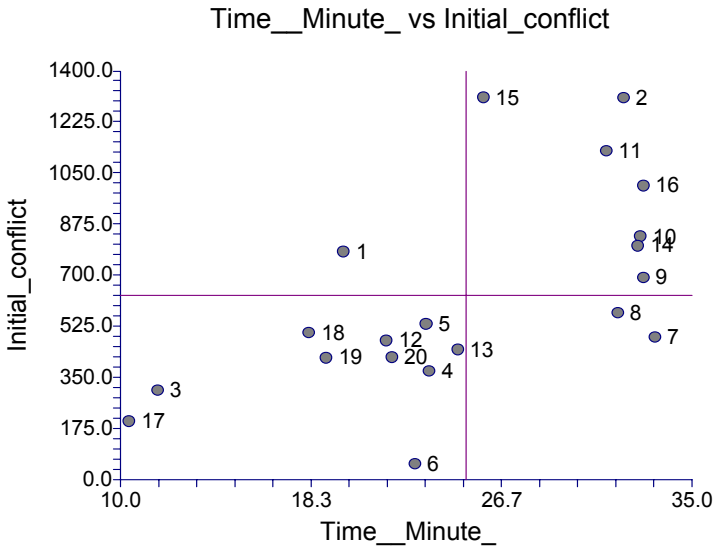


Figure 9. Initial conflict vs. time to reach agreement.

## Conclusion

The preliminary results of the base model shown above seem to be in line and adequately illustrate much research found in the literature of groups and conflict in groups. This gives us confidence in our grounded theory approach. In constructing the model we provide two contributions. First, we highlight the interaction between conflict resolution and information processing. More elaboration is needed, but at the outset it seems the idea has solid grounding in the psychology literature and appears to help understanding the dynamics of conflict in groups. The second contribution provided here, which merits more discussion, is the introduction of time in the analysis of group decision-making and conflict resolution within groups.

The work presented here has, at this stage, many limitations. The model needs to be refined and calibrated, preferably using real-life experimental data. It is possible that a more elegant and neater model, using only one state variable per individual is feasible.

Doing so might lend the modeling of group behavior to answer many interesting questions. For instance, what happens if there are information asymmetries? In our base model we modeled all individuals within the group with identical initial quantities of processed and 'bargainable' information. It would also be interesting to explore social influences, for example people being more influential for some reason, such as tenure or age, by simply assigning a higher conversion factor from information processed to 'bargainable' information. Herd behavior could be explored by using non-linear accumulation of 'posted bargains'.

Though much work remains to be done, we believe the ideas presented here could be an interesting alternative way of looking at conflict resolution at the group level.

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