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## Group Decision Making

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# Recent Research on Group Decision Making

Hermann Brandstätter

Group decision making has been praised as a panacea to overcome increasing task complexity, to solve social conflicts, and to secure cooperation. Others have warned against the loss of time and effort on problems that are better handled by individuals, or against the deleterious effects of "group think" on decision quality. Research on group decision making has often been stimulated by practical problems and some of its findings may be useful in improving group problem solving within organizations. But more than for its social relevance, this research deserves attention for its potential for developing a social psychological theory of inter-personal behaviour.

Conceiving of "Group Decision Making" as a fuzzy concept, the typical situation to which it is related may be described as exchanging ideas about the structure of and the possible solutions to a problem of some importance, and collectively choosing an action from a number of alternatives, with risks involved.

Most experiments deal with single components or single stages of the complex process only. Usually they exclude defining the problem, or generating possible solutions to it. The risk of choosing a non-optimal alternative may be perceived as virtually zero, if the selected alternative is evident to all members of the group as the correct or the best one. The importance (values at stake) may be minimized, and there may be no more than a rudimentary implication of action, if the group decides on what "should be done" instead of on what "will be done", or even less if only opinion (attitude) change is studied. Collectivity of choice may be reduced by imposing all the responsibility on the group leader, if he has to decide alone after having discussed the problem with the group.

If one strives for a theoretical integration of very heterogeneous experimental results, if one wants to assess their relevance to the understanding of group behaviour in highly complex "natural" settings, a comprehensive classification system of group decision situations is needed, describing basic aspects of the relation between group members and task, of the inter-personal relations within the group, and of the relations of group members to their reference groups or constituency. It should be applicable to experimental settings as well as to natural ones.

Any classification system of group decision situations is useful in as far as it lends itself to a theoretical integration of a great variety of experimental results, of historical documents on important decision processes, and of observations in natural settings.

Recently Witte (1979) dealt with this problem, trying to select those dimensions that are both easy to handle in describing a situation, and relevant in theoretical terms. Witte distinguishes two kinds of variables. The one class of variables comprises different aspects of the information used by the group members in choosing a specific alternative. The other class of variables refer to antecedent conditions that determine the weights of the informational variables, which in his model are additively combined. There is supposed to be a hierarchical order within both classes of variables. If in the first class of variables, the antecedent conditions, a higher ranked variable is rated as extreme (high or low), the lower ranked variables are not considered further in determining the weights of the informational variables. From the hierarchical order within the class of informational variables follows that lower ranked variables are less general.

There are six antecedent variables, most of them roughly differentiated by three ordinal categories only (low, medium, high) in the following hierarchical order

- (1) Awareness of a theory on group behaviour (AT).
- (2) Group atmosphere (GA), i.e. average rating of mutual liking; (1) negative, (2) neutral, (3) positive.
- (3) Distribution of individual choices (DIC); (1) no variance (2) medium variance (3) extreme variance.
- (4) Verifiability of choice (VC) which is low, if there is neither a clear objective nor a clear social standard for orientation; (1) low (2) medium (3) high.
- (5) Commitment to a constituency (CC) which is especially

relevant in negotiations; (1) low (2) medium (3) high.

(6) Uniformity pressure (UP), defined as pressure for conforming with social values, objective standards, or small group standards.

There are four informational variables:

(1) Social value (SV) or objective standard (OS). SV is defined as the solution to the problem which is seen as most congruent with the values of a reference group. OS is defined as the solution to the problem that can be verified as the correct one.

(2) Group standard (GS), defined as the weighted mean of the individual choices within the group. Different weights may be given to the members according to their status.

(3) Weighted scale value of arguments exchanged during the discussion (AR). The weight of the argument represents how convincing it is.

(4) Individual value (IV), a term introduced in order to take into account those components of the information processing which are specific to the individual members. It is a kind of residual category.

Combining the two types of variables we arrive at a hierarchical order of predictions of a group members choice. The prediction follows a rule: "if the antecedent conditions are in a specific state, then combine the informational variables in a specific way in predicting the group members final choice Y". Table 1 presents Witte's model of individual choice behaviour (Y) in a group decision situation (1979, p. 161). The model cannot be explained in detail. We may look at just one example: it predicts that the individual choice will be the average of social value, group standard, and argumentation,  $\hat{Y} = (SV + GS + AR)/3$ , if there is no awareness of a theory ( $AT = 0$ ), if group atmosphere, distribution of individual choices, and verifiability of choice all are medium ( $GA = 2$ ;  $DIC = 2$ ;  $VC = 2$ ).

Reanalysing the data of various kinds of group experiments and performing his own experiments, Witte tested the applicability of his model. Much depends on how one categorizes a specific group situation with respect to the first set of variables that determines how to combine the informational variables. Although some of the *post hoc* categorizations can be doubted, on the whole Witte's approach seems to be more than a first step towards a better theoretical integration of otherwise very heterogeneous and poorly related experimental results. Witte's model, focusing on only one stage of the entire decision making process, i.e. on converting individual

TABLE 1

Witte's model of individual choice behaviour in group situations (Witte 1979, p. 161)

	If	Then
Awareness of theory	AT = 0	Go to GA
	AT = 1	$\hat{Y} = AR$
Group atmosphere	GA = 1	No social interaction
	GA = 2	Go to DIC
	GA = 3	$\hat{Y} = GS$
Distribution of individual choices	DIC = 1	$\hat{Y} = GS$
	DIC = 2	Go to VC
	DIC = 3	Group falls apart
Verifiability of choices	VC = 1	$\hat{Y} = SV$
	VC = 2	Go to CC
	VC = 3	$\hat{Y} = (GS + AR)/2$
Commitment to a constituency	CC = 1	$\hat{Y} = (SV + GS + AR)/3$
	CC = 2	$\hat{Y} = (SV_1 + GS_1 + AR_1 + SV_2 + GS_2 + AR_2)/6$
	CC = 3	No agreement possible
Uniformity pressure	UP varies continuously	The higher UP, the less amount of variance has to be explained by the residual category IV (individual value)

preferences into a group choice, does not lend itself to a comprehensive analysis of the whole process, especially if the decision task is poorly structured, as is the case in most real-life group decisions.

In a recent conference paper Burnstein (1980) tries to overcome this restriction by designing a process model comprising all stages from identification of the problem, over development of possible solutions to selection of one of the alternatives considered, the latter being the only stage, that has been extensively studied in experiments. This model provides for various feedback loops and thus becomes more appropriate in describing complex decision processes in natural settings, where quite often a new idea coming up in the group, or a new event in an ever changing environment, leads to a redefinition of the problem, to a new access to, search for or design of alternative solutions, and to a new selection of an alternative which seems to be more adequate. The feedback (cybernetic) model of group decision making seems to be particularly useful in analysing the documents of crucial political decisions in the past.

Having discussed two recent contributions to the field of group decision research that I consider most stimulating, I will try to give a

brief and selective review of the relevant publications during the past two years, when we saw remarkable productivity in the field of small group research in general, and of group decision making in particular. It is not so much the number of reports on single experiments, which amounts to about 40 each year, but the coincidence of several reviews and general discussions of lasting problems, that strikes us most.

A whole issue of the *Journal of Applied Behavioral Science* (Volume 15, 1979, Number 3) tries to give an answer to the question of "What's happened to small group research?" Among others Zander (1979a) adds to his annual review article on recent research (Zander, 1979b) a historic viewpoint by looking back over four decades of research, Hoffman (1979) reconsiders the significance that experimental research on group problem solving has for organizations, and Mills (1979) presents his thoughts about "changing paradigms for studying human groups". In a volume of the *American Behavioral Scientist* Newcomb (1978) gives his historic perspective on themes and theoretical concepts of small group research. In the same volume McGrath (1978) presents a selective overview of problems that have been studied up to now. He expresses his hope for a better balance of empirical and theoretical research, and for higher social significance of small group research in the years to come.

Volume 11 of *Advances in Experimental Social Psychology* contains an extensive review article on polarization of attitudes and behaviour by Lamm and Myers (1978). They give a systematic account of the well established empirical evidence of polarization following group discussion: if on average individuals prefer one side of an issue, this tendency usually becomes more prominent by group discussion. Studies simulating real life situations like jury decisions, and naturalistic observations, show that the group polarization phenomenon has some significance outside the laboratory. In the second part of the paper they evaluate the explanatory power of theoretical concepts like social decision rules, responsibility diffusion, informational influence, social comparison, finding the last two concepts the most useful.

After all one would expect that group polarization is by now an exhausted field of research. But Burnstein and Vinokur's radicalism in stressing persuasive argumentation as the only source of group polarization (Vinokur and Burnstein 1978a, b) may stimulate some

more experiments, that will eventually show that persuasive argumentation is not the whole story of group polarization. In a review of relevant research Singleton (1979) states that the concepts of social comparison and conformity tendency are needed in addition to the concept of persuasive argumentation in order to explain group induced shifts in choice. Goethals and Zanna (1979) show that social comparison is most effective in choice shift if the subjects not only know the others' choice but perceive them also as comparable to themselves on relevant ability. Greenberg (1979) finds a polarization effect in reward allocation by groups, and takes several possible explanations into account. Madsen (1978) favours the concept of persuasive argumentation showing that the influence of issue importance on choice shift is mediated by the perceived persuasiveness of the arguments presented in the discussion. Schaefer (1978) gives an example of how decision theory is able to explain some aspects of the risky shift phenomenon. Another reference to normative models of decision making is made by Dickson (1978), showing that group decisions come closer to maximization of expected value than individual decisions.

As yet the problem of commitment to group decisions has been widely neglected. Castore and Mumighan (1978) were interested in just this by looking at the determinants of support for group decisions, comparing majority rule with formal voting, discussion to unanimity, discussion to majority agreement, and choice by an experimenter appointed executor, considering the level of pre-discussion agreement among group members as well as the congruence between the individual's preference and his group's decision.

Models of jury decision making are discussed in a critical review by Penrod and Hastie (1979). The influence of authoritarianism on group polarization in mock juries has been studied by Bray and Noble (1978).

Minority influence has been studied with the colour judgement test by Moscovici and Lage (1978), relating it to the context of a social norm that gives a high value to originality of thinking. As expected salience of originality norm facilitates minority influence. Paicheler (1979) discusses the function of social norm in the influence of an extremist male or female confederate on all female or all male group members, respectively. Wolf (1979) shows, with female subjects, that a deviate is most influential if group cohesion is high, if the deviate member behaves consistently, and if there is

no opportunity to reject the deviate. But the deviate was also quite influential in the high cohesion/low consistency/possibility of rejection situation, a result which was unexpected, and which points to the importance of context in which a minority member behaves consistently or inconsistently.

Bargaining is a topic which was as frequently studied during the past two years as choice shift. Goodge (1978) gives a critical account of research on inter-group conflict. Müller (1979) studied the motivational orientations of bargainers. He found in a questionnaire study that subjects would try to maximize their own gain only if the situation was characterized as promising high gains and providing no information on the partner's outcome. If the subjects knew the partner's outcome, they tried to reach a fair agreement. Low gain possibilities induced competitive (maximizing differences) behaviour. Komorita and Kravitz (1979) looked for variations in bargaining behaviour depending on a variation of alternatives left in the case that agreement would not be reached. Slusher (1978) was interested in the effect of counterpart strategy, prior relations between the parties, and consistent pressure in simulated management-union negotiations. Wall (1979) studied the effects of mediating strategies (mediator rewarding concessions — mediator suggesting concessions) on bargaining outcomes. Brenenstuhl and Blalack (1978) focused on the question of whether subjects who prefer the role of management or union but have to play the opposite role in a negotiation game, behave differently and get different results from those whose role is congruent with their attitudes. They also made an effort to enhance ego involvement by giving grades according to their bargaining efficiency. Stephenson and Kniveton (1978) and Foddy (1978) focused on non-verbal aspects of bargaining. In the experiment of Stephenson and Kniveton with two role playing management and union representatives each, the seating position (opposite or mixed) made a difference in the inter-personal orientation and in the bargaining outcome. Foddy instructed his subjects to compete or to cooperate in a bargaining game (dividing 9 points) and observed the length and frequency of gaze and eye contact. Cooperation was positively related to the length of eye contact. Hoggatt and Selten (1978) used a bargaining game with incomplete information on the other's outcome. He compared the subjects behaviour with a normative model, and designed a computer program simulating the subjects' bargaining behaviour. A step into applied field research was

done by Cialdini *et al.* (1979) by having subjects bargain in the new car showroom. His results — tough prior consumer bargaining on a car gives an advantage in subsequent bargaining — were meant as a help in strengthening the position of the consumer.

There were few studies on group problem solving with objectively verifiable solutions. Bray *et al.* (1978) studied the effect of group size, problem difficulty, and sex on the proportion of solution and the time needed for solution. Kanekar *et al.* (1978) had different types of groups, varying in degrees of inter-dependence of group members, and in scholastic level, solve anagrams. Kabanoff and O'Brien (1979) looked after the combined effect of task type and type of cooperation on group performance. Zaleska (1978) used the horse-trading problem with university students and trade school students to which the verifiability of the correct solution was supposed to be high or low. Group performance was superior to individual performance with university students (high verifiability) only. This study included also an analysis of the communication behaviour, whereas most other studies consider only the outcome of the decision process. Mugny and Doise (1978) and Doise and Mugny (1979) reported their research on socio-cognitive conflict and cognitive development as defined by Piaget. Shiflett (1979) contributes to the construction of a general model of small group productivity. He conceives of the existing models as specifications of his general model.

The research group I belonged to at the University of Augsburg systematically studied the influence of social emotions on the attitude change of participants and observers of group discussion in laboratory and field settings (Brandstätter, 1978; Schuler and Peltzer, 1978; von Rosenstiel and Stocker-Kreichgauer, 1978; Rüttinger, 1978; Brandstätter and Klein-Moddenborg, 1979). Cognitive consistency, attribution, social reinforcement, and emotional conditioning were the basic theoretical concepts in our research. Some reports on it have been published in a book edited by Brandstätter *et al.* (1978). It also contains contributions by Davis, Lambert, Zaleska and Doise in a chapter on cognitive aspects of cooperative interaction, and contributions by Morley, Stephenson, Mikula, and Crott on mixed-motive interaction, mainly bargaining.

Some articles deal with methods of group process analysis. Bezdek *et al.* (1978, 1979) discuss the potential of fuzzy set theory for modelling group preference structures. Gottman (1979) discusses

special analytic methods as a device in detecting cyclicity in social interaction. Kraemer and Jacklin (1979) suggest a technique that allows for the statistical analysis of individual behaviour measures in dyadic interaction by taking mutual dependency into account.

I have not included in my review work on coalition behaviour and on matrix games. Although it may also be subsumed under the heading of research on group decision making in a broader sense, the experimental situations used in this kind of research differ remarkably from the typical group decision situation as it was defined at the beginning of this review. Nevertheless I want to mention two review articles, one of Murnighan (1978) on models of coalition behaviour in game theoretical, social psychological, and political perspectives, and one of Schlenker and Bonoma (1978) on the "validity of games for the study of conflict".

During the last few years social psychologists began to raise some doubts on whether social psychology is directed towards the really important problems and on whether experimentation should still be the principal method in analysing social interaction. They are concerned about its neglect of cultural context in its past development and in its present differentiation. They point to its oversimplification and artificiality and they complain about its irrelevance to the solution of real problems (Gergen, 1978; Jahoda, 1979). Are there any signs in the recent literature on group decision-making that mirror these doubts and the search for a new approach? Generally, the experiment is still the dominant method in the field of group decision research; there still seems to be little concern with its limitations, and rather little broadening of the view in theoretical and methodological terms. But there are exceptions, two of them I have mentioned briefly, that point into the direction future research on group decision-making could take.

It will be necessary to find a better way of combining comprehensive but rather subjective intuitive understanding and restricted but precise experimental analysis. In my research group we started to collect information on the assumptions people have about how subjects would respond to a specific experimental situation. We used to ask social psychologists, as well as people belonging to the same population from which the participants in the main experiment come, to state their subjective probabilities of specified hypotheses and to give their reasons for them. This usually gave us a better idea of what might happen within an experimental situation than we had



before, and sometimes this led us to a modification of the experimental design.

Another way to use the insight people have in their own experience and behaviour is to have them describe and interpret the process of decision making in which they recently have participated. This should be especially valuable in a situation where observation is not feasible. We have to accept that experiments can only provide us with markers on the map representing our knowledge of the field. Whether we can trust them, and how we fill the space between them, has to be decided by considering all other available sources of information, including personal experience and intuition.

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