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An Empirical Study Measuring Conflict in Problem-Solving Groups Which are Assigned Different Decision Rules

Gideon Falk¹

Department of Management, University of Illinois at Chicago

The paper has two goals. First, to find out whether majority rule or a unanimous decision rule would facilitate more task conflict. Second, to develop several operational measures of task conflict. The study used an experimental design using 18 groups. The group discussions were tape recorded and coded using the valence coding system (Hoffman & Maier, 1964, 1967). Eight operational measures of task conflict are presented and used to test the main hypothesis. The results indicate that in unequal power groups an assigned majority rule facilitates more task conflict than an assigned unanimous rule or no assigned decision rule. The eight measures of task conflict are shown to be useful but require additional refinement.

INTRODUCTION

The literature generally makes a distinction between social (interpersonal) conflict and task (substantive) conflict. A social conflict is “a struggle based on selfish or personal issues” such as power, group norms, or procedural problems (Fisher, 1980). Task conflict is a difference of opinion regarding the issues involved, such as: solutions, criteria, definitions of the problem, or interpretation of information. While social conflict is usually considered as disruptive (Guetzkow & Gyr, 1954; Burgoon, Heston, & McCroskey, 1974; Fisher, 1980), task conflict is usually considered as con-

¹Requests for reprints should be sent to Gideon Falk, Assistant Professor, Department of Management, College of Business Administration, University of Illinois at Chicago, P.O. Box 4348, Chicago, Illinois 60680.

structive (Hoffman, 1961; Thomas & Fink, 1961; Hoffman, Harburg, & Maier, 1962; Maier & Hoffman, 1965; Maier, 1965, 1967; Beisecker, 1969; Holloman & Hendrick, 1972; Fisher, 1980).

Existence of a task conflict is not a guarantee for attainment of effective decisions since it can (and often does) deteriorate to a social conflict and group members may lack creativity to unveil and adequately analyze alternatives. However, it is generally believed that the existence of task conflict increases the probability of attainment of creative solutions relative to a situation where a task conflict is not present (Hoffman, 1961; Maier, 1967; Fisher, 1980). Therefore, methods that can facilitate the emergence of task conflict are expected to increase the likelihood of reaching effective decisions.

One of the necessary conditions for facilitating the emergence of task conflict is an atmosphere in which all group members can freely express their opinions and the existence of differences of opinions among group members² (Maier & Solem, 1952; Hoffman, 1961; Van de Ven & Delbecq, 1971). Dominance of a powerful person over the group process has been frequently regarded as an obstacle to free expression of ideas in groups and consequently to attainment of creative solutions (Torrance, 1954; Maier & Hoffman, 1960, 1965; Hoffman, 1961; Maier, 1967). Therefore, methods that can reduce power inequalities in a group have a potential for improving the group interaction on the task level, i.e., facilitate the emergence of a task conflict.

Falk and Falk (1981) and Falk and Hoffman (1979) have shown that assignment of a decision rule has a potential for changing the initial distribution of power in an unequal power group. In particular, majority rule presents the greatest such potential in some unequal power groups. Therefore, it is expected that assignment of a majority rule in unequal power groups has a greater potential for facilitating task conflict than assignment of a unanimous rule. It is also expected that the level of task conflict in majority rule groups is likely to be higher than in groups to which no decision rule is assigned. The purpose of this study is to examine these propositions. The discussion and analysis will build upon Hoffman's (1961) concept of valence and Hoffman and Maier's (1964) measurement of valence for solutions.

CONFLICT AND VALENCE IN PROBLEM-SOLVING GROUPS

Drawing upon Lewin's (1935) concept of valence, Hoffman (1961) extended its application to problem-solving groups. Following Hoffman's

²For a more comprehensive and detailed description of the necessary conditions see Hoffman (1961).

work, valence is defined here as the degree of support for an idea in a group or alternatively the strength of a force exerted on an individual or a group toward the adoption of an idea.

Valence can be either a positive or a negative force, indicating acceptance and liking of an idea or opposition and dislike of it. Each member in a group can generate positive and/or negative valence for a solution which can be summarized in an overall index.³ The group valence for a solution reflects the degree to which a suggested solution is acceptable to the group as a unit. Valence at the group level is influenced by the amount of power of the person(s) supporting a solution (Hoffman, 1961) as well as by the commitment, involvement, and strength of conviction displayed by the supporters and antagonists to a solution.

Hoffman (1961) and Hoffman and Maier (1964, 1967) claim that in order for a solution to be adopted it must surpass the “adoption threshold”—i.e., it must have a higher positive solution valence than some minimum value.⁴ If a solution fails to exceed the adoption threshold it will not be adopted. If two or more solutions acquire more valence than the threshold, either the solution with the highest positive valence will be adopted by a group or a conflict situation occurs. Hoffman (1961) has defined conflict in terms of valence as a condition in which:

At least two differing cognitions must acquire greater positive valence than the minimum threshold value and must be approximately equal in value, so that none of the alternatives can be accepted and an impasse is reached (p. 434)).

Following Hoffman's definition of conflict, a task conflict will be defined here as a conflict between two or more ideas that have about equal valence (support). In other words, task conflict is a situation in which more than one idea is presented and each receives substantial support.

DECISION RULES AND TASK CONFLICT IN UNEQUAL POWER GROUPS

Unequal power groups must contend with the power of the powerful person. Research has found that in unequal power groups in which no decision rule has been assigned, the powerful person tends to dominate the discussion and low power members tend to be submissive (Torrance, 1954; Maier & Hoffman, 1960; Hoffman & Maier, 1967).

³Valence does not have to necessarily be applied only to solutions. It can be applied to any part of the process. Examples: definition of a problem, criterion, interpretation of information.

⁴The “adoption threshold” stands for a significant amount of support for a given solution. The authors suggest that passing the adoption threshold is a necessary condition for the adoption of a solution (Hoffman & Maier, 1964, 1967).

Unanimity rule, in unequal power groups, generates opposing forces. On the one hand, a force is generated towards a greater equalization of power since the low power members have a veto over the decision. On the other hand, a force is generated in favor of the powerful person's viewpoint since he⁵ has a veto power too and can prevail until his preferred decision is adopted. On balance, the initial distribution of power is not expected to change significantly in groups assigned a unanimous rule (Falk & Falk, 1981; Falk & Hoffman, 1979). As a result, the valence for the solution preferred by the powerful member is likely to be much greater than that for an alternative preferred by the low power members. Therefore, task conflict is not expected to occur significantly more than in groups in which no decision rule has been assigned.

A greater potential for reduction in the power inequality is presented under majority rule. In such groups, the low power members have an opportunity to form an implicit coalition against the more powerful person and be more assertive in voicing their opinions (Falk & Falk, 1981; Falk & Hoffman, 1979). The perception that they can carry the decision without the consent of the powerful person (which is not possible under a unanimous rule) may give them a feeling of added power and encouragement to increase their valence for their preferred solution and against unfavored alternatives.

Perceiving a potential for a coalition of the low power members that can be formed against him, the powerful person may perceive a diminished ability to push through his favored solution. This may induce him to be more permissive in allowing greater freedom of expression of opinions to the members of the group. This permissive atmosphere may be reflected in reduced valence generated by the powerful person for his preferred solution and against other alternatives. However, since the powerful person may not be willing to relinquish his power entirely he may try to convince the other members to adopt his solution, although he may do this to a lesser extent and use softer methods under majority rule than under unanimity and no decision rule. As a result it is expected that the powerful member and the lower power members will each generate valence for their preferred solutions that will surpass the adoption threshold. This suggests that task conflict is likely to occur more frequently and be of greater intensity in groups under majority rule than in groups under unanimity and no assigned decision rule.

⁵The pronoun "he" is used for reasons of convenience for both male and female.

METHOD

The empirical investigation used a laboratory experiment. The experiment involved 18 groups of 4 persons who role-played the Change of Work Procedure (CWP) problem (Maier, 1952).

Experimental Conditions

The groups were assigned to one of three experimental conditions: majority rule, 8 groups; unanimity, 4 groups; and no decision rule, 6 groups. Majority and unanimity rule were assigned to the groups by adding to the subjects' role a pertinent paragraph as follows:

It has been the company's policy and this team's practice to arrive at all group decisions by reaching consensus and unanimity of all four group members. Using a unanimous rule for the total group, including the foreman, seems to contribute to effective work.

It has been the company's policy and this team's practice to arrive at all group decisions by using a majority rule of all four group members. The majority rule for the total group, including the foreman, seems to be a practical decision rule for your group. It has proven to be a good way to resolve conflict and avoid wasting time in endless discussion.

The no decision rule groups received the same roles but without the additional paragraph.

Subjects

The subjects were students of business administration in a small mid-western state university. Most of the students were undergraduates between the ages of 25 and 35 and working full time. They consisted of a mixture of suburban and urban background.

The Task

The "Change of Work Procedure" (CWP) problem contains four roles—a foreman and three workers. The foreman calls a meeting to discuss a change in work method based on time-study data.

In the CWP problem the three workers were working as a team for a long time and were rotating on three different positions every hour. The top administration asked a methods' man to perform a time-study. His report indicated the time each worker spends on each position and recommended that they work on a fixed position (each on his best position) in order to

increase productivity (the New solution). Two workers had similar preferences that called for resistance to the change mainly because of the greater boredom the fixed position would impose on them (the Old solution). One worker had a built-in role conflict. He was the slowest among the three workers, was self-conscious of it, and felt most comfortable working on the fixed position designated for him by the methods' man. This encouraged him to favor the recommended change. On the other hand, he felt loyalty to his peers with whom he had close social ties. This encouraged him to oppose the proposed change. The foreman favored the proposed change.

Procedure

Each group sat in a separate room and was tape recorded.⁶ The experimenter started with announcing the type of problem the group was about to work on and by reading the general instructions to the problem at the end of which questions were solicited. At this time the roles were distributed and the groups were told that they had 40 minutes for discussion. At the end of the discussion each subject received a questionnaire and was asked to respond to it individually.

The total group discussion was tape-recorded, transcribed, and later coded. One observer sat with each group and recorded (a) the identification of each speaker (e.g., foreman), and (b) the beginning of each person's sentence. This was done in order to identify in the transcript who the speaker was.

The Valence Coding System for Solutions

The purpose of this coding system is to draw a map of the forces operating in a discussion group. A coder translates the verbal statements of each group member into a code indicating support or opposition to any of the possible solutions under consideration. Only statements that are related to the attraction or rejection of a specific solution are coded. Such a statement is labeled as a valence "act" for a solution. A valence act is a word or a number of words which jointly express an idea, opinion, fact or feeling that either supports (coded as a "+") or rejects (coded as a "-") a solution. The acts are coded separately for each solution and for each individual member. Thus, each expression of support for the Old solution is coded as "O+" and for the New solution "N+." Conversely, each expression of opposition to the Old and New solutions is coded as "O-" and "N-" respectively. The same procedure is used to code positive and negative valence acts for other

⁶After a consent to tape the discussion had been obtained from the subjects.

solutions. The “net valence” for a solution is the sum of the positive solution acts minus the sum of the negative acts.

As indicated earlier, Hoffman (1961) and Hoffman and Maier (1964, 1967) posit that in order for a solution to be adopted by a group it must surpass the adoption threshold. The “adoption threshold” is measured in terms of the net valence for a solution and has been empirically found in a number of studies to be +15 (Hoffman & Maier, 1964, 1967; Block, 1974). This figure is also used in this study. The intercoder reliability for the valence coding was at the level of .8 and higher which suggests that the coding was reliable.

RESULTS

The propositions advanced in this study will be examined by testing the following hypothesis.

Hypothesis

Problem-solving groups, working on the CWP problem, which use a majority rule, will have a higher level of task conflict than groups using unanimity rule or no assigned decision rule.

The measurement of task conflict in a group is difficult and complex (Guetzkow & Gyr, 1954; Hoffman, Harburg, & Maier, 1962). Although measuring task conflict seemed to be one of the main purposes for developing the valence coding system (Hoffman, 1961; Hoffman & Maier, 1964, 1967), such measures have not been used before. The development and improvement of measurement of task conflict has facilitated the testing of the major proposition of this study (as expressed in hypothesis 1).

The higher the level of task conflict the more discussion will be needed to resolve the impasse. This means, the higher the level of task conflict the more valence acts are expected to be generated. Conversely, the more valence acts that are generated the more it may reflect the existence of task conflict in the group. Majority rule is generally believed to reduce the amount of discussion (in terms of the total number of valence acts) relative to unanimity. This is because, under majority rule, the group is not required to secure agreement of all group members for the final solution. Thus, if in spite of this effect it can be shown that majority rule produces more solution valence acts than unanimity and no decision rule, then it may be argued that majority rule induces more task conflict. Since groups under a unanimous rule and no decision rule have shown similar behavior (Falk,

Table I. Effects of Decision Rules on Task Conflict – A Valence Analysis

Measure	(n)	Decision Rule				p ^a
		Majority rule (8)	Unanimity rule (4)	No decision rule (6)	All groups (18)	Majority rule highest
(a) Mean number of solution valence acts ^b		489.3	323.5	322.7	396.9	+
(b) Mean net valence for adopted solution ^c		90.8	60.8	60.2	73.9	+
(c) Mean number of solutions that surpassed adoption threshold		2.38	2.00	1.83	2.11	+
(d) Proportion of groups in which at least two different solutions gained net valence in excess of + 15		.75	.50	.50	.61	+
(e) Proportion of groups in which at least one solution acquired net valence of less than – 15		.75	.25	.50	.56	+

^aAll tests are one-tailed measuring differences between majority rule and the other groups. *t* test performed for measures (a), (b), and (c). Test of proportion performed for measures (d) and (e).
^bMedian number of solution valence acts in majority rule, unanimity, and no decision rule groups was 396.0, 269.0, and 333.5, respectively.
^cMedian net valence for adopted solution in majority rule, unanimity, and no decision rule groups was 71.0, 53.5, and 57.5, respectively.

1981; Falk & Falk, 1981), these sets of groups will be combined in the statistical analysis.

Measure (a), in Table I, presents the mean number of solution valence acts for all the solutions that have been proposed during the discussion. The results indicate that majority rule groups have considerably more solution valence acts (489.3) than groups under unanimity and no decision rule (323.5 and 322.7, respectively). These differences are statistically significant (t , 16, $d.f.$ = 1.79, p < .05, for majority rule vs. other groups, one-tailed test). This supports the hypothesis that majority rule is likely to induce more task conflict than the other decision rules. Given that majority rule is believed to reduce the length of discussion (in terms of valence acts), this finding is of added significance.

The greater the task conflict, the more valence acts would be generated for and/or against the various alternatives including the adopted solution. Thus, measure (b), which represents the mean net valence for the adopted solution, is used as a proxy for the existence of task conflict. Table I shows that the mean net valence for the adopted solution was higher for majority rule groups (90.8) than for unanimous (60.8) and no decision rule groups (60.2). These differences are statistically significant (t , 16, $d.f.$ = 1.38, p < .10, majority rule vs. the other groups, one-tailed test).⁷

The greater the number of solutions that gain sufficient valence to surpass the adoption threshold level, the more likely it is to reflect the existence of task conflict in a group. Thus, to measure task conflict, it is useful to look at the mean number of solutions that have surpassed the adoption threshold level under various experimental conditions. Using this measure (c) the results indicate that this mean is slightly higher under majority rule (2.38) than under unanimity and no decision rule (2.00 and 1.83, respectively). However, these differences are not significant.

Hoffman (1961) posits that task conflict is reached when at least two different solutions pass the adoption threshold level. Thus, measure (d) reflects the proportion of groups in which at least two different solutions gained a net valence in excess of +15. Table I shows that this proportion was higher for majority rule groups (.75) than for unanimous and no decision rule groups (.50 for both) as expected but not significantly different.

The higher the intensity of task conflict, it is expected that more valence acts would be generated, not only for members' preferred solutions, but also against unfavored solutions. Thus, it is expected that groups engaged in task conflict would not only generate more valence for the

⁷Due to the small sample p < .10 is used for determination of significance.

adopted solution but would generate also more valence against unfavored solutions. Using as a yardstick a net valence of -15 to represent a rejection of a solution, measure (e) reflects the proportion of groups in which at least one solution had a net valence below the rejection threshold level during the discussion. The results in Table I indicate that majority rule groups had the highest proportion of such groups (.75). The proportion of unanimous and no decision rule groups was .25 and .50, respectively ($Z = 1.49, p < .07$, majority rule vs. the rest, one-tailed test).

As suggested by Hoffman (1961), groups which are engaged in a task conflict would ideally attempt to resolve it by searching for new alternatives and ways to integrate the conflicting viewpoints.⁸

At the beginning of the discussion the experimental groups were likely to discuss the Old and New solutions which are suggested in the problem. That is, groups are likely to discuss whether to continue to rotate on the three positions every hour, as they were doing for a long time (Old), or to switch to the fixed position, as suggested by the foreman (New). If none of the existing solutions are acceptable to a group, it would search for other alternatives. Depending on the ability of group members to unveil new ideas, these alternatives may range all the way from "slight modifications" of the existing solutions to "new alternatives" that are substantially different from the existing solutions. Thus, the search for other alternatives is likely to indicate the existence of task conflict in the group. If majority rule groups engage in a higher level of task conflict, they are more likely to engage in a search for other alternatives than groups assigned the other decision rules. Following this rationale, the extent of this search will be examined first in terms of the number of "new alternative" solutions⁹ that were proposed by groups during the discussion. Next, the number of "slightly modified" solutions will be explored.¹⁰ Although this does not entail a valence analysis, this analysis was made possible by the data in the 18 transcripts which were obtained for the valence analysis.

Measure (a) in Table II reflects the number of "new alternative" solutions other than the Old and New solutions that were proposed under the three experimental conditions. The results indicate that majority rule

⁸Negative ways to resolve the impasse may result in a breakdown of the group, failure to reach a decision, and dominance of a power figure or a majority over the decision (Hoffman, 1961).

⁹These are solutions other than the Old or the New solutions, which are proposed in the problem itself; see the Method section—the Task.

¹⁰"Slight modifications" are solutions that vary from any of the major solutions in some small way which may seem to a group as a different solution but is *not* substantially different in substance from one of the major solutions and therefore is not considered a "new alternative" solution.

Table II. Decision Rules and Task Conflict – New Alternatives and Modified Solutions

Measure	Type of measure	(n)	Decision rule				Support hypothesis	p ^a
			Majority rule (8)	Unanimity rule (4)	No decision rule (6)	All groups (18)		
(a)	Mean number of "new alternative" solutions ^b		2.13	.75	1.17	1.50	+	.06
(b)	Mean number of "modified" solutions ^c		5.00	2.00	3.00	3.67	+	.05
(c)	Proportion of groups in which an early solution was adopted ^d		.25	1.00	.83	.61	+	.005

^aAll tests are one-tailed and measure the difference between majority rule groups and other groups. *t* test performed for measures (a) and (b). Test of proportion performed for measure (c).
^b"New alternatives" are solutions substantially different from both the Old and the New solutions.
^c"Modified" or "slight modifications" are minor variations of major solutions.
^dAn "early" solution is either one of the original solutions (Old and New) or one of the two first "new alternatives" or "modified" solutions.

groups proposed a greater number of alternatives (2.13/per group) relative to groups under unanimity and no decision rule (.75 and 1.17, respectively). This difference is statistically significant (t , 16 *d.f.* = 1.71, p < .06, majority rule groups vs. other groups, one-tailed test).¹¹

Using a similar theme as in the previous measure, measure (b) reflects the total number of “new alternatives” and “small modifications” of existing and “new alternative” solutions that were proposed by the groups during the discussion. Table II shows that this number was higher in groups under majority rule (5.0/per group) than under unanimity and no decision rule groups (2.0 and 3.0, respectively). These results point in the expected direction and are statistically significant (t , 16, *d.f.* = 1.96, p < .05, majority rule groups vs. the rest, one-tailed test).

The more severe the task conflict, the less likely is the first new alternative or modified solution to be adopted. Thus, majority rule groups are less likely to jump at the first opportunity to resolve the conflict by adopting the original solutions (Old and New) or the first proposed “new alternative” or “modified solution.” Measure (c) in Table II reflects the proportion of groups in which either the original solutions were adopted or one of the first two “new alternatives” or “modified solutions” were adopted. The data reveal that the proportion of such groups is substantially lower in majority rule groups (.25) than in unanimous and no decision rule groups (1.00 and .83, respectively), as expected. These differences are statistically significant (Z = 2.81, p < .005, one-tailed test).

DISCUSSION

This study has utilized eight measures of task conflict to test the hypothesis of whether a majority rule has a greater potential for facilitating task conflict in unequal power groups than unanimous rule and no decision rule. Although not all the differences were statistically significant, most were. The results of this study thus generally indicate that majority rule groups were more likely to engage in task conflict than unanimity and no decision rule groups. Given the small sample, the fact that significant differences were obtained at all lends credence to the results.

Building upon extensive research in support of facilitation of task conflict as a means of promoting high-quality solutions, this study proposed a new method for facilitating task conflict in unequal power groups—namely assignment of a majority rule. This study also supports a previous study by Falk (1981) which challenged the popular notion of the

¹¹Measure (a) does not include the Old and New solutions. If it did, the numbers in Table II would be 4.13, 2.75, 3.17, and 3.50, respectively.

universal superiority of a unanimous rule over the other decision rules. The superiority of a unanimous rule has great validity and appeal for equal power groups as suggested by Bower (1965), Hall and Watson (1970), and Holloman and Hendrick (1972). However, their conclusions are not valid for unequal power groups.

Although this study has fulfilled its objectives, further research is needed to support the conclusions of this study, mainly in the following areas:

1. This study does not cover all possible unequal power groups. It is based on a problem in which at least two members have similar preferences. In groups in which the majority of the group members have similar preferences to those of the powerful person, majority rule may not be more effective than unanimity or no decision rule in changing the distribution of power and consequently generating task conflict.

2. A larger sample is needed to obtain more conclusive results.

3. Although one of the contributions of this paper is the development of several measures of task conflict, a greater refinement of these measures may be needed. The valence conceptual framework (Hoffman, 1961) and the valence coding method (Hoffman & Maier, 1964, 1967) provide an excellent basis for development of such measures. This method has an advantage over measures developed from responses to a post-experimental questionnaire since the valence coding method is based on observed behavior which lends itself to more objective interpretation. Responses to a post-experimental questionnaire may be clouded by the subjective interpretation and bias of the participants, their perceived role (Orne, 1962; Rosenthal, 1966), and the adequacy of the questions. However, the valence coding method has several shortcomings. It aggregates the number of statements for and against a solution giving each statement equal weight. It ignores the extent of the commitment of each member to or against a solution and the strength of the force generated by the powerful person by virtue of his position. As has been suggested by Hoffman (1961) and by Falk and Hoffman (1979), the powerful person does not have to continually verbalize his opinion in order that his preferred solution receives a greater net valence than the solutions preferred by the low power persons.

In addition, another question is raised by this study. In order to apply the majority rule to organizational groups or committees either the organization has to adopt the majority rule as a policy or individual managers would have to recognize their power advantage, and the obstacles it provides to effective decision making, and consciously give up some of their power. This is difficult for most managers and therefore it may provide a major block in applying the majority rule to real-life problem-solving groups.

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BIOGRAPHICAL NOTE

GIDEON FALK is currently an Assistant Professor in the Department of Management, College of Business Administration, University of Illinois at Chicago, Chicago, Illinois. Born in Israel, he holds a BA degree in Economics and Statistics as well as an MBA from the Hebrew University of Jerusalem. He also earned a MA in Economics from Stanford University. He received his PhD from the Graduate School of Business, University of Chicago in 1978. Dr. Falk has published several articles and presented numerous conference papers mainly in the area of group problem solving and group decision making. His research interests are: the generation and impact of conflict in problem-solving groups, the effect of power on members' behavior, the generation of criteria in decision-making groups, the role of the devil's advocate, the interaction of decision rules with members' power, and the problems and effectiveness of Quality Circles.