AN OBSERVATIONAL STUDY OF SOCIAL INFLUENCE

PROCESSES IN SMALL GROUP DECISION MAKING

by

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Abstract

This research investigated a number of hypotheses concerning the form of social influence between factions in small group decision making. In an effort to avoid the bias which may result from the use of confederates in such research, the six person groups used in this study were composed entirely of experimentally naive subjects. Five specific hypotheses were investigated: a) that the influence of a faction depends upon the extent to which they are perceived as cohesive and consistent by the others (i.e., on their apparent solidarity); b) that as the size of a faction increases, that faction will be perceived by the others as being both more competent and less confident with respect to the issue at hand; c) that the faction which wins the first convert will exert more influence on the final decision; d) that disagreement will be solved by compromise; e) that the influence of a faction is a function of the frequency of communication by that faction.

The problem discussed was a labour-management dispute. Eight to ten volunteer subjects whose responses to a wage settlement item on an opinion survey fell into either the range of 8%-12% or 30%-40% were scheduled to participate in a group, with this scheduling manipulated in such a way that there was a majority of "high" subjects assigned to each group. On arriving for the experiment, subjects were given a brief description of a labour dispute and asked to indicate their personal belief regarding the proper percentage wage increase. Six of the subjects were then selected to serve as the discussants, and the remaining subjects were asked to act as observers. Because the survey opinions proved to be unreliable indicators of the responses to the issue used in the experiment, the initial groups of eight to ten subjects often did not have a distinct "high" -"low" split, and for this reason the selection of the six discussants was done so as to maximize the polarization within the discussion group. The discussants were then given twenty-five minutes in which to

simulate an arbitration of the dispute and to reach an agreement. During the discussion, the observer subjects and the two experimenters observed the group from an adjacent room through an observational glass. The discussion was recorded on audio tape and the two experimenters also independently coded each comment made by the subjects in terms of which person was speaking, to whom she spoke, and whether her comment favoured a "high" or "low" decision. When the group reached consensus (or at the end of the allotted time), all subjects completed a questionnaire concerning the course of the discussion, characteristics of the discussants, and opinions on a similar case.

Fifteen discussion groups were used in the study. The results indicate: a) that compromise was not the means by which decisions were reached; b) that while the final decision did not always favour the faction which won the first convert, that faction was generally more influential; and c) that the other three hypotheses were unsupported.

There are certain limitations to the generalizability of these data, based upon the combination of the small sample size and the amount of between group variability. The implications of these factors are discussed in detail, both with respect to the reliability of the obtained results and the problems for future research.

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Acknowledgments

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1. Introduction

Perhaps the single most inescapable fact of modern existence is the

extent to which group process has become responsible for the great majority

of the decisions which affect the life of each and every individual. In

every sphere - social, political, educational, occupational - it is the group

which is charged with the direction of the vast number of functions which,

through increasing complexity or sheer size alone, have been placed beyond

the capabilities of the single individual. As an example, consider the mod-

ern industrial plant. Even though there may be a single person who possesses

the appearance of power, this appearance is increasingly a matter more of

form than of function. It has become impossible for even an individual of

genius to master sufficiently the content and continuing developments of

such diverse areas as technology, administration, labour relations, market-

ing, and so on which are required to exert effective direct control over

such an operation. In most, if not all, cases, the responsibility for dis-

crete areas of operation devolves on qualified individuals or groups in each

area, and the decisions attributed to the president or general manager in

fact reflect the decisions of a management group or groups (cf. Galbraith,

1971, Ch. 6).

With this realization of the prevalence of groups which hold decision

making powers, there also comes a very real concern for the quality of their

execution of that function. Undoubtedly, the great strength of the group

format is that it allows the bringing together of individuals with diverse

and preferably complementary areas of competence, who in combination pos-

sess resources far exceeding those of even the most capable individual. This

fact gives the decision making group a distinct potential advantage over the

lone individual. But is this potential realized in practice, and under what

circumstances?

Despite its ubiquity, the decision making group apparently enjoys little public credibility, a fact reflected in the popular adage "A camel is a horse designed by a committee." Nor is the experimental literature resoundingly favourable toward the group. While thousands of studies have been conducted to assess the effectiveness of the group in relation to individuals (e.g., Hare, 1972), the implications of the results for assessing (and more importantly, improving) the value of group process are still unclear.

On the positive side, some research has shown that a group, working together, can be superior to even the best member working in isolation (e.g., Anderson, 1961; Faust, 1959; Goldman, 1965; Husband, 1940; Laughlin, Branch & Johnson, 1969; Shaw, 1932; Taylor & Faust, 1952). Upon examination, however, this finding seems limited to those situations which benefit from a division of labour, involve the creation of a variety of ideas by individual members, and allow members to recognize and correct each other's error (cf. Shaw, 1971). Examples of this type of problem are logical puzzles, anagrams, and creative problems such as the production of as many words as possible from a set of letters. In other siutations, primarily those involving matters of fact such as responses to multiple choice achievement test items (Gurnee, 1937) or estimation of the number of beans in a bottle (Jenness, 1932), group performance can equal but will not generally exceed that of the most proficient member. It appears, then, that when the problem involves relatively few steps and the possible solutions can be reliably evaluated by all members, the group will function at least as effectively as its best member and may even be superior (Kelley & Thibaut, 1969).

If these were the sorts of problems with which actual groups were con-

cerned, then there would be considerable support for an optimistic view of the group's ability to deal with them. This is not the case, however. It is precisely those problems which do not involve the application of straight forward methods or the discovery of easily verifiable solutions which tend to fall into the province of the decision making group, and it is with regard to these sorts of problems that the literature is most pessimistic. For example, when a task is complex, involving thinking through a number of interdependent steps and applying a number of decision criteria at each stage (e.g., Faucheux & Moscovici, 1958, cited in Kelley & Thibaut, 1969), a group will perform below the level of even an average group member. In this situation, it appears that the group interaction generates simple "noise" or confusion which detracts from the group's ability to follow a consistent strategy (Kelley & Thibaut, 1969; Maier, 1967).

Another factor which may seriously detract from a group's problem solving ability is the degree of uncertainty associated with the various possible solutions. When the characteristics which distinguish "good" and "bad" solutions are ambiguous, or when the consequences of various decisions are not certain but rather only probabilistic, then the multiplicity of suggestions which a group can produce becomes a potential disadvantage. In the absence of any objective criteria for selecting one solution from among the many available, the movement toward an eventual decision by the group will have to be based on other, possibly task irrelevant, factors. As evidence of the existence of this problem, it has been found that in cases where the verifiability of solutions is low, a group discussion of the problem will encourage convergence on a single solution (even in the absence of a need for consensus) but that this convergence will not necessarily be in the direction of the best solution (Thomas & Fink, 1961). In such cases, the outcome of

the group discussion depends more upon the characteristics of the persons involved then upon the relative quality of the solutions considered. It seems that the adoption of a given solution is determined more by a process of social influence than by a critical evaluation of the alternatives available, as the solution forwarded by the most convincing, most confident or, possibly, most vocal member tends to be the one most likely to be accepted regardless of its veridical status.

In short, whether or not a group will function effectively in the performance of problem solving or judgment appears to be a function of the interaction which is required by the task (cf. Hackman & Morris, 1975). If the problem involves the pooling of individual efforts, then the group will perform more effectively than a single individual, although it will not necessarily exceed the performance of a "nominal" group - i..e-., the group's products may not surpass the sum of the efforts of an equal number of individuals working. independently (Anderson, 1961). In addition, when the task benefits from mutual error checking to reject incorrect solutions, then the group performance will exceed that of a nominal group (e.g., Faust, 1959). In these problems, the interaction required is clearly defined and can generally be considered to be simply the maintenance of a forum in which individual contributions can be accumulated and their legitimacy evaluated according to some relatively unambiguous standard available to all members. When, however, the task requires a cooperative effort on a more complex problem, particularly one for which the optimum solution cannot be determined beyond a certain level of probability, then the group may perform more effectively than the most able member or it may perform more poorly than the least able member, depending upon the nature of the interaction which takes place. Specifically, in such a situation the effectiveness of the group apparently depends not upon the

discovery of the best solution, but upon the success of the discoverer in his attempts to advance that solution; it is a function of the dynamics of the group rather than the credibility of the solution. In view of this rather critical importance of social influence in determiningitheuoutcome of a group process, it is necessary to consider the role of interpersonal influence in group discussion and the effects which such influence has upon the products of the decision process.

The Role of Social Influence

It has been noted (Maier, 1967) that a group has certain assets and liabilities which it brings to a decision situation. The assets which distinguish a group of a given size n from an individual in such a situation can be expressed in terms of the n heads rule, which is summed up in the time worn adage "Two heads are better than one." Simply stated, this rule asserts that it is logically necessary that the members of a group of size n will possess at least as much if not more information pertaining to the problem at hand than the same group less any number of its members. Similarly, that group which is largest will contain the greatest number of viewpoints from which to assess that information and the widest variety of backgrounds upon which to base suggestions for the resolution of the problem. Therefore, in principle at least, on any question (particularly if it is one of uncertain solution), that group which comprises the greatest possible number of members should be at least as able as any smaller group at generating an optimum solution.

Unfortunately for the quality of group decisions, however, it is equally true that the n group members possess at least as much misinformation and bias as any lesser number, and that in the absence of a guaranteed method of separating the desirable from the undesirable components, it may well be that it is the misinformation and bias which are incorporated into the final deci-

sion. It is worth noting here that the n̲ heads rule referred to above in-
volves only the size of the group, and thus the assets which the group pos-
sesses are unaffected by either task or group factors other than size.
However, the method of extracting and integrating information and opinions
to form a group decision does not share this exemption.

The traditional method of pooling the information and opinions held by
various persons in order to reach a single group judgment is one of face to
face interaction, and it is this interaction which gives rise to a group's
potential liabilities. As we noted in the previous section, when a task
involves relatively simple operations and allows clear discrimination of
valid and invalid solutions, the interaction process does not adversely af-
fect the group's functioning. In such a situation, the influence which does
occur during the discussion can be seen to be primarily simply informational,
as for example in Shaw's (1932) study which found that group problem solving
ability exceeded individual ability largely due to the much greater rejection
of incorrect suggestions by other group members than is the case with indi-
viduals assessing their own ideas. This sort of influence is clearly rele-
vant to the task's requirements.

When, on the other hand, the correct solution is not easily distinguished,
and especially if its correctness cannot be conclusively demonstrated within
the confines of the group's experience, then the group interaction experience
gives rise to a number of factors such as social influence, goal conflict,
and simple "noise" which affect the group's deliberations in ways unrelated
to the task requirements and thus may decrease the group's performance.

The most important of these factors is social influence. Since influ-
ence is defined as an "action of a person or thing on or upon another, per-
ceptible only in its effects" (Concise Oxford Dictionary), it is perhaps

belabouring the obvious to assert that social influence occurs in situations such as those referred to above. The very fact that some group member (or members) must renounce an initially preferred solution in favour of the group's consensus necessarily means that influence occurs in the formation of every group decision. However, in problems involving uncertainty of solution, this social influence assumes a central role. Here the acceptance of a solution cannot be dictated solely by the solution's merit, either because that merit is not measurable or because various solutions appear equally appropriate depending upon the subjective values assigned to aspects of the problem and consequences of a chosen solution. This being the case, social influence factors such as talkativeness (Thomas & Fink, 1961), confidence (cf. Hollander & Willis, 1969, p. 63), and convergence on a consensus (e.g., Sherif, 1935; Janis, 1972) determine the outcome of the group process. In fact, it can be said that with regard to problems for which there are not unequivocal arguments compelling the selection of one specific solution or consensus point, it is only the operation of some form of social influence which allows a decision to be reached at all.

In considering the nature of social influence in group decision making, the concepts used by Kelman (1961) will prove useful. He based his discussion of the process of social influence on the form of acceptance of the influence attempt, distinguishing among three not entirely distinct types; compliance, identification, and internalization. The first, compliance, occurs when "an individual accepts influence from another person or group because he hopes to achieve a favourable reaction from the other." (Kelman, 1961, p. 62). It is distinguished by the fact that the person's expression of the belief, behaviour or attitude involved is dependent solely upon considerations of the social effect of such expression. The second type, identification,

occurs when a person adopts behaviours, beliefs or attitudes characteristic of another person or group because this adoption places the person in a desirable role relationship to that other person or group. Thus, influence resulting in identification proceeds from the attractiveness of the influencing agent (whether based upon the characteristics, power, or position of said agent). The third response, internalization, occurs when an individual accepts influence because the content of that influence is consistent with the person's value system or with perceived reality. In this case, the issue of whether or not influence is accepted rests upon the utility of the intended change and so the basis of the influence process must involve either the objective validity of the arguments presented when such can be established or the credibility of the communicator when direct evaluation of the communication is not possible.

From this point of view, it is apparent that the process through which agreement is achieved has implications for the quality of the final decision. Only when consensus is a result of internalization by the members will the process of group interaction enhance the group's ability to identify an optimum solution, because this is the only result which implies evaluation of the arguments presented and the credibility of those presenting them. In contrast, the processes involved in producing compliance or identification, while not precluding the selection of an optimum outcome, operate with respect to the group's social context and independently of the intrinsic merit of the possible outcomes. Therefore, they may enhance the group's effectiveness, but they might equally well detract from it. If, then, it is the case that social influence plays a major part in group judgment and decision making, and this major part may be either beneficial or detrimental, a question naturally arises regarding the way in which influence actually operates in

groups.

Majority Influence

Immediately the question of influence in a group setting is raised, the issue of conformity springs to mind. This is hardly surprising, since the phenomenon is so pervasive that everyone has at least occasionally experienced the need to "go along with the rest", to live up to the expectations of others. As a result, the major emphasis of research on social influence has been concerned with the investigation of conformity (cf. Hollander & Willis, 1967; Moscovici & Faucheux, 1972).

In the research literature, conformity has generally been defined as "a change toward a group as a result of real or imagined group pressure." Kiesler & Kiesler, 1969). The classic demonstration of the power of a majority to induce such movement in an individual was presented by Asch (1951). In his classic series of experiments, a number of subjects were asked to compare a reference line of a certain length on one card with three comparison lines of differing lengths on another card held up beside the first. In all cases, one of the comparison lines was clearly the same length as the rest and so the discrimination required was quite simple. However, in actuality all but one of the supposed subjects were confederates of the experimenter, and on certain of the trials they unanimously chose the wrong line. On these trials, faced with the unanimous opinion of the group, subjects conformed to the group judgment on about thirty percent of the trials, and fully seventy-four percent of the subjects conformed on at least one trial. This result has also been shown to obtain when a unanimous majority is as small as three persons (Asch, 1951) and on various other perceptual and judgmental tasks (cf. Krech, Crutchfield, & Ballachey, 1962). Furthermore, the effect is even stronger when the stimulus situation is more ambiguous (e.g., Deutsch & Gerard, 1955).

This research on conformity provides striking evidence of the influence of the majority, evidence which has proven so compelling that it has virtually dominated conceptions of the influence process in groups (see, for example, the weight placed on discussions of conformity in contemporary social psychology texts, for example Aronson, 1972; Baron & Byrne, 1977; Berkowitz, 1975).

This is not to say that conformity is the only or even the most important form which majority influence can take. The majority also wields a potent form of social influence by virtue of the credibility which its numbers give to its beliefs, a factor which in Kelman's (1961) framework would provide a sort of informational influence leading to internalization rather than compliance or identification. Through experience, one learns that in the vast majority of cases the judgments of a number of different individuals concerning questions of physical reality will coincide, and that even when the relevant aspects of the stimulus situation are not clearly defined, those judgments, while showing some degree of variability, will still centre about the true answer (cf. Shaw, 1971. p. 60). Thus the act of deferring to the majority position is not necessarily an abdication of one's intellectual duty, as is often assumed, but a rational response to the information about reality which is contained in a majority opinion. Consider a situation in which individuals must make some decision about a state of nature or an outcome of an event, the validity of which will not be immediately apparent. If each person's personal decision is made independent of the others and has associated with it some non-zero probability of being correct, then the probability that any number who choose the same position are in error (which is the product of the individual probabilities of error) decreases geometrically as their number increases. For example, if ten persons agreed on some point, and each had a 50% chance of being wrong, then the likelihood of them all

being wrong is only 0.1%. Similarly, if some n persons were to judge the value of some characteristic of physical reality (e.g., weight of an object) and their judgments were centred about the true value with a standard deviation of 1 unit, then the standard error of their mean judgment would be only the reciprocal square root of n. In such cases, it is clear that the confidence with which one could espouse a belief would be enhanced considerably if that belief reflected the majority opinion.

This line of reasoning also has its counterpart in terms of nonobjective or social reality (cf. Festinger, 1950, 1954). Many elements in a person's belief structure involve beliefs, attitudes or opinions concerning matters the true state of which cannot be established with reference to empirical data. While the question of objective validity generally does not apply to these elements, they do enjoy a subjective validity depending in large part upon the extent to which relevant others share them, i.e., whether a consensus exists concerning them. It is often said that humans strive to determine the intrinsic properties of the world around them and to acquire veridical perceptions concerning causal relationships and response-outcome contingencies operating in that world (cf. for example, Kelley & Thibaut, 1969, p. 6; Kiesler & Kiesler, 1969, p. 92). Certainly the attainment of such knowledge is adaptive, increasing the predictability of events which concern one and concomitantly reducing uncertainty and its accompanying stress (cf. Seligman, 1975).

There are essentially four ways in which one establishes the level of confidence with which he can view such beliefs (Heider, 1958). The first three are principles of induction which were proposed by John Stuart Mill a century ago, and involve the examination of the conditions associated with the presence, absence and variations of the phenomena of interest. The

fourth, however, is the establishment of consensus, and thus refers not to the relationships between the phenomena and the physical world but to the coincidence of different individuals' perceptions of those relationships. In other words, when the evidence of reason falls short of reducing uncertainty below some arbitrary level, the individual relies upon consensus to define the salient aspects of subjective reality. For this reason, the majority position on an issue can contain a strong informational component which may exert influence entirely independent of any "real or imagined group pressure."

It appears then, that a belief endorsed by a majority exerts substantial influence in a group situation, whether as a result of the majority's wielding of social pressure or the inherent credibility which its numbers lend it, and it is this sort of influence which is invoked most often when social influence is discussed in relation to group dynamics. But is it the weight of numbers which determines influence? What about the influence of the individual on the group?

Minority Influence

It is readily apparent that an individual can sway a majority when that individual possesses some special power by virtue of being a legitimate leader, a controller of effective rewards and punishments, or a recognized expert (French & Raven, 1959). Upon reflection, however, there also appear to be instances where individuals with no such special powers can advance an initially unpopular proposition in the face of majority opposition and can eventually win over or at least profoundly influence that majority (e.g., Copernicus, Marx, Freud, or even Hitler). There are also examples of this occurring in experimental groups, as, for example, when a talkative or highly confident individual induces the rest of a group to accept his position (e.g., Thomas & Fink, 1961; Thorndike, 1938). But it is only recently that this

issue of minority influence has become the subject of psychological research (cf. Moscovici & Faucheux, 1972; Moscovici & Nemeth, 1974) aimed at determining just how it functions, particularly in relation to the apparently substantial power of the majority to prevent such influence.

Two types of paradigm have been used to investigate this phenomenon. The first involves perceptual judgments of colour stimuli, generally pure blue slides of varying luminance. In a typical experiment, Moscovici, Lage and Naffrechoux (1969) had six persons (two of whom were confederates) make colour judgemnts of photographic slides. The subjects were tested for colour vision as a group and then instructed that they would be shown a number of colour slides, to each of which they were to respond aloud, naming the colour of the slide and rating its brightness on a scale from 0 to 5. Six blue slides differing only in luminance were presented six times each in random order for a total of thirty-six trials. Each trial lasted fifteen seconds, and trials were separated by five second interstimulus intervals. This situation is very similar to that used in the conformity research, although the colour discrimination required may be somewhat more subjective than judging line length. The results showed that when only naive subjects are used, the percentage of erroneous colour responses is very low (0.2%), but when confederates who consistently respond with a judgment of "green" on every trial are included, the percentage of errors jumps considerably (to 8.4%). It is this difference that is interpreted as being indicative of minority influence.

One of the critical variables involved in producing this effect is apparently the perceived consistency of the confederates. When they responded with "green" on only two-thirds of the trials and "blue" on the other third, the percentage of "green" responses was only 1.25%. Moreover, this consistency does not necessarily require constancy of the actual response but rather a consistent covariation between response and the stimulus situation. In an

experiment similar to the above, Nemeth, Swedlund, and Kanki (1974) compared five levels of consistency. In three of the conditions, confederates responded "green" on half of the trials and "green-blue" on the other half, with the order of responding either a) random relative to the luminance of the slides, b) correlated with the luminance of the slides, "green" responses being given to the brighter half of the slides or c) correlated with luminance but "green-blue" being given as the response to the brighter slides. In the other two conditions, the confederates' responses were constant, being "blue-green" in one and "green" in the other. The results indicated that while the random order of responding did not affect the naive subjects' responses, both of the correlated conditions produced significant degrees of influence and these conditions did not differ significantly from each other or from the constant "green-blue" condition. This effect was attributed to the fact that the naive subjects reported perceiving the consistent confederates in both the correlated and the repetitive conditions as being more confident and more consistent in their judgments than were the confederates in the random condition.

The results from the second paradigm, which uses a more naturalistic discussion setting, tend to support this interpretation. In one study, Nemeth and Wachtler (1974) had four subjects and a confederate discuss a personal injury case and attempt to reach a consensus on the size of damage award which would be appropriate. On pretesting the issue, it was found that the mean amount which individuals would award was $14,670 and that no one would propose less than $8,000. The confederate, playing the part of a hard-line minority, therefore argued for a $3,000 decision, using the same set of pre-arranged arguments in all groups and never compromising. The manipulation involved whether the confederate chose or was assigned to the seat at the

head of the table or a side seat, and the dependent variable was the extent

to which naive subjects would shift their opinions toward the confederate's.

In this situation, the overt effects of influence were virtually non-existent,

with none of the twenty-four groups reaching a consensus. However, on a

questionnaire following the discussion, subjects in the condition where the

confederate chose the head seat (rather than being assigned to it) admitted

to a significantly greater change in their private opinion in the direction

of the confederate's position than was the case for the control groups. As

in the previous study, on questions regarding the extent to which the other

group members were seen as confident and consistent, the condition which pro-

duced the greatest influence also involved the confederate's being perceived

as most confident and most consistent.

On the basis of these and other studies (e.g., Nemeth & Wachtler, 1973;

Nemeth, Wachtler, & Endicott, 1976), Moscovici and his associates (Moscovici

& Faucheux, 1972; Moscovici & Nemeth, 1974) have concluded that it is behavi-

oral style, a purposeful arrangement of verbal and non-verbal cues, which

determines a minority's success. They see the minority's effectiveness as

stemming from its ability to present a plausible alternative to the beliefs

of the majority, one which requires that majority to reassess the basis of its

own position. By being consistent, confident, and impervious to argument,

the minority prevents the establishment of that consensus which would be ex-

pected to develop around a reasonable belief. This refusal of the minority

to accept the majority's position calls into question the legitimacy of that

position and, as a result, initiates in the majority a search for explana-

tions of the minority's resistance. It is this need to reconcile the assumed

validity of their position with the minority's inability to recognize its

obvious merit that forces the majority to seriously consider the basis of

the minority's opinions. Although this examination of the minority's argu-
ments may be motivated solely by a desire to discredit them, it may also
lead to a recognition of their strengths (if there are any) and thus produce
the eventual acceptance of the minority position by the majority.

Conclusion and Research Problem

In the preceding discussion of social influence in groups, one element
reappears constantly and that is the tendency for groups to converge on a
consensus. Group members tend to move toward consensus when there is no re-
quirement to do so (even attempting to anticipate the responses of others
when they are unknown); conformity is the result of pressures to consensus;
social reality depends upon the establishment of consensus; minority influence
presumes the thwarting of consensus (cf. Brown, 1965, p. 669; Collins & Raven,
1969, p. 173; Kelley & Thibaut, 1969, p. 71; Moscovici, 1974, p. 198). In
view of this, it may be profitable to reconsider the rather diverse findings
presented above in terms of this need for consensus or "consensus seeking."

That consensus seeking operates and that it can be valuable in terms of
facilitating group locomotion, defining reality, and reducing uncertainty
has already been discussed. That conformity is related to that consensus
seeking is also apparent, because the existence of group pressure toward uni-
formity must arise out of a desire to eliminate difference, i.e., to reach
consensus. Similarly, we have already considered non-coercive majority in-
fluence as an instance of consensus seeking and of the validation of beliefs
via consensus. But what of the minority influence literature?

In fact, it appears that what is labeled as minority influence is a
variant of what has been occurring as a result of the consensus seeking pro-
cess in much of the conformity literature, although the meaning of those
results was obscured by the more dramatic conformity effects. Let us

consider consensus seeking in its purest form to be an averaging process by which a number of individual judgments are converted into a group belief. This is basically what occurs in studies of group judgments such as those referred to earlier (e.g.,Gurnee, 1937; Jenness, 1932) which find that the group judgment converges upon the mean of the individual judgments. Using this formulation, if a subgroup of opinions deviated significantly from the modal tendency (i.e., if the distribution of judgments were bimodal and skewed), then one would anticipate that the consensus point would move toward those positions and in fact the results of a study by Jacobs and Campbell (1961) show evidence of this. In order to investigate the transmission of an arbitrarily established norm in the Sherif autokinetic effect paradigm, they had groups of four persons rate the movement of a point of light in a darkened room during a series of trials. Groups of four naive subjects in such a situation would judge the movement to be about 4 inches, but on the first trial, three confederates responded with an average judgment of 16 inches and the lone subject then said, on the average, not 4 but 14 inches. On subsequent trials, one confederate was removed from the group on each trial and a new naive subject introduced so that by the fourth trial the group members were all true subjects but with varying amounts of experience. From this point, at the beginning of each trial the "oldest" subject was removed and replaced with a naive subject. The results clearly favour the operation of consensus. As each new subject was introduced, his influence lowered the normative standard slightly and in a fashion which closely approximated the averaging of each person's previous standard of judgment. It is crucial to note here the function of a confederate in such a scheme. Because they do not move toward consensus in the way actual group members do, they clearly accentuate the operation of social influence defined as an overall shift

toward their position. In fact, subjects desiring to achieve a group consensus have no alternative but to be influenced since the possibility for the converse does not exist.

The application of this idea to the results obtained in the conformity and minority paradigms can account for what otherwise would be considered a paradoxical finding, namely that both majority and minority influence appear to exert effects of the same size and that they do so regardless of the numbers involved in either the majority or the minority. That the influence of a majority remains relatively constant for varying sizes greater than three has already been noted. In addition, though, a very similar result has been found to obtain with respect to minority influence. In a study examining the effects on influence of the size of the minority (from a single confederate to four confederates) against a group of six naive subjects (Nemeth, Wachtler, & Endicott, 1976), it was found that the magnitude of the influence effect was relatively constant across conditions. In other words, neither majority nor minority influence would appear to depend upon the factor of group size per se.

The more interesting aspect of this comparison of majority and minority influence arises in relation to the actual magnitude of influence produced. With a paradigm very similar to that used in minority influence research, the conformity studies have consistently found that as long as the naive subject is not the only person who differs from the majority, then the influence effect hovers around 5% to 10%, which is precisely in the range of what minority influence achieves (cf. Allen, 1975; Moscovici & Faucheux, 1972). In sum, it appears that with the exception of the situation where an isolated individual faces a united majority opposition, a consistently non-compromising coalition of any size can exert influence on a group. While

this effect is very slight (but constant) in a relatively unambiguous Asch-type situation, it can assume major proportions in cases where the correct responses are less easily verified, as, for example, in the autokinetic paradigm referred to earlier (Jacobs & Campbell, 1961).

A plausible explanation for this result appears to be that it reflects the effect of an immovable anchor point on the convergence process. When the stimulus situation is amgibuous, then the stability of this anchor point lends it an appearance of certainty which increases its weight in the averaging process. This, in effect, draws the consensus point toward it. Even when the situation is clearly defined and the erroneous nature of the confederates' responses is obvious, there still exists the tendency to reduce the difference in positions by moving in the direction of a consensus. But here the nature of the problem allows only resistance or submission and thus the effect is reduced (although it is worth noting again that only 25% of the subjects never attempt the reconciliation).

Considered from this point of view, the research on social influence in groups which has relied on confederates appears to have a serious limitation. If it is the case that individuals rely upon each other for information regarding appropriate responses to situations (especially when those situations involve uncertainty) and if this involves a mutual re-evaluation of individual beliefs in light of the informational content provided by others' actions, then it is unlikely that many such situations in real life involve arbitrary and complete intransigence on the part of group members. But this is precisely what the group research with confederates is producing. Because the confederates do not reassess their positions or respond to influence attempts, they must appear as unusually certain of their position and this doubtless lends weight to it. However, even if it did not, the fact still remains that

in order to reach or even approach consensus the only response which the naive

subjects can make is to shift toward the confederate's position, regardless

of their acceptance of it. The research involving totally naive groups strong-

ly suggests that a variety of factors (e.g., volubility, confidence, status,

and so on) can allow an individual to be effective in influencing a group by

increasing the weight which is associated with his position in the averaging

process, and the immovability of the confederate may be one more such tac-

tical variable which affects such a weighting.

The real question, however, is not whether a possible form of behaviour

such as immovability could affect a discussion, but whether in fact it occurs

with any frequency in natural groups. Considering the pressure which is

brought to bear on persons who display such behaviour (e.g., Schacter, 1951),

it seems likely that there are more common forms of influence in groups and

that it would be valuable to test the various conceptions of social influence

in the context of a less artificial situation. In order to avoid the dis-

tortion which may result from non-reciprocal interactions, the research re-

ported below relied upon groups composed entirely of naive subjects. A

problem for discussion was selected which had a continuous numerical scale

of solutions and about which the general population expressed considerable

disagreement. Potential subjects were then pretested in order to determine

their individual opinions on the issue. In this way groups of completely

naive subjects could be constructed in which the differences of opinion formed

distinct factions.

Specific Hypotheses

The study examines five plausible formulations of the influence process

in group decision-making.

Hypothesis I. "Influence by a faction is a function of their solidarity."

A major emphasis of the minority influence literature involves the belief that the influence which a minority wields depends upon their creation in others of the perception that they constitute a coherent sub-group, confident in, committed to and consistent about their position (cf. Moscovici & Nemeth, 1974). It follows then that the effectiveness with which they function as a source of influence depends upon their success in creating this impression. To test this, a measure of perceived group solidarity (or "groupness") was constructed for each faction based on the extent to which the faction's members were perceived as similar by the others on a number of personal characteristics (e.g., likeability, rigidity, willingness to compromise), and this measure was then used to predict the influence of that faction on the members of the other.

Hypothesis II. "Increasing size of a faction is accompanied by an increase in others' perceptions of them as competent and a decrease in perceptions of them as confident."

This follows directly from the results of Nemeth, Wachtler and Endicott's (1976) study which used confederates with pre-determined response patterns as the minority. It seems reasonable to assume that this result should also occur in a natural situation (cf. Allen, 1975, p. 21).

Hypothesis III. "The winner of the first battle will likely win the war."

In much of the discussion of influence, the emphasis on unanimity and consistency implies that a powerful argument against a position relative to an alternative position is the defection of a person from the former to the latter. The fact that a member of one's own group finds an alternative belief system compelling would seem to be strong reason for one to examine one's own justification, and, in fact, the predicted increase in acceptance of influence when a supporter defects has been found (cf. Allen, 1975, p. 31). In the

present study, this is tested in terms of the proportion of groups in which

the final decision favoured the direction in which the first person to change

position did so.

Hypothesis IV. "Group disagreement is solved by compromise."

This alternative to the previous hypothesis is based both on the evidence

of convergence and on the prevalence of compromise as a realistic bargaining

tactic in negotiations. This predicts that the final decision will be located

at the midpoint of the range of the initial positions.

Hypothesis V. "The squeaky wheel gets the grease."

The sheer frequency of communication has been noted as an important vari-

able in group process, both by laymen, as demonstrated by the above aphorism,

and by researchers. Talkative individuals have been found to be influential

(Thomas & Fink, 1961) and control by an individual of the communication in a

group promotes the emergence of that individual as a perceived group leader

(cf. Shaw, 1971, p. 140). In this study, the frequency of communication of a

subgroup is considered as a variable in the prediction of influence, with the

faction which dominates the discussion being predicted to be the most influ-

ential.

II. Method

Issue Selection

An issue was needed which involved an interval scale of measurement in order to measure change in opinion, but for which there was a fairly even dichotomous split of opinion in the population. One such issue was the settlement of wage demands in labour disputes. At the time of the study, Anti-Inflation Board (A.I.B.) regulations in Canada prescribed an 8% limit to wage settlements and it seemed likely that this situation would polarize opinions concerning the settlement of labour disputes. People who supported the aims of the A.I.B. would be expected to support low (8% - 12%) wage increases in a wide variety of situations, while those opposed to the A.I.B. would likely reject their suggestions and support much higher wage settlements. Pretesting of this issue showed that there was indeed such a split of opinion and so this issue was used in the study.

Subjects

Subjects were 106 female undergraduates at the University of British Columbia. As part of a procedure ostensibly to gather normative data on opinions of university students, a large number of undergraduates were pretested on an issue involving the settlement of a labour dispute. The students were also asked to include their name and telephone number if they would be interested in taking part in a future experiment. Later, those females who had indicated a willingness to participate and whose responses to the pretest question were either low (8 - 12%) or high (30 - 40%) were contacted and asked to participate in a group discussion experiment intended to examine the ways in which groups of people make decisions. Students who agreed to take part were then given a choice of occasions for their participation and asked to select the date and time which would be most convenient. The alternative occasions

with which a given subject was presented varied according to the subject's

opinion and the number of subjects from each opinion group already booked. In

general, at least five persons with high opinions and three with low opinions

were scheduled for each experimental session. Although only six subjects

were needed for each group, eight to ten were scheduled in an attempt to al-

low for changes in opinion and failures to appear. The extra subjects in

each group served as observers. The composition of each group is given in

Table 1.

Materials

Opinion Survey. The initial screening measure was an opinion survey with

four items on it. Students were asked to give their estimate of a fair solu-

tion to a question of child support following divorce, a wage settlement in

a labour dispute, a damage award in a negligence law suit, and an alimony

award following a divorce. In addition, the form had space for the name and

telephone number of each person and some information about when he or she

would be free to participate in an experiment on a voluntary basis.

Posttest. Because this was an observational study, data on a variety

of items were collected. A Discussion Information Form, which was given to

all subjects following the discussion, provided for the following information

to be recorded:

    a) the final decision.

    b) the subject's personal opinion (for comparison with the group decision).

    c) the subject's recollection of each person's original position.

    d) the initial range of opinion in the group - in order to see whether

there were any naturally occurring sub-groups.

    e) the reasons, if any, for their change in opinion.

    f) which subjects changed their opinions, in what order, and in which

direction.

Table 1

Initial Group Compositions

Group	Initial Positions						No. of Observers
1	8	12	20	20	20	24	2
2	8	8	12	12	20	20	1
3	8	12	12	16	20	20	0
4	8	12	12	16	20	28	0
5	12	16	16	20	20	24	0
6	16	16	20	20	24	28	2
7	16	16	16	20	40	40	3
8	8	16	20	24	24	40	0
9	12	12	16	24	24	28	0
10	8	12	12	20	24	24	1
11	12	16	20	24	24	24	1
12	8	8	8	16	16	32	0
13	8	12	12	20	20	24	2
14	8	12	12	12	16	28	2
15	8	8	8	24	28	32	2

g) where each group member fell on eleven semantic differential scales involving reasonableness, confidence, consistency, willingness to compromise, intelligence, likeability, leadership, rigidity, knowledgeability, personability and interpersonal attraction.

h) which group members seemed most compatible with each of the others - another attempt to assess natural intragroup categorization.

i) four opinion questions involving labour management issues.

j) a generalization case consisting of a situation similar to the one discussed but different in specific details. This was intenede to assess the subject's change in opinion on the issue of labour-management relations due to the discussion experience as opposed to the change in opinion regarding the particular situation discussed.

Copies of both the pretest and the posttest are included in Appendix A.

Experimental Setting

The group discussions were conducted in a large room with an observational glass in one wall. There was a single large table in the centre of the room and a number of chairs spaced around the perimeter. On the table were place cards numbering six seating positions on three sides of the table, with the side facing the mirror left empty.

Behind the observational glass was an observation room. A microphone above the discussion table was connected to an amplifier in the observation room, allowing the experimenter and an assistant to hear and record the group discussion.

Procedure

When the subjects arrived at the room, they were seated at some distance from each other around the room and asked not to converse prior to the start of the experiment. When all subjects had arrived, they were given the

following story to read and asked to circle the percentage at the bottom

which best approximated their own personal opinion:

> A labour dispute between a major university (not U.B.C.) and its
> food services staff has been submitted for binding arbitration. The
> previous two year contract, which expired four months ago, had provided
> wage increases which barely met the rate of inflation and thus the food
> services staff made no real gains during the past two years. Therefore,
> their union has asked for a 40% increase over one year, a sum which
> will bring the workers up to the level of pay enjoyed by those doing
> similar work at other places.
> The university opposes such an increase for a number of reasons.
> Recent increases in costs and sharply reduced government funding have
> seriously curtailed the university's educational programs, and forced
> many cutbacks and economy measures. Thus this is a particularly bad
> time for it to meet a large increase in its payroll. Also, although
> universities are not necessarily subject to wage and price controls, it
> is felt that any increase over 8% at this time will adversely affect pub-
> lic confidence in economic restraints because the university is almost
> entirely supported by government dollars.
> If you were appointed arbitrator of this dispute, with complete
> authority to impose a settlement which would be honored by both sides
> for one year, what percentage increase would you allow the union? Assume
> that a cost of living allowance will be included on top of the percentage
> increase.

(Circle one)

8%   12%   16%   20%   24%   28%   32%   36%   40%

When they had all given an opinion, the experimenter collected the sheets,

surreptitiously noting the numbers marked on them. On the basis of these

responses the experimenter noted which six had maximally dissimilar opinions.

These were chosen to be the six discussants.

At this point the experimenter explained that he required six persons

as discussants and that the others would act as observers. Indicating (ap-

parently at random) the subjects not selected to serve in the discussion, the

experimenter had them follow the assistant out of the main room and into the

observation room. There the assistant explained that this part of the study

dealt with impression formation. They were told that they should observe the

discussion in the next room and that at the conclusion they would be asked

some questions regarding their perceptions of the discussion and their im-

pressions of the people involved.

Meanwhile, the experimenter began the experiment. The six subjects were asked to sit at the table, and when they were seated they were instructed as follows:

> We are interested in the process of group discussions. Increasingly, a good many of the important decisions which affect our daily lives are the products of groups - civic by-laws, university course requirements, and student aid policies to name just a few - and we would like to find out something about how such groups come to their decisions. So what we want to do is create a group discussion setting of this sort and investigate its dynamics.
> I'd like you to discuss as a group the situation you have just read. First, perhaps you should introduce yourselves to each other. Your name is ____? (indicating each subject in turn). Now, as I said, I would like you six people to discuss the issue before you as though you were an impartial arbitration board, called upon to make a fair decision regarding the percentage increase the union should receive. That is, all of you should agree on the amount which you consider fair and appropriate. Let's first see if there is anything to discuss. We'll go around the table and I'd like each of you to state aloud the percentage you've written down. Let's start here. (Again, the experimenter indicates each subject in turn.) Let's go over those again. (The experimenter states each person's opinion aloud.) You said ___%; You said ___%; etc.
> Now, please discuss the case before you as though it is a real dispute and you are the actual arbitration board, charged with delivering a decision binding on both parties. Try to come to what all of you consider to be a proper settlement, and remember that your decision must be unanimous if it is to be implemented. You'll have twenty-five minutes to discuss the case, and at the end of that time I'll return to see what you have decided.
> Again, it is very important that you treat this as a real situation. Please take this very seriously.

During the discussion, the experimenter and assistant, watching from the observation room, recorded each remark made by the subjects on coding sheets divided into five columns, representing five minute blocks of time, and six rows, one for each person in a group. On the sheets, the initial position, final position and all remarks made during the discussion were recorded for each subject. Remarks were coded as to whom they were addressed (by seat number) and whether they favoured a high (H) or low (L) settlement. Time to consensus in minutes and final agreement in percentage were also recorded on those sheets. When a consensus was reached, or at the end of the twenty-five minutes, the

experimenter re-entered the room and had the participants fill out the Dis-

cussion Information Form. At the same time, the assistant gave the same

questionnaires to the observing subjects.

When the questionnaires were completed, the observing subjects were

returned to the discussion room, a limited version of the hypotheses of the

study was disclosed and any questions were answered.

III. <u>Results</u>

Before turning to the results of the data analyses, a few words con-
cerning those analyses are in order. Because the research reported here is
observational, involving no manipulation of conditions, the traditional con-
cepts of "independent" and dependent" variables do not apply. Instead, all
the variables are observed variables which take on obtained rather than pre-
scribed values. The result is that the task of data analysis becomes one
not of assessing the status of causal hypotheses but rather of investigating
the existence and nature of relationships between variables or groups of vari-
ables. The emphasis, therefore, is on determining what factors covary in the
situation and in what ways.

While this is a valid approach for dealing with a situation in which the
natural structure of relationships is of interest, it does give rise to two
particular problems with regard to the inferential status of the results. The
first problem arises from the nature of the multiple regression model which
is used to analyze such data. The method involves expressing some criterion
(or "dependent") variable as a linear combination of a set of predictor vari-
ables, with the predictors being weighted in such a fashion that the average
squared error of prediction <u>in the sample</u> is minimized. The problem is that
in developing the weights, the zero-order correlations between variables are
treated as being error free. This results in a certain amount of capitali-
zation on chance, which in turn inflates the obtained multiple correlation
coefficient ($\underline{R}$). As a result, the proportion of the variance (expressed as
$\underline{R}^2$) in the criterion variable which can be accounted for by knowledge of
the predictor values is higher in the sample than would be the case for the
population as a whole (cf. Darlington, 1968; Kerlinger & Pedhazur, 1973).
In order to estimate the actual proportion of the variance which those pre-

dictors can account for in the population, the obtained sample value must be

"shrunken" (Wherry, 1931) to give

$$\hat{R}^2 = 1 - (1 - R^2) \cdot \frac{N - 1}{N - K - 1} ,$$

N = sample size
K = number of predictors

In what follows, whenever an $\underline{R}^2$ value is given, it will be accompanied by the $\hat{R}^2$ value in parentheses, but in all cases the associated $\underline{p}$ values will be based on the sample value.

The second problem concerns the experimentwise Type I error rate. Again, because this research is observational, the idea of testing a null hypothesis and either rejecting or failing to reject that hypothesis in light of the obtained test statistic is not entirely appropriate. When a number, $\underline{n}$, of such accept-reject decisions are to be made during the analysis of a set of data, there are good reasons for basing each individual decision on a much more stringent criterion (e.g., $\underline{\alpha}/\underline{n}$) than would be used if only a single decision were made, thus attempting to control the number of erroneous decisions reached (cf. Ryan, 1959). However, in a situation such as this where the object of the data analysis is to discover the nature of the relationships existing in the data rather than to test hypotheses, such a conservative strategy would be decidedly disadvantageous. In this case, a more reasonable approach is to examine all the comparisons of interest and to attempt to assess their relative strengths. For this reason, we prefer to avoid the issue of error rates by treating the $\underline{p}$ value associated with a given statistic as the partial integral of the probability density function of that statistic under the null hypothesis of no relationship (or no difference) rather than as the probability that the decision indicated is erroneous (cf. Rozeboom, 1960). For most statistics, then, the exact $\underline{p}$ values will be reported as obtained, and these will be treated as indicators of the relative plausibility of the null hypothesis in light

of the obtained results.[1]   In this way the results can be interpreted both

individually and in relation to each other, although actual decisions re-

garding the relationships cannot be made.   The only exception to this practice

will be made with $\underline{t}$-tests, which will be reported in the customary terms.

General Results

Ten of the fifteen groups reached a decision during the twenty-five

minute discussion.   The means and standard deviations of opinions in each

group on the Opinion Survey, pretest, posttest (Q. 2) and generalization ques-

tion (Q. 13) are presented in Table 2.   The first result to note is that the

Opinion Survey question was an unreliable indicator of responses to the pre-

test which was used to select discussants.   The average difference between

the two sets of means was sizeable ($\overline{X}_D$ = 3.49) and statistically significant,

$\underline{t}$ (14) = 2.94, $\underline{p} \leqslant .02$ (two-tailed).   Also, the average difference between the

pretest and posttest means ($\overline{X}_D$ = 1.89) was significant, $\underline{t}$ (14) = 2.87, $\underline{p}$ < .02

(two-tailed), but that between the Opinion Survey and the generalization ques-

tion ($\overline{X}_D$=1.35) was not; $\underline{t}$(14) =1.29, $\underline{p}$ >0.20 (two-tailed).

Differences were also apparent in the variability of group opinions on

the various measures.   The variances were normalized via the cube root trans-

formation (Wilson & Hilferty, 1931) and then analyzed in one-tailed paired

sample $\underline{t}$ - tests of the difference.   The results showed that the variance of

opinions was significantly smaller on the posttest than on the pretest, $\underline{t}$ (14)=

-5.06, $\underline{p}$ < .001, and also significantly less on the generalization question

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[1] It would have been preferable to report confidence intervals around the obtained statistics, thus compactly expressing the range of plausible hypotheses concerning the true population parameter.   This was not done simply because there is no currently available technique for establishing such intervals about the squared multiple correlation coefficients which constitute the bulk of the statistics reported.

TABLE 2

Group Means and Standard Deviations

Group	Opinion Survey Mean	Opinion Survey S.D.	Pretest Mean	Pretest S.D.	Posttest(Q.2) Mean	Posttest(Q.2) S.D.	Generalization question(Q.13) Mean	Generalization question(Q.13) S.D.
1	13.33	6.29	17.33	5.50	14.67	3.77	12.50	3.82
2	19.83	11.29	13.33	4.99	11.33	4.85	10.83	1.86
3	13.50	6.68	14.67	4.42	12.67	2.21	12.83	2.27
4	13.00	5.00	16.00	6.53	14.00	1.15	12.00	2.83
5	12.67	5.37	18.00	3.83	18.67	2.98	15.00	4.12
6	11.83	4.49	20.67	4.27	18.33	2.92	16.00	4.16
7	14.83	7.03	24.67	10.93	24.00	6.11	19.67	9.34
8	13.17	6.79	22.00	9.73	19.33	2.75	11.83	4.56
9	15.00	6.51	20.00	6.93	18.67	5.50	11.50	1.80
10	12.00	5.65	16.67	6.29	12.67	3.59	10.17	2.34
11	11.67	6.18	20.00	4.62	20.00	2.31	13.00	3.65
12	16.50	6.78	14.67	8.54	16.00	0.00	12.00	2.00
13	13.33	4.99	16.00	5.66	10.67	1.89	11.00	2.00
14	14.67	6.10	14.67	6.39	16.67	1.49	15.17	4.81
15	19.00	10.44	18.00	10.26	10.67	4.42	10.50	1.12
Overall Means	14.29	6.57	17.78	6.48	15.89	2.86	12.93	3.22

than on the Opinion Survey, $\underline{t}$ (14) = -4.19, $\underline{p}$ < .001. Comparisons between

the variances on the Opinion Survey or the generalization question and those

on the pretest and posttest were not made because the issues with which the

two pairs of questions dealt were formulated quite differently. Many more

details of the dispute in question were presented for the pretest and post-

test issue, and this difference in the information available about the situ-

ations would likely affect the variances of opinion concerning them, thus

confounding any comparisons made between them.

Specific Hypotheses

All of the specific hypotheses outlined in the Introduction involve the ex-

amination of intra-faction influence within groups. For the purposes of the an-

alysis, each group was split into two subgroups in two different ways, accord-

ding to two different criteria. Then identical analyses were done for both

partitionings.

The first partitioning was done on an a priori basis. On the strength of

the pretest responses, groups were split into "high" and "low" subgroups. Those

who expressed opinions of 12% or less were placed in the low subgroup while

those who responded with 16% or more became members of the "high" subgroup.

There were two necessary exceptions to this rule since for two of the groups,

16% was the lowest opinion expressed (see Table 1). In one of them, Group 6,

the two subjects who responded with 16% became the "low" subgroup. In the other,

Group 7, there was a clear split between four subjects who expressed opinions

of 16% -20% and two whose opinion was 40% and on this basis the two 40% sub-

jects became the "high" subgroup.

The second partitioning was done sociometrically. Question 8 on the post-

test asked each group member to identify which of the group's members seemed to

belong together, and the responses to this question were analysed to identify

two sociometrically distinct factions. These procedures yielded the two sets

of thirty subgroups which formed the basis for the subsequent analyses (see

Table 3 for the opinion composition of subgroups under each partitioning).

The means, standard deviations and correlation matrices for all the variables

used in the analyses are included in Appendix B, separately for each parti-

tioning.

Hypothesis I. "Influence by a faction is a function of their solidarity."

Subgroup solidarity was conceptualized as the extent to which subgroup members

were seen as being similar along a number of dimensions. This was operation-

alized by finding the variance of the perceptions of one subgroup's members

as reported by the members of the opposing subgroup for each item of Question

7 of the posttest and then summing over the eleven items to yield a measure

of "groupness" (GRP). This measure then reflected the heterogeneity of the

subgroup members over those eleven items, with a subgroup's score on the GRP

variable increasing as its members were seen as more heterogeneous by the

members of the other subgroup. A more detailed description of the computation

of this and other indices is included in the Appendix.

The criterion variable, Influence, was operationalized in two ways. The

first measure, Infl 1, was constructed for a given subgroup by taking the abso-

lute value of the sum of the signed changes in the opinions of the other sub-

group's members (measured from the pretest to the final decision) and dividing

by the number in the other subgroup. The ten subgroups contained in groups which

did not reach a decision were treated as having missing data on this measure.

The second measure, Infl 2, was constructed to provide an indicator of influence

in the private opinions of group members. This was calculated by taking the ab-

solute value of the sum of the signed changes in the opposing subgroup's opin-

ions (measured from the pretest to the generalization question) and dividing

by the number summed over. This measure could be calculated for all subgroups.

Four regression equations predicting influence from GRP were then derived,

Table 3

Subgroup Composition Under Different Partitionings

Group	Sociometric I	Sociometric II	A Priori I	A Priori II
1	12,20,20	8,20,24	8,12	20,20,20,24
2	8,8,12,12	20,20	8,8,12,12	20,20
3	8,12,12,20	16,20	8,12,12	16,20,20
4	8,16,20	12,12,28	8,12,12	16,20,28
5	12,16,24	16,20,20	12	16,16,20,20,24
6	16,16,24,28	20,20	16,16	20,20,24,28
7	16,16,16,20	40,40	16,16,16,20	40,40
8	8,16,20	24,24,40	8	16,20,24,24,40
9	12,12,16,28	24,24	12,12	16,24,24,28
10	8,12,12,20	24,24	8,12,12	20,24,24
11	12,16,20	24,24,24	12	16,20,24,24,24
12	8,8	8,16,16,32	8,8,8	16,16,32
13	8,12,20	12,20,24	8,12,12	20,20,24
14	8,12,12	12,16,28	8,12,12,12	16,28
15	8,8	8,24,28,32	8,8,8	24,28,32

the results of which are summarized in Table 4. It can be seen that the only instance in which the predictor accounts for a substantial proportion of the variance is in the prediction of Infl 1 under the sociometric partitioning. Upon examination of the standardized regression coefficient (the beta weight) however, even this result does not appear to be a predicted. Since the variable, GRP, increases as the variance among subgroup members increases, it should be negatively related to influence. Contrary to this, it is in all cases positively related to influence in these equations.

Hypothesis II. "Increasing size of a faction is accompanied by an increase in others' perceptions of them as competent and a decrease in perceptions of them as confident." The measures of perceived confidence (CONF) and competence (COMP) for a given subgroup were calculated by summing the respective scores for each member of that subgroup as reported by each member of the opposing subgroup and then dividing by both the number in the former subgroup and the number in the latter. Four regression equations which predicted either confidence or competence from size of the subgroup were developed, the results of which are summarized in Table 5. These results indicate that the size of the subgroup was almost completely unrelated to the other subgroup's reported perceptions of their confidence or competence.

Hypothesis III. "The winner of the first battle will likely win the war." This hypothesis was evaluated in a number of ways. The first and most obvious was a straight test of the proportion of groups in which the faction which won the first convert was also the most influential. Two dichotomous measures of the winning of a first convert were constructed, the first (CVRT1) indicating which was the first group to have a member change position, the second (CVRT2) indicating which subgroup was first to lose a member to the opposing subgroup. The latter measure could only be constructed for the a priori partitioning,

Table 4

Hypothesis I: Influence as a Function of Solidarity

Sociometric Partitioning

Criterion	Beta	R^2 $(\hat{R}^2)$	F	p
Infl 1	.506	.256 (.215)	6.194	.023
Infl 2	.262	.069 (.036)	2.070	.161

A Priori Partitioning

Criterion	Beta	R^2 $(\hat{R}^2)$	F	p
Infl 1	.361	.131 (.082)	2.705	.117
Infl 2	.141	.020 (.000)	0.568	.457

Note. In the case of a single predictor, the multiple regression equation is equivalent to a bivariate regression equation, and the reported Beta, R^2, and F values correspond to bivariate r, r^2, and t^2 values.

Table 5

Hypothesis II: Confidence and Competence as Functions of Size

Sociometric Partitioning

Criterion	Beta	R^2 $(\hat{R}^2)$	F	p
CONF	-0.049	.002 (.000)	0.068	.797
COMP	-0.127	.016 (.000)	0.461	.503

A Priori Partitioning

Criterion	Beta	R^2 $(\hat{R}^2)$	F	p
CONF	.136	.019 (.000)	0.530	.473
COMP	.077	.066 (.000)	0.166	.687

since under the sociometric partitioning most subgroups did not define a clear position on the scale. In testing the proportion of groups in which the movement of a member of one subgroup coincided with that subgroup's having relatively less influence on the final decision (calculated on the basis of the Infl 1 measure of Hypothesis I), it was found that none of the obtained values approached what would normally be considered significance. Under the sociometric partitioning, the proportion was exactly .5 ($\underline{p} \geqslant$ .20), while under the a priori partitioning they were .33 ($\underline{p}$ > .16) and .67 ($\underline{p}$ > .16) for the first and second indicators respectively.

In order to assess whether the above dichotomization of the influence measure into simply "more" or "less" influential had obscured the relationship between movement of group members and influence, the indicators of movement were also used as predictors of the original measures of influence from Hypothesis I. This procedure resulted in six regression equations which are summarized in Table 6. Under the sociometric partitioning, the results were not impressive, as the single predictor, CVRT1, accounted for less than 5% of the variance in both cases. Under the a priori partitioning, however, there was a considerable relationship. For these equations, the two predictors were entered step-wise, with the one having the highest zero-order correlation with the criterion being entered first. The results show that CVRT2 was the best predictor of Infl 1 while CVRT1 was the best predictor of Infl 2, and that when both variables are used as predictors, they accounted for a very substantial proportion of the variance in Infl 2 (56%) and a lesser but still significant proportion of the variance in Infl 1 (34%).

Hypothesis IV. "Group disagreement is solved by compromise." This hypothesis was tested in three ways, each of which produced similar results. If the midpoint of the group members' opinions is defined as the mean of those

Table 6

Hypothesis III: Influence as a Function of Movement

Sociometric

Criterion	Beta	R^2 $(\hat{R}^2)$	F	p
Infl 1	-.066	.004 (.000)	0.104	.756
Infl 2	.218	.047 (.011)	1.293	.266

A Priori

Criterion	Predictor	Beta	R^2 $(\hat{R}^2)$	F	p
Infl 1	a) CVRT2	.428	.183 (.132)	3.593	.076
	b) CVRT2	.618	.344 (.257)	3.935	.042
	CVRT1	-.444			
Infl 2	a) CVRT1	.689	.475 (.454)	23.483	.0001
	b) CVRT1	.551	.559 (.524)	15.842	.0000
	CVRT2	.322			

opinions, then, from the $\underline{t}$-test cited in the General Results section above,
it is clear that the group's central tendency after the discussion was sig-
nificantly different from that at the beginning, $\underline{t}$ (14) = 2.87, $\underline{p}$ < .02.
Similarly, if the midpoint of the range is used as the measure of central
tendency, the pretest and posttest opinions again differ significantly,
$\overline{X}_D$ = 2.267, t (14) = 3.011, $\underline{p}$ < .01. Finally, if we consider only those
groups which actually reached a decision, that decision also differs signi-
ficantly from the initial midpoint of the range of opinions, $\overline{X}_D$ = 2.20,
$\underline{t}$ (14) = 2.40, $\underline{p}$ $\leq$ .05.

Hypothesis V. "The squeaky wheel gets the grease." During the discus-
sion, both the experimenter and the assistant independently recorded each
instance of a group member speaking. Since the correspondence between these
two records was quite high ($\underline{r}$ = .89), they were averaged to yield a measure
of frequency of communication for each subject. Two measures of frequency
of communication by a subgroup were then calculated, one (TALK 1) the sum of
the members' individual scores and the other (TALK 2) the average of those
scores for that subgroup. These were then entered step-wise into regression
equations predicting influence (Infl 1 and Infl 2), with the best single pre-
dictor entering first. The results appear in Table 7. Although none of these
equations accounted for a very significant proportion of the variance in the
criterion variable, there is one aspect of these figures worth noting. The
Beta weights indicate that the two variables, TALK 1 and TALK 2, affect the
criterion variable in opposite ways, even though they were positively cor-
related with each other and their zero-order correlations with the criterion
variables were always of the same sign. In these equations, influence in-
creases as total frequency increases and as average frequency decreases.

Other Results

As a final way of assessing the relationship between influence and the

Table 7

Hypothesis V: Influence as a Function of Communication Frequency

Sociometric

Criterion	Predictor	Beta	R^2 $(\hat{R}^2)$	F	p
Infl 1	a) TALK2	-.288	.083(.032)	1.624	.219
	b) TALK2	-.659	.137(.036)	1.352	.285
	TALK1	.438			
Infl 2	a) TALK1	.232	.054(.020)	1.595	.217
	b) TALK1	.672	.131(.066)	2.027	.151
	TALK2	-.520			

A Priori

Criterion	Predictor	Beta	R^2 $(\hat{R}^2)$	F	p
Infl 1	a) TALK1	.252	.063(.011)	1.218	.284
	b) did not enter *				
Infl 2	a) TALK1	.102	.010(.000)	0.293	.592
	b) did not enter *				

* The second variable was not entered if its contribution to the prediction had an associated F ratio of less than 1.

various dependent variables in the study, four step-wise regression analyses were conducted, each using all the variables as possible predictors and se-lecting the best four predictors sequentially in the order of their contribu-tion to increasing the accuracy of prediction. In addition to the predictor variables referred to previously, the variance measures on each of the eleven items (A to K) of Question 7 which had been used to construct the GRP variable were also allowed to enter as individual predictors. Table 8 contains the results. It lists the predictors for each equation in the order in which they entered and the squared multiple correlations, the $\underline{F}$, and the $\underline{p}$ values which were obtained at each step. In addition, the beta weights which each variable was assigned in the final equation and the partial $\underline{F}$ values (which represent the $\underline{F}$ ratios associated with the decreases in the unexplained vari-ance which each would cause if entered last) and associated $\underline{p}$ values are in-cluded. These last can be loosely interpreted as indicators of the relative importance of variables in predicting the criterion, although when the variables are not uncorrelated, the meaning of an assignment of a given proportion of the variance to any one variable is ambiguous (cf. Darlington, 1968, p. 169).

In general, the results in Table 8 are heterogeneous. The first result to note is the strength of the relationships. In all cases, the proportions of the variance accounted for by the four predictors are sizeable (from 39% to 82%), and remain so even after allowing for shrinkage[2]. In fact, in all

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[2]The $\underline{R}^2$ values obtained are certainly considerably inflated as a result of the capitalization on chance involved in selecting a set of four predictors from a much larger set (19). Even the shrinkage correction does not take into account the effects of a stepwise selection procedure on this capitalization, and so the $\hat{\underline{R}}^2$ values are also inflated to some extent. The result is that the absolute magnitudes of the reported pro-portions of variance accounted for are virtually meaningless for the purpose of generalization to population values. However they can and will be used for comparisons within the sample.

Table 8

Influence as a Function of the Four Best Predictors

Sociometric

Criterion	Predictor	Beta	$R^2(\hat{R}^2)$	F	p	Partial F	p
Infl 1	I(knowledgeability)	.314	.343(.302)	8.339	.011	1.938	$\geqslant$.05
	B(confidence)	.406	.435(.360)	5.775	.014	3.007	$>$.05
	CONF	.349	.489(.379)	4.465	.021	2.773	$>$.05
	COMP	-.284	.553(.415)	4.019	.025	1.860	$>$.05
Infl 2	I(knowledgeability)	.244	.125(.092)	3.722	.065	1.748	$>$.05
	CVRT1	.503	.225(.163)	3.634	.041	7.635	$\lessgtr$.025
	SIZE	.409	.321(.236)	3.786	.024	4.729	$<$.05
	J(sociability)	.288	.392(.287)	3.711	.018	2.687	$>$.05

A Priori

Criterion	Predictor	Beta	$R^2(\hat{R}^2)$	F	p	Partial F	p
Infl 1	B(confidence)	1.098	.354(.314)	8.782	.009	18.252	$<$.01
	G(leadership)	-.849	.552(.492)	9.248	.002	11.156	$<$.01
	CVRT2	.478	.627(.547)	7.841	.003	7.424	$<$.025
	CVRT1	-.369	.727(.643)	8.662	.001	4.779	$<$.05
Infl 2	CVRT1	.952	.475(.454)	23.483	.000	44.612	$<$.01
	SIZE	.443	.610(.579)	19.539	.000	11.768	$<$.01
	COMP	-.510	.755(.724)	24.590	.000	23.882	$<$.01
	CVRT2	.336	.815(.783)	25.347	.000	7.535	$<$.05

but three of the equations a single variable accounts for slightly more than 34% of the variance. A second general result is the fact that the prediction of either variable is better under the a priori partitioning than under the sociometric partitioning, although the relative orders of predictability are reversed. Under the sociometric partitioning Infl 1 is clearly more predictable than is Infl 2 (55% vs. 39% respectively), while the opposite is true for the a priori partitioning (73% vs. 82% respectively).

At the level of the individual variables in the equations, the results are quite diverse. The equations predicting Infl 2 under the two conditions have two variables, CVRT1 and SIZE, in common and in both the former (CVRT1) is the most useful of the four variables in the final equation. However, neither is important in the prediction of Infl 1, with SIZE not appearing at all and CVRT1 appearing only as the least useful of the predictors of that variable in the a priori condition. On the other hand, the two equations for Infl 1 share only one variable, B (confidence variance), which, while it is most important in both of the cases, appears in neither of the Infl 2 equations. A similar result holds true for predicting the different measures within a condition. Under the sociometric partitionings, the predictors are quite different, with only the least important, I (knowledgeability variance), being held in common. Under the a priori condition, two variables, CVRT1 and CVRT2, are common but both their orders of importance relative to each other and their status in relation to the other variables are different with respect to the two different equations. In summary, it appears that differences in the influence of subgroups can be accounted for by the observed variables, that this is more evident in the case of influence on the private opinions of the subgroup members (Infl 2) and under the a priori partitioning, and that different variables are important in relation to different measures of

influence. On the other hand, it does not appear that the same variables are necessarily important either in relation to the same measures under different conditions or the different measures within a condition.

IV. <u>Discussion</u>

In view of the results presented in the previous chapter, what conclusions can be drawn concerning the process of social influence in small group decision making? Unfortunately it must be said that the answer to this rather central question is far from certain. For one thing, the results, being somewhat diverse, do not readily lend themselves to a straightforward interpretation. In addition, there are methodological considerations arising from the sample size and the between group variability which may limit the generalizability of those conclusions which do appear to be warranted by the data. Because of this dual nature of the difficulties presented by the data, the following discussion of the results will be separated into two parts in an effort to simplify the task of interpreting those results.

The first part will consist of a summary of the results of the data analyses and an attempt to interpret them as though they faithfully reflected the relationships existing in the population. That is, the question of the epistemic status of the results will be held in abeyance while possible interpretations of the results are considered. The second part will then present in some detail the limitations of this treatment of the data, thus putting the generalizability of the results into a properly conservative perspective. By proceeding in this fashion, it is hoped that the reader will obtain both a complete picture of the observed relationships in the data and a proper basis for assessing their validity.

<u>Interpretations</u>

Taken at their face value, then, the results indicate a number of things. As expected, the group discussion resulted in a convergence of both the public judgments and the private opinions of the group members, a fact reflected by the reduced variability in these measures following the discussion.

Moreover, it does not appear that this convergence was simply a matter of each

individual member compromising slightly in order to reach agreement. Were

that the case, one would expect that the opinions expressed in the discussion

would converge on some central value while the private opinions remained un-

changed. On the contrary, the results obtained for the fourth hypothesis show

that the central tendency of group opinion (whether defined as the mean or

the midpoint of the range) shifted significantly from the initial to the final

measure and that this occurred with regard to both the issue discussed and

the generalization question. In short, it appears that some sort of social

influence did take place during the discussions.

With regard to the specific hypotheses, the results are fairly unequi-

vocal, although their common interpretation is not immediately apparent. For

the first hypothesis, it appears that subgroup solidarity, as indicated by

the covariance of the subgroup members on the person-perception measures,

does not enhance influence but rather the reverse. While the "groupness"

variable could account for a moderate proportion of the variance in influence,

the way in which it did so was exactly opposite to that predicted. On the

basis of these data, it appears that factions which are perceived by others

as more heterogeneous on the characteristics measured will also be more in-

fluential in a group discussion. In fact, a glance at the correlation mat-

rices included in Appendix B will show that, in every case, the measures

of variance on the person perception scales are positively correlated with

influence.

The second and the fifth hypotheses also fared rather poorly. With re-

gard to the former, in this set of data at any rate, confidence and competence

were not only unrelated to the size of a subgroup but were also positively

related to each other. Both of these results are opposite to those predicted

by the findings of Nemeth, Wachtler, and Endicott (1976) cited in the Intro-
duction. As for the latter hypothesis, it was found that the frequency of
communication by a subgroup, whether total or averaged, was clearly (in fact,
almost completely) unrelated to influence as it was measured in this study.
This result is again opposite to what was expected. Intuitively, it seems
reasonable to expect that the more vocal are the members of a subgroup, the
more influential will that subgroup be but such was certainly not the case
in this situation.

For the remaining two hypotheses, the results were quite substantial, in
one case supporting the hypothesis while in the other discrediting it. As
noted above, the fourth hypothesis, which predicted compromise as the means
through which opinion change would occur, does not appear tenable. By any
measure, the groups did not apparently use compromise as a solution to their
disagreement. Consequently, it is only the remaining hypothesis, Hypothesis
III, which received support from the data. The results for this hypothesis
indicate that when groups are partitioned into subgroups on the basis of their
initially expressed positions, then a knowledge of which subgroup first ex-
hibits movement (whether or not toward the other subgroup's position) will
allow a reasonably reliable prediction of the magnitude of the influence which
that group will wield with respect to both the final decision of the group
and to the personal opinions of the group members. As was predicted, the
subgroup which first exhibits such movement is the less influential.

To this point, the results, while somewhat unexpected, do not appear
problematical. There are, however, two problems which remain to be dealt
with. The first is the failure to find support for the first and fifth hy-
potheses. It seemed that there were sound reasons to expect that these hy-
potheses would have held true in this situation, and their failure to do so

should be explained. The second problem arises in relation to the "Other Results" section included at the end of the preceding chapter. Upon asking a perfectly reasonable question - "Which of the available variables most successfully account for the differences in influence between subgroups?" - we received four different answers, one for each measure of influence under each condition. It is true that these equations are not highly reliable[1], and this combination of unreliability and apparent inconsistency would seem to justify the dismissal of these last results. Upon reconsideration, though, they suggest an interpretation of the influence process which can account for all of the data obtained.

In three of the four equations, the best single predictors or pairs of predictors involve just those factors which one would expect to predict _individual_ influence (i.e., confidence, knowledgeability, leadership) although, in this case, they represent subgroup variance rather than high scores on those factors. Consider, then, the possibility that there may be influential individuals as well as influential factions in a group discussion. In a situation where the various group members are mutual strangers and the opportunities for interaction are limited (as was the case here), it may well be that it is largely as individuals rather than as members of a certain faction that the group's members influence each other. In support of this contention that the factions were not particularly salient in this study, note that the subjects themselves only twice partitioned their groups into subgroups along the lines of opinion differences. Thus it may be that the extent of influence evident in a particular group is a function not only of the character-

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[1] As was noted in the previous chapter, this unreliability arises from the combination of a small sample size and a relatively large pool of predictors from which the few best are chosen. In such a situation it has been suggested that as many as 500 subjects per variable are required to produce reliable results (cf. Kerlinger & Pedhazur, 1973, p. 283).

istics of the factions involved but also, and possibly more importantly, of

the characteristics of the influential individual (or individuals) in the

group.

On applying this framework to the results of the data analyses, those

results appear to be quite reasonable. The interpretation of the results for

the third and fourth hypotheses are relatively unaffected, since the shift

from an emphasis on the influential subgroup to an emphasis on a member of

that subgroup does not alter either the measurement of total change in group

opinions (H. IV) or the identification of which subgroup exhibited the first

movement (H.III). On the other hand, the results for Hypothesis I now become

understandable. It can be argued that for an individual to be influential, he

or she must not only be perceived as confident and knowledgeable but must also

be seen as being much more so than the rest of his or her group - i.e., he

or she must stand out. Therefore we would expect that the subgroup of

which this person is a member would have relatively high variances on the

person perception items, as is, in fact, the case. Note that while it could

also be said that the influential subgroups might also have gained such high

variances as a result of having one member who deviated in the opposite di-

rection, this does not appear to have been the case here. In at least one

instance, the best two predictors of influence were high heterogeneity on the

confidence measure and a high average confidence score, a result which would

only be obtained when the subgroup members were perceived as being maximally

different from one another while also having positive scores on the variable.

A similar line of reasoning can be applied to explain the lack of sup-

port for the frequency of communication hypothesis. If we postulate that

the most vocal individual will be most influential and that this will hold

true regardless of either the size of his subgroup or talkativeness of his

fellow subgroup members, then it becomes clear that the correlation between the frequency of communication by factions and their influence on others could be quite low.

There is one last issue to be considered. Upon applying this argument to the results which suggested it, another complication arises. While the idea of the influential individual apparently holds for influence in terms of the group decision, it does not appear to apply to influence with respect to the private opinions of group members. For this latter measure, it seems that it is actually the subgroup which is influential, since the most impor- tant predictors are, in this case, group related (e.g.,SIZE, COMP). In other words, it seems that individuals may be most salient in the consideration of influence on a group decision while factions may be more important with res- pect to influence on the personal opinions of the other members. Upon reflec- tion, it does not seem intuitively unreasonable that this may be the case in group discussions such as this. For example, it may be simply that the need to reach a consensus forces the group members to accomodate their expressed opinions to the position of the most dominant or committed member. However, in order for modifications to also occur in the personal beliefs of members, there must be a subgroup or faction whose numbers and apparent confidence render their position believable.

While these lines of reasoning are entirely post hoc and as such can be considered speculative, they do raise some important issues for future re- search concerned with social influence. We will return to a consideration of those issues at the conclusion of this chapter.

Methodological Considerations

Having attempted to interpret the results of the study, it now remains to examine the reasons why these interpretations should be viewed with

caution. There are a variety of reasons why the results may not be reliable, and most of these can be deduced directly from the nature of the group compositions presented in Table 1 of the second chapter. As originally conceived, the study would have involved a rather larger number of groups, all having identical compositions (2 persons in the 8% - 12% range; 4 persons in the 35% - 40% range). However, the Opinion Survey item which was used as a pretest proved to be an inaccurate predictor of the opinions which subjects would express in the experimental situation. As a result, the opinion compositions of the groups ultimately used in the study were far less comparable than had been expected. It is likely that it was this lack of sharply delineated subgroups which led to the previously mentioned problem of group members not partitioning their groups along the lines of opinion difference. In itself, this between group variance would not have been as serious if a much larger sample size had been employed. Unfortunately, however, this was not possible, since the groups which were used exhausted the pool of those available volunteer subjects whose pretest responses made them suitable candidates for this study.

The ways in which this combination of heterogeneous groups and small sample size tend to vitiate the results of the study are quite clear. The first involves the relationship between the number of variables in a correlational study and the sample size, a problem which has already been described in the previous chapter. In a purely correlational study, the smaller the sample size on which a significant R^2 is based, the less is the confidence which can be ascribed to that result because of the compounding of error involved in the calculations. This argument clearly weakens many of the reported results.

The second consequence of the combination of a small sample size and a

large between group variance (error variance) is that a statistical test will have relatively low power to detect population differences or relationships. In other words, it is unlikely that the statistical procedure employed will detect a significant relationship in the data even though such a relationship may exist in the population. The implication of this is that a failure to find results supporting an hypothesis cannot be interpreted to mean that the hypothesis is untenable, simply because one cannot determine whether the failure is due to the qualities of the population or to the lack of precision in the study. While this problem arises in any study which fails to reject a null hypothesis, it is exaggerated in those with small sample sizes. While the probability of erroneously rejecting a true null hypothesis (α) is set a priori and is unaffected by sample size, the probability of erroneously failing to reject a false null hypothesis is not. As sample size decreases, the probability of this latter error increases, often to the point where an erroneous failure to reject the null hypothesis is more probable then a correct decision. For this reason, the lack of support for three of the five hypotheses in this study is particularly ambiguous.

But what of the results which provide support for the remaining hypotheses? As we noted above, the probability of a false rejection of the null hypothesis does not vary with sample size or error variance and so we should be able to conclude that we have (1 - α) % confidence in these results. There is, however, one further complication. Because the groups did not contain the clear polarization of opinions which had been expected, it was often not clear which subgroups shifted from their initial positions. In view of this, the nature of a problem with the results of Hypothesis III comes into focus. Because the groups had little initial variance in their opinions, the influence measures necessarily had restricted variability. Thus a dichotomous measure of

conversion (reflecting which of the two subgroups contained the member who first exhibited an opinion shift) may have captured a large part of what little variance existed in the criterion simply because it was logically related to that criterion. Both were measures of the shift in that opposing group's opinions, and as such it is certainly not surprising that they had a high correlation.

Conclusions

From the above, it appears that the results, and therefore the interpretations, of this research are subject to more than the usual number of qualifications and caveats. Nevertheless, it may be claimed that this research does raise some important issues for further research.

The first such issue concerns the use of confederates in research on social influence. It seems that the predictions derived from research relying on confederates were not particularly applicable to these data. While it may be argued that this study employed too few groups for the results to be highly reliable, the fact remains that the predicted relationships were not found. This would tend to imply that the processes underlying those predictions are relatively weak (or nonexistent) in the present situation. For example, it may be that the predicted relationship between the size of a group and both its perceived confidence and competence does indeed obtain with respect to the intransigent behavior of confederate minorities but that in natural groups the size factor is less salient. In view of this, it seems important to investigate the possible relationship between the use of confederates and the processes of social influence, possibly using a design similar to this but with confederates forming either the majority or the minority in some of the groups while naive subjects would form both factions in other groups. This would permit a direct comparison between the form of

influence which occurs in response to confederate pressures and that which

occurs in more natural group settings.

The second issue concerns the stability of the opinions which researchers

use as the targets of influence. In this study, the attitudes measured were

apparently unstable over situations, and this instability has a number of un-

fortunate consequences. First, the construction of natural groups on the

basis of unstable attitudes does not produce the expected group compositions.

While on the basis of their Opinion Survey responses these groups had quite

distinct factions, those splits were not reflected in the opinion composi-

tions in Table 1. Secondly, in such a situation it is difficult, if not im-

possible, to determine whether a measured change in an unstable attitude in-

dicates a genuine response to influence attempts or simply a more-or-less

random error component. Thirdly, even if the measured change did reflect

a true change, it can be argued that an unstable attitude is relatively easily

influenced and that a more firmly anchored belief might not be affected by

the same factors or in the same fashion. If studies of social influence are

to have non-trivial generalizability, it would seem imperative that they avoid

these problems by using as dependent variables only those opinions or atti-

tudes to which the subjects feel some initial commitment.

The third issue concerns the influence of the individual in a group. In

the literature reviewed in the Introduction, there are discussions of the char-

acteristics of influential individuals (e.g., confidence or volubility) and

of the characteristics of influential subgroups (e.g., sheer numbers) but

there is little discussion of whether an individual or a faction will be the

most powerful agent of influence in a given group. The implicit assumption

appears to be that the individual will only be salient as an agent of influ-

ence when there are no actual subgroups or factions of opinion, but this

assumption is not necessarily justified. The results reported here would

seem to indicate that in some instances (or in terms of some measures) an

individual may be responsible for influencing the other group members while

in other cases it will be the subgroup as a unit which is influential. In

view of this, the researcher who investigates majority or minority influence

would be well advised to include a consideration of the role of the indi-

vidual in these subgroups. For example, consider a study which finds that a

majority wins over a minority in 80% of the groups observed, a result which

apparently indicates that majorities are more powerful than minorities. It

may be, however, that if one were to investigate which individual group mem-

bers were seen as most influential, one would find that in all cases the most

influential individual was a member of the most influential subgroup. This

finding would then lead to an alternative conclusion, namely that it is the

presence of an influential individual which gives a subgroup its power. Whe-

ther or not such a result would occur is an empirical problem, but in view

of the results of this study the possibility should be investigated.

In summary, then, this research has yielded four tentative results, two

rather more definite conclusions, and at least three unresolved questions

concerning the process of social influence in unmanipulated small groups.

To reiterate, it was tentatively suggested that: a) increased subgroup sol-

idarity is not accompanied by increased influence; b) the confidence and

competence which are attributed to a subgroup are not functions of its size;

c) frequency of communication by a subgroup does not determine its influence;

and d) there may be cases in which the influence of a subgroup is determined

by the characteristics of an influential individual member rather than by

the characteristics of the subgroup as a unit. Also, we concluded more con-

fidently that: a) compromise is not the mode of solution by which groups

resolve their differences of opinion; and b) winning of the first convert (or at least not being the first to show movement in opinion) may be a factor in determining a subgroup's influence. Finally, the unresolved issues which were raised concerning future research into social influence were: a) the role of confederates; b) the effects of instability in the target belief, and c) the role of the individual group member.

As a closing observation, it should be noted that although this particular study developed some serious flaws as a result of sampling difficulties, the method may yet prove valuable for the study of social influence. By selecting an issue for which opinions are more stable and choosing a more accurate method of pre-screening subjects, one might assemble groups of naive subjects with distinct majority-minority splits and thus demonstrate more conclusively the extent to which the results of previous research with confederates can be applied to more natural situations. While there is certainly a need for research based on the controlled manipulation of experimental conditions which is possible using confederates, there is also a need for research involving more realistic conditions. While this second sort of research may not be well suited to investigating the sorts of "cause and effect" problems with which the former may deal, it can be useful in establishing limits to the generalization of the results of the former method. It is in this sense that studies such as the one reported here are likely to prove most valuable.

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Appendix A

Materials

NAME_____   SEX_____

                                            YEAR & MAJOR_____

TEL. NO._____

        Please check your timetable and indicate with an "X" all the times when
you might be available to participate in our research.

<table>
<tr><td colspan="8">Daytime</td><td rowspan="2"></td><td></td></tr>
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        Saturday Afternoon [ ]   Sunday Afternoon [ ]

---

1) Mr. and Mrs. Smith have been married for fourteen years and are now getting
a divorce. Mrs. Smith will have custody of their two children aged four and
eight. Mrs. Smith is 39 years old and has never worked. The Smiths live in
a small town where daycare facilities are somewhat limited. Mr. Smith is an
executive in a successful advertising firm. Mr. Smith clears $1500.00 per
month (after taxes). Mrs. Smith sued Mr. Smith for the divorce on the grounds
of his committing adultery. Assuming there is no alimony, how much should
Mr. Smith pay Mrs. Smith for child support per month?

100-250   250-400   400-550   550-700   700-850   850-1000   (circle one)

2) A labour dispute is currently in arbitration. The management states that
they cannot give more than the federal guideline of 8%. The union has demanded
a 40% increase in order to bring them up to the level paid for similar jobs
in other industries. If you were appointed arbitrator, with power to impose
a settlement for a one year contract, what percentage increase would you allow
the union. Assume that a cost-of-living allowance clause will be included on
top of the percentage increase.

                                                              _____%

3) Mr. and Mrs. Monroe are suing a Dr. Sanders on behalf of their fourteen
year old daughter, Susan. Susan was a promising young swimmer and diver who
had already won a number of competitions and was slated to compete interna-
tionally. However, she contracted an ear infection which, due to an error in
judgment, Dr. Sanders neglected to treat and which resulted in a damaged ear-
drum which is now extremely sensitive to pressure changes. As a result, Susan
can no longer dive and even her ability to enjoy recreational swimming is
greatly impaired. The damage did not result in any hearing loss or other prob-
lem. The Court has already determined that Dr. Sanders is indeed responsible
for the condition and there only remains the determination of the amount of
money that should be given to Susan as compensation for the pain and suffering
(past, present and future) that results from this condition. The suit asks
for $200,000 compensation. What would you consider to be a fair award?

0 - $20,000	_____	$100,001 - $120,000	_____
$20,001 - $40,000	_____	$120,001 - $140,000	_____
$40,001 - $60,000	_____	$140,001 - $160,000	_____
$60,001 - $80,000	_____	$160,001 - $180,000	_____
$80,001 - $100,000	_____	$180,001 - $200,000	_____

4) Mr. and Mrs. Gallagher have been married for 7 years and Mrs. Gallahger is
now filing suit for divorce on the grounds of adultery on the part of her hus-
band. Mr. Gallagher is a senior engineer for a large firm and clears (after
taxes) $1,800. per month. Mrs. Gallagher is a secretary/receptionist in a
small law firm and clears (after taxes) $800. per month. The Gallaghers have
no children. How much do you think Mr. Gallagher should pay to Mrs. Gallagher
in alimony?

$_____

A labour dispute between a major university (not U.B.C.)and its food services staff has been submitted for binding arbitration. The previous two year contract, which expired four months ago, had provided wage increases which barely met the rate of inflation and thus the food services staff made no real gains during the past two years. Therefore, their union has asked for a 40% increase over one year, a sum which will bring the workers up to the level of pay enjoyed by those doing similar work at other places.

The university opposes such an increase for a number of reasons. Recent increases in costs and sharply reduced government funding have seriously cur-tailed the university's educational programs, and forced many cutbacks and economy measures. Thus this is a particularly bad time for it to meet a large increase in its payroll. Also, although universities are not necessarily sub-ject to wage and price controls, it is felt that any increase over 8% at this time will adversely affect public confidence in economic restraints because the university is almost entirely supported by government dollars.

If you were appointed arbitrator of this dispute, with complete authority to impose a settlement which would be honored by both sides for one year, what percentage increase would you allow the union? Assume that a cost of living allowance will be included on top of the percentage increase.

(Circle one)

8%   12%   16%   20%   24%   28%   32%   36%   40%

Seat No. _____

Discussion Information Form

1. What settlement did the group finally agree to? _____%

2. What settlement do you personally feel the union should receive? _____%

3. To the best of your recollection, what was each person's opinion at the beginning of the discussion?

   Person 1_____%; 2_____%; 3_____%; 4_____%; 5_____%; 6_____%

4. If you changed your opinion, what reason did you have for changing? (Check one)

   Arguments of others were persuasive. _____

   Upon reconsideration, another percentage seemed more appropriate. _____

   So that the group could reach an agreement. _____

   Other (State briefly) _____

   _____

5. What was the initial opinion range among the discussion participants? (Check one).

   Everyone was in virtual agreement. _____

   There were basically two distinct positions. _____

   There were basically three distinct positions. _____

   There were more than three distinct positions. _____

   Everyone was in virtual disagreement. _____

6. Who was:

   a) the first person to change from their original position? Seat No. _____

      Which way did they change? _____ Higher _____ Lower

   b) the second person to change? Seat No. _____

      Which way did they change? _____ Higher _____ Lower

   c) the third person to change? Seat No. _____

      Which way did they change? _____ Higher _____ Lower

7. Each of the following scales represents a dimension of some personal characteristic. For each scale, consider each person in the group (including yourself) in turn and decide what point on the scale best describes that person. Then write down the number corresponding to that point in the appropriate space below the scale.

Example: If one of the scales was aggressive-passive and you felt that Persons 2,3, and 5 were slightly aggressive, Person 6 very aggressive and Persons 1 and 4 moderately passive, then you would complete that scale as follows:

```
            very moderately slightly neutral slightly moderately very
aggressive———'————————'—————————'———————'———————'——————————'——————————'——passive
            +3        +2        +1       0       -1        -2        -3
```

Person 1 -2 ; 2 +1 ; 3 +1 ; 4 -2 ; 5 +1 ; 6 +3

```
a)          very moderately slightly neutral slightly moderately very
reasonable ——'————————'—————————'———————'———————'——————————'—————————' unreasonable
            +3        +2        +1       0       -1        -2        -3
```

Person 1 ____ ; 2 ____ ; 3 ____ ; 4 ____ ; 5 ____ ; 6 ____

```
b)          very moderately slightly neutral slightly moderately very
confident ———'————————'—————————'———————'———————'——————————'—————————'—unconfident
            +3        +2        +1       0       -1        -2        -3
```

Person 1 ____ ; 2 ____ ; 3 ____ ; 4 ____ ; 5 ____ ; 6 ____

```
c)          very moderately slightly neutral slightly moderately very
consistent——'————————'—————————'———————'———————'——————————'—————————'—inconsistent
            +3        +2        +1       0       -1        -2        -3
```

Person 1 ____ ; 2 ____ ; 3 ____ ; 4 ____ ; 5 ____ ; 6 ____

```
d)          very moderately slightly neutral slightly moderately very
resistant to '————————'—————————'———————'———————'——————————'—————————' willing to
compromise  +3        +2        +1       0       -1        -2        -3 compromise
```

Person 1 ____ ; 2 ____ ; 3 ____ ; 4 ____ ; 5 ____ ; 6 ____

```
e)          very moderately slightly neutral slightly moderately very
intelligent—'————————'—————————'———————'———————'——————————'—————————'—unintelligent
            +3        +2        +1       0       -1        -2        -3
```

Person 1 ____ ; 2 ____ ; 3 ____ ; 4 ____ ; 5 ____ ; 6 ____

```
f)          very moderately slightly neutral slightly moderately very
likable ————'————————'—————————'———————'———————'——————————'—————————'—— unlikable
            +3        +2        +1       0       -1        -2        -3
```

Person 1 ____ ; 2 ____ ; 3 ____ ; 4 ____ ; 5 ____ ; 6 ____

g)
a leader ⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯ a follower
very moderately slightly neutral slightly moderately very
+3   +2   +1   0   -1   -2   -3

Person 1 ____; 2 ____; 3 ____; 4 ____; 5 ____; 6 ____

h)
rigid ⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯flexible
very moderately slightly neutral slightly moderately very
+3   +2   +1   0   -1   -2   -3

Person 1 ____; 2 ____; 3 ____; 4 ____; 5 ____; 6 ____

i)
well ⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯uninformed
informed
very moderately slightly neutral slightly moderately very
+3   +2   +1   0   -1   -2   -3

Person 1 ____; 2 ____; 3 ____; 4 ____; 5 ____; 6 ____

j) gets
along well ⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯along poorly
with others
very moderately slightly neutral slightly moderately very   gets
+3   +2   +1   0   -1   -2   -3 with others

k)
I like ⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯ I dislike
very moderately slightly neutral slightly moderately very
+3   +2   +1   0   -1   -2   -3

Person 1 ____; 2 ____; 3 ____; 4 ____; 5 ____; 6 ____

8. In the spaces below each person's number, write in the seat numbers of those people with whom he or she best fits.

Person 1   Person 2   Person 3   Person 4   Person 5   Person 6
_____   _____   _____   _____   _____   _____

_____   _____   _____   _____   _____   _____

For each of the following four statements, circle the opinion which best expresses your own feelings:

9. The right to strike has been greatly abused by union leaders in recent years.

Strongly   Somewhat   Somewhat   Strongly
Disagree Disagree Disagree Neutral Agree   Agree   Agree

10. The real cause of inflation is the huge profits being made by the large industries.

Strongly   Somewhat   Somewhat   Strongly
Disagree Disagree Disagree Neutral Agree   Agree   Agree

11. Most workers are still getting less than they deserve in relation to the size of corporate profits.

Strongly   Somewhat   Somewhat   Strongly
Disagree   Disagree   Disagree   Neutral   Agree   Agree   Agree

12.   The solution to inflation will be found when everyone learns to moderate their demands for material luxuries.

Strongly   Somewhat   Somewhat   Strongly
Disagree   Disagree   Disagree   Neutral   Agree   Agree   Agree

13. Consider the following situation·

    Negotiations are in progress between a city school board and the custodial workers employed by the board. The previous contract, which gave the workers a large increase in salary, will expire this month and the union is demanding a 38% increase plus a cost of living allowance. Although the school board can afford to meet these demands, it feels that they are unjustified and that the money could be better spent on upgrading the schools. They therefore have offered only a 10% increase plus cost of living allowance. What do you feel the union should recieve?

                                                      _____%

Group	5 min.	10 min.	15 min.	20 min.	25 min.
Person 1 Initial ___ Final ___ Change ___					
Person 2 Initial ___ Final ___ Change ___					
Person 3 Initial ___ Final ___ Change ___					
Person 4 Initial ___ Final ___ Change ___					
Person 5 Initial ___ Final ___ Change ___					
Person 6 Initial ___ Final ___ Change ___					

Time to
Consensus ___
Consensus
Position ___

Appendix B

Computational Details

Computational Formulae

In the following Formulae, the subtroup for which the index is being constructed is called the "ingroup" and the other subgroup the "outgroup." The symbols N_i and N_o refer to the numbers of subjects in the ingroup and outgroup respectively.

Groupness (GRP)

This variable represented a measure of the outgroup's perceptions of the variability among the ingroup members on the eleven person perception scales of Question 7 of the posttest. It was computed as follows:

1. For each member of the outgroup, the scores which she assigned to each member of the ingroup were mean deviated with respect to each item.

2. The deviation scores for a scale were then squared, summed, divided by N_i and the resultant number was raised to the 1/3 power.

3. The variance $^{1/3}$ scores for a given scale were then summed over the numbers of the outgroup and divided by N_o,

4. Finally the set of eleven average variance$^{1/3}$ scores were added to give the GRP score for the ingroup.

Example: Say there are two persons (A and B) in the outgroup and four (C, D, E, and F) in the ingroup. The scores of the four ingroup members on one of the scales are as follows:

	C	D	E	F
according to A:	+2	+1	0	+1
according to B:	+3	+1	+1	+2

1. The deviation scores are then.

	C	D	E	F
A:	+1	0	-1	0
B:	+1.25	-.75	-.75	-.25

2. The sums of the squared deviation scores divided by N_i and raised to the 1/3 power are:

A: $(1 + 1) / 4^{1/3} = (0.5)^{1/3} = \underline{0.794}$

B: $(1.25^2 + .75^2 + .75^2 + .25^2) / 4^{1/3} = (0.6875)^{1/3} = \underline{.883}$

3. The average score for the item is then simply

$$(.794 + .883) / 2 = \underline{.839}$$

4. Finally, the other ten values calculated similarly would be added to this one to yield the final GRP score for the ingroup.

Confidence (CONF)

The average confidence score for the ingroup was found by taking the average score which each member of the outgroup assigned to the members of the ingroup on the confidence scale (Q. 7B) and then finding the average of these for the outgroup as a whole. This variable was calculated as

$$\sum_{j=1}^{N_o} \sum_{i=1}^{N_i} (\text{Q. 7b scores}) / (N_i N_o)$$

If the figures used in the example above referred to the confidence scale, then the CONF score would be

$$(2 + 1 + 0 + 1) + (3 + 1 + 1 + 2) / (2 \times 4) = \underline{1.250}$$

Competence (COMP)

The average competence score was computed in the same fashion as the confidence score above, using the responses to Question 7i.

Computations of all the other indices are described in sufficient detail within the text.

<u>Correlation Matrices</u>

The single matrix presented on the following pages contains the cor-
relations between variables obtained under both partitionings of the dis-
cussion groups.   The entries above the diagonal are the correlations associ-
ated with the sociometric partitioning while those below the diagonal were
obtained under the <u>a priori</u> partitioning.

The variables labelled <u>A</u> to <u>K</u> are the measures of the variance between
subgroup members on the scales <u>a</u> to <u>k</u> of Question 7 on the Discussion In-
formation Form.   The procedures by which these and the other variables were
calculated are described in detail either in the text or in the preceding
section of this Appendix.

Variable	A	B	C	D	E	F	G
A	1.000	.242	.289	.384	.120	.568	.194
B	.511	1.000	.536	.474	.569	.398	.564
C	.489	.563	1.000	.647	.440	.471	.464
D	.538	.589	.696	1.000	.416	.561	.504
E	.469	.679	.551	.401	1.000	.507	.571
F	.661	.521	.553	.563	.696	1.000	.354
G	.615	.819	.609	.642	.622	.559	1.000
H	.596	.708	.585	.768	.607	.612	.740
I	.485	.766	.617	.556	.726	.639	.810
J	.609	.621	.424	.710	.528	.795	.598
K	.583	.447	.408	.637	.418	.750	.662
GRP	.727	.819	.741	.813	.745	.817	.875
SIZE	.254	.457	.188	.472	.398	.270	.583
INFL1	.289	.595	.195	.325	.371	.282	.233
INFL2	.036	.193	.018	.031	.166	.100	.187
CONF	-.154	.061	.118	.145	.126	.108	.226
COMP	.025	-.142	-.237	.106	-.248	-.071	-.036
CVRT1	.055	-.124	-.121	-.197	-.042	-.017	-.143
CVRT2	.100	.306	.021	.259	.085	-.059	.269
TALK1	.478	.294	.426	.437	.410	.313	.401
TALK2	.454	.065	.334	.220	.196	.249	.059

Variable	H	I	J	K	GRP	SIZE	INFL1
A	.503	.138	.694	.461	.578	-.047	.059
B	.602	.541	.387	.298	.705	.507	.572
C	.700	.461	.260	.220	.727	.423	.224
D	.835	.398	.514	.451	.814	.424	.453
E	.402	.673	.371	.405	.656	.410	.381
F	.566	.468	.777	.712	.783	.070	.212
G	.568	.606	.277	.465	.703	.641	.560
H	1.000	.419	.541	.565	.875	.486	.457
I	.633	1.000	.290	.335	.662	.372	.585
J	.615	.654	1.000	.730	.710	.008	.231
K	.612	.553	.809	1.000	.684	.170	.399
GRP	.857	.839	.822	.774	1.000	.457	.506
SIZE	.467	.459	.394	.363	.493	1.000	.417
INFL1	.286	.267	.455	.079	.361	.266	1.000
INFL2	.106	.103	.118	.221	.141	-.092	-.014
CONF	.306	.137	-.008	.181	.150	.136	.027
COMP	-.084	-.215	.005	.106	-.084	.077	-.035
CVRT1	-.141	-.209	-.178	-.016	-.136	-.571	-.179
CVRT2	.165	.027	.048	.015	.015	.143	.428
TALK1	.338	.352	.385	.296	.466	.506	.252
TALK2	.130	.085	.232	.151	.241	-.151	.046

Variable	INFL2	CONF	COMP	CVRT1	CVRT2	TALK1	TALK2
A	.280	-.138	.119	-.008	.***	.335	.408
B	.350	-.244	-.287	-.314	.***	.052	-.220
C	.007	-.148	-.319	-.314	.***	.304	.130
D	.027	-.111	-.148	-.223	.***	.199	.031
E	.139	-.218	-.178	-.399	.***	-.016	-.144
F	.159	-.064	.134	-.117	.***	.135	.215
G	.327	-.090	-.127	-.235	.***	.157	-.106
H	.134	-.031	-.225	-.181	.***	.277	.079
I	.354	.029	-.147	-.250	.***	-.016	-.152
J	.240	-.134	.196	.242	.***	.142	.207
K	.170	.206	.229	-.164	.***	.234	.269
GRP	.262	-.105	-.116	-.292	.***	.244	.091
SIZE	.312	-.029	-.154	-.378	.***	.363	-.142
INFL1	.654	.144	-.305	-.066	.***	-.119	-.288
INFL2	1.000	-.002	-.318	.218	.***	.232	.049
CONF	-.164	1.000	.406	.008	.***	.209	.291
COMP	-.024	.257	1.000	-.257	.***	-.015	.129
CVRT1	.689	-.115	.302	1.000	.***	-.144	.020
CVRT2	.558	.164	.490	.429	1.000	.***	.***
TALK1	.102	-.170	.076	-.105	.211	1.000	.846
TALK2	.083	-.194	.200	.300	.147	.712	1.000