

DIFFUSION OF RESPONSIBILITY AND LEVEL OF
RISK TAKING IN GROUPS

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Abstract

This study reports evidence supporting the following propositions:

(1) Group discussion and consensus concerning decisions that involve actual risk and payoffs lead to greater risk taking than occurs in the absence of such discussion and consensus. (2) The mechanism that underlies this group-induced shift toward greater risk taking consists of a diffusion or spreading of responsibility. Using risks and payoffs based on monetary gain and loss for problem-solving performance, the above propositions received strong confirmation for male college subjects. The results of various experimental manipulations provided positive support for viewing diffusion of responsibility as the causal factor at work.

DIFFUSION OF RESPONSIBILITY AND LEVEL OF RISK TAKING IN GROUPS¹

In a recent study of individual and group decision-making, Wallach, Kogan, and Bem (1962) found that a group consensus achieved through social interaction tended to be more risky than the average decision of the individual members of those groups. In each of a number of hypothetical life situations, a protagonist faced the choice between a more risky and a less risky alternative. The individual or the group was asked to decide on the lowest probability level for the success of the more risky alternative that would suffice to warrant its choice. The generation of a greater risk taking orientation was all the more intriguing because of the social forces that might have been expected to yield an averaging effect or a move toward greater conservatism as the product of group interaction. Averaging might be expected through a process of minimizing the maximum individual concession; greater conservatism, through a fear of appearing foolhardy to others. That greater risk taking occurred instead, however, suggested that individuals, when constituted as a group, experience a diffusion of responsibility as a product of the knowledge that one is deciding upon an action jointly with others rather than deciding by oneself.

The present experiment was designed to cast further light on issues raised by our previous work. Consider first the hypothetical nature of the risks involved in the previous study's decision situations. Since the life dilemmas dealt with by the individual or the group were hypothetical, one must ask whether similar or different results would be obtained in decision situations involving actual rather than hypothetical risks and payoffs. Despite the realistic and highly involving character of the hypothetical decision problems, the introduction of actual payoffs in the decision

situation injects a new element. Whether this element will place limits on the generalizability of our earlier findings is, of course, a matter for empirical test.

The kind of group decision-making studied in the present investigation has two distinctive components. First, group members are striving toward a group product--a decision between alternative courses of action based on an evaluation of their desirability and probability of attainment. This was the component involved in our previous study. A further component, however, may come into play when actual in contrast to hypothetical payoffs are introduced. Namely, the consequences of the decision may impinge upon the members of the group as a whole, thereby engendering in each group member a feeling of responsibility for the others who are perceived as linked with him in a common cause. For this second component to be active, it may be necessary for the group members to be of equal status, or at the very least, for no member to be entitled to special privileges that would permit disproportionate enjoyment of or escape from the consequences of the group decision. We shall refer to the two components described above as group decision and group responsibility, respectively.

In our previous study, only the first element could be systematically explored, for the obvious reason that decisions rendered under hypothetical conditions do not have real outcomes. Under these circumstances, the issue of mutual responsibility among group members is a peripheral one. The development of strong feelings of mutual responsibility would seem to depend on the group standing to gain or lose something as a consequence of its decisions.

With these considerations in mind, the present experiment was designed to permit a critical test of the extent to which the components of group decision and group responsibility contribute to level of risk taking in

group decision-making. We have already demonstrated that group decision enhances risk taking propensities in a hypothetical decision context. The introduction of actual payoffs into the decision context, however, raises three further questions to which the present experiment will address itself.

(1) Does group decision continue to exert its risk taking effects under these new decision conditions?

(2) What are the effects of group responsibility upon level of risk in group decision-making?

(3) What is the nature of the interaction between group decision and group responsibility with regard to their joint effect on level of risk in group decision-making?

Let us spell out the implications of the above questions in somewhat greater detail. With regard to the first question, it might seem reasonable to propose that the diffusion of responsibility presumed to characterize subjects' decisions in our previous experiment should also exert its effect in the present experimental context. Yet, the possibility must be considered that the previously observed effect might be attributed merely to the absence of payoffs under the hypothetical decision conditions that prevailed in our earlier work. The present experiment will attempt to resolve this point.

Consider next the second question--the mutual responsibility that may be experienced among group members. Contrast the case in which the individual's decisions affect only himself with the case where his decisions affect other members of his group. It would be very surprising indeed if the latter condition failed to produce a greater level of conservatism in decision-making.

The two questions examined thus far are intended to provide a basis for a discussion of Question 3. The major purpose of the present study is an assessment of group relative to individual risk taking levels as a joint function of group decision and group responsibility. We shall, in other words, consider the consequences for risk taking of the presence of both of the above independent variables, as well as the presence of one in the absence of the other. The absence of both implies individual decision-making, a control condition in the present investigation.

What can we expect to occur when group responsibility of the sort described above--a force toward conservatism--is paired with group decision--a force toward risk taking? There are several possibilities. The two independent variables might cancel each other, with the consequence that decisions are neither more risky nor more conservative than comparable individual decisions; one or the other variable might prove to be dominant; or the operation of one actually might change the character of the other in the sense that one enlists the other in its service. Under this last possibility, the level of conservatism or risk when both variables are operating would be greater than that found for either alone. Thus, if group responsibility enlisted group decision in its service, then group decision with group responsibility present would lead to greater conservatism than was found with group responsibility per se, even though group decision per se would lead to increased risk taking. If, on the other hand, group decision enlisted group responsibility in its service, then the presence of both would lead to greater risk taking than occurred in the case of group decision per se, even though group responsibility by itself would cause increased conservatism.

The present experiment has been designed to provide a definitive basis for choosing among the various alternatives spelled out above.

Method

Procedure for Problem Sets 1-5

Prospective subjects were told that the experiment concerned decision-making and problem solving and that they could earn up to \$15 by participating. They were informed that the session would run no longer than one hour, and were guaranteed that they would not earn less than \$1.25.

In all conditions of the experiment, three college students met the experimenter at a prearranged time and spread out around a conference table in a seminar room with a blackboard. They were without previous acquaintance and of the same sex. Each was given to understand that he would work individually. He then was told:

"This is psychological research in the general area of decision-making and problem solving. The experiment itself is quite straight forward in the sense that you will be able to see the kinds of things we are interested in as you go through it; there isn't anything particularly hidden or mysterious about it. You will probably be most interested in the problem-solving aspect of the experiment since it is upon this that your salary depends. Your main task, which will take place in about the last 20 minutes of this hour, will be to answer 10 multiple choice questions which have been taken from old College Board examinations. Specifically, these have been taken from the morning aptitude tests, which means that no particular course knowledge is assumed other than a high school education. In other words, there will be no English Literature questions, calculus problems, etc. Your salary varies from a maximum of \$15 down to the minimum of \$1.25 because you will be paid for each question answered correctly, and you will not be paid for questions not answered correctly; it's that simple. If you should happen to earn less than \$1.25 in this way, then we

add to the amount you have won to bring your salary up to that amount. Your salary also varies because you are able to select how difficult a question you want to try: harder questions pay a higher prize. I can probably best illustrate the exact procedure we will follow by showing you the answer sheets."

At this point the experimenter gave each subject a booklet titled "Choices" and a pencil. The booklet consisted of 10 pages of the type shown in Figure 1. The experimenter then continued:

Insert Figure 1 about here

"There are 10 sheets, all like the top one, stapled together. Each sheet will correspond to one of the 10 questions you will be answering. If you will look over on the right hand side where it says, "Difficulty levels to choose from," you will see a column of percentages. This column has the following interpretation: Each percentage corresponds to a different question. The 30% question, for example, was failed by 30% of the people in the nation when that question appeared on the Board exams. In other words, the questions get harder as you go down the column until you reach one which 90% failed--or, only 10% were able to answer that question correctly. The amount you can win for answering each question correctly is shown in the extreme right hand column; as I mentioned, you will notice that the more difficult the question, the more you can win. You will have the opportunity, then, to select how difficult a question you want to try. Also, these percentages have been adjusted slightly to correct for the fact that it is high school seniors who take the exams; in other words, you may interpret these percentages to be college level percentages.

"Now we don't expect you to know offhand just how difficult a question at a particular level is without having seen one. For this reason, you will have the opportunity to work practice items to familiarize yourself with the types of questions and the various difficulty levels. If you will look in the main section of this top sheet you will see that you will be working practice questions at the 10%, 35%, 60%, and 85% levels.² These practice questions will count neither for nor against you, and I will give you the correct answers to them. In this way you will be able to judge about how difficult all the levels will be. We didn't think you would want to bother working a practice problem at each level, and so these four are pretty well spread across the range and should give you a good idea of the other levels of difficulty. You will notice that the practice questions are spaced on the page to correspond to the right hand column from which you will actually be selecting the money questions. To summarize, then: You will work four practice questions of a particular type; I will give you the correct answers; and then you will select how difficult a question--of that type--you want to try answering for money. We will do this for each different type of question.

"Now, although we do not care whether you get the practice questions correct or not, we are interested in knowing just how confident you are in your answers: how sure are you that your answer is correct. That is what the 'Confidence' column is for; each time you answer a practice question we would like you to go immediately to this column and circle one of the code letters. The code is given up here on the board; it is not particularly profound; we just didn't have room for all that on the sheets."

The following had been present on the blackboard from the beginning of the session:

VS = very sure

QS = quite sure

MS = moderately sure

SS = slightly sure

NS = not sure at all

"You should mark confidence levels as you go so they will be accurate, rather than waiting until you finish all the practice items and going back. Now will you, at the very top of this first sheet, write your name, your age, and your college major. If you don't have a major yet, we would still like to know if you think it will be science or non-science."

The experimenter then gave each subject a booklet titled "Practice Questions." It contained five types of questions: antonyms, mathematics, analogies, spatial relations, and sentence completions. The experimenter then continued:

"These booklets I have just handed you contain all the practice questions, none of the money questions. If you will look at the cover of the booklets, you will see that the first type of question we will be considering is 'antonyms.' Will you, therefore, write the word 'antonyms' on your first answer sheet where it says 'Type of Question.' Now read the example antonym question they have worked for you; they want the word most opposite in meaning to the given word. Now if you will turn the page, you will see four practice antonym questions; these correspond to the 10%, 35%, 60%, and 85% levels respectively--you will feel them getting harder as you go down the page. These should be answered in the answer column of your first sheet, then, in the appropriate spaces."

After all practice questions were answered and confidence levels indicated, the experimenter put the correct answers on the blackboard, reading

them out as he wrote them: (e.g., "The correct answers to these are b, b, c, d, in that order"). They remained on the board for the remainder of the session. Accurate and equalized feedback as to correct answers thus was provided for all subjects. Toward the same end, in this and in all other practice sets, the experimenter explained in detail the rationale or method of solution for all of the more difficult questions, and encouraged and answered questions about the items. Group discussion, in those conditions where the subjects later experienced it, therefore could not provide any more feedback concerning correct answers to these practice questions or the rationales for the correct answers, than was already possessed by the subjects in all conditions.

The experimenter then continued:

"Now that you see how difficult the problems are at the various levels and about how well you can do on them, we want you to select one difficulty level to try for money. You do this by circling one of the nine percentage levels in the right hand column. For example, after seeing these practice problems, if you think you would like to try for the 90% level question, you should circle that level. Then, later when you answer all the money questions, I will give you one antonym question which is slightly harder than -----versus-----, which was the 85% level. If you get the question right, you will win \$1.50 for it; if you miss it, you will get nothing. This same procedure applies to whatever level you select: the correct answer earns you the amount shown in the extreme right hand column; failing the question means you earn nothing. Remember that this does not obligate you to select the same level for any other question; this decision you are making right now applies only to the one antonym question, which will be drawn from the same files as the practice problems you just worked. The practice problems are intended

only to be a guide in your decision; you are free to select any level you care to. Okay, go ahead and circle a level you want to try for money; don't rush, we have plenty of time--this is your money you're deciding on."

The payoff schedule of amounts to be won for correct answers to questions with varying probabilities of success was so arranged that the expected values for all questions were equal and set at 15 cents.³ As indicated on Figure 1, the difficulty levels from which the subject made his choice varied in 10% steps from items failed by only 10% of a norm sample (with a prize of 17 cents for a correct answer) to items failed by 90% of that sample (with a prize of \$1.50 for a correct answer). The actual bet question itself was always deferred until the choices of difficulty levels for all ten sets of problems in the experiment were completed. This acted, of course, to eliminate the possible influence that winnings might exert on choice of subsequent difficulty levels. Here and in the subsequent problem sets, the experimenter indicated that he possessed a large pool of questions for each of the nine levels of difficulty, and that he later would draw from this pool an actual bet question at the difficulty level that each subject selected.

The experimenter then asked the subjects to turn to the next page of their "Choices" booklet, write in "mathematics" next to "Type of Question," and proceed as before. The procedure just described for antonyms was repeated in identical fashion with a set of four mathematics problems. Once again sample items with difficulty levels of 10%, 35%, 60%, and 85% were used. After the practice questions were answered and confidence levels indicated, the experimenter provided the correct answers and explained the rationale for the more difficult items. Then each subject decided on a difficulty level for the actual bet mathematics question that he would answer for money. The same range of difficulty levels from which to select, and associated winnings for

correct answers, were provided as have been described for antonyms. Once again the answering of the actual bet question was deferred until later.

The above procedure was repeated for three more sets of problems: analogies, spatial relations, and sentence completions. In each of the analogies questions, the pair of words that best expressed a relationship similar to that expressed by a given pair of words was selected from multiple choice alternatives. In each of the spatial relations problems, a perspective drawing of a set of blocks was presented in which some of the blocks necessary to the structure could not be seen. The respondent was to determine, from among multiple choice alternatives, the number of blocks in the structure. Each of the sentence completion problems, in turn, consisted of a sentence with one or two blanks in it. From multiple choice alternatives, the subject had to choose the word or set of words which, when inserted in the sentence, best fitted in with the sentence's overall meaning.

Procedure for Problem Sets 6-10

The difficulty levels chosen for the first five sets of questions, according to the procedure described in the preceding paragraphs, provided a baseline with which choice of difficulty levels on question sets 6 through 10 could be compared. Whereas all subjects chose difficulty levels in the manner described above for question sets 1 through 5, conditions of choice varied for question sets 6 through 10. These conditions all shared two attributes, however. First, practice questions were not given for sets 6 through 10, since these sets concerned the same types of questions that were encountered in sets 1 through 5. Second, the answering of the actual bet questions was deferred until difficulty levels for all 10 question sets had been chosen. Subjects were not permitted to change any of their decisions concerning sets 1 through 5 in the course of their decisions for sets 6 through 10.

Before embarking upon problem sets 6-10, subjects in all conditions were told:

"You will notice that you are at the end of the practice booklet. This is because the second five questions do not introduce any new type of question. So, it is no longer necessary to work practice questions. Questions 6 through 10 will follow in the same rotation as the first five; so will you write the word 'antonyms' on sheet 6. In other words, there will be two questions of each type and it is only necessary on these second five questions to decide on the difficulty levels you care to try.

"In deciding what levels to try for on these second five questions, you may refer back to the corresponding questions 1 through 5, to the decisions you made on those, to the correct answers which are still on the board, or to the question booklet. You need not select the same levels you picked before, however; you are free to select any levels you wish for the last five questions."

Personal responsibility--group decision. Specific instructions for this condition read as follows:

"We are now interested in having you work on problems at difficulty levels you have not chosen by yourself for questions 6 through 10. We want all three of you to try the same levels of difficulty for each of the last five questions; the exact levels to be tried will be up to the three of you. In other words, we want the three of you to discuss each type of question in turn and come to a unanimous agreement on the level to be tried by all of you. This should be unanimous, not just a majority decision.

"Okay, why don't the three of you decide what level is to be tried for question 6, the antonym question."

This procedure continued for the remaining question sets.

Group responsibility--individual decision. Specific instructions for this condition are as follows:

"As stated, you will all answer the first five questions at the levels you have selected, but we only require one person to answer each of the second five questions. If he answers the question correctly, all of you win the prize; you don't even have to split it--you all win the amount for that level. If, however, he misses the question, then none of you wins anything. The person responsible will be decided by chance by spinning this spinner. Each of you will find a code letter on the front of your answer sheets; you are K, L, and M. We will spin this spinner five times, once for each of the questions 6 through 10. In other words, on each question, you have one chance out of three of being responsible to the entire group for it."

The experimenter pointed to each subject in succession when designating their code letters. The spinner was divided into three equal segments labeled with the corresponding code letters. The experimenter then proceeded:

"You will try the question at the level you are now about to select. Okay, select a level you would like to try for the antonym question."

This procedure was continued for the remaining question sets. Each subject continued to select the difficulty level for each actual bet question in private. No discussion among the subjects occurred at all.

Group responsibility--group decision--chance designation of responsible group member. The first paragraph of instructions for the immediately preceding condition was also used here. The experimenter then continued:

"The level to be tried for the various questions is entirely up to the three of you. You are to discuss each of the questions 6 through 10 and come to a unanimous agreement on the level to be tried. This will all take place before you know who will be answering each question. Okay, why don't the

three of you decide what level is to be tried for question 6, the antonym question."

This procedure was continued for the remaining question sets.

In the two conditions where the spinner was used--group responsibility with group decision (chance designation) and group responsibility with individual decision--the subjects knew that the spinning would be deferred until after the difficulty levels for problem sets 6 through 10 had been chosen.

Group responsibility--group decision--group designation of responsible group member. Specific instructions for this condition duplicated the immediately preceding "chance designation" condition, except that the choice of who would be responsible for answering each actual bet question was determined not by a random device, but rather by an agreement among the three subjects. By this means, subjects could choose as their representative, for each type of problem, the person among them who seemed most skilled in handling it.

Control condition. This condition represented a continuation, for problem sets 6 through 10, of the procedure that prevailed during sets 1 through 5. The three subjects continued to work individually. Comparison of the difficulty levels chosen on sets 6 through 10 with those chosen on sets 1 through 5 indicated the magnitude of practice effects ensuing from a repetition of the initial task under identical conditions, and constituted a baseline against which the effects of the other conditions could be evaluated.

Answering of all actual bet questions was carried out in each condition after all difficulty levels had been decided upon. While these data are irrelevant to the purposes of the present experiment, we carried through this phase in order to fulfill our obligations to the subjects.

Mode of Analysis for Changes in Risk Taking

The basic index is the degree and direction of shift in risk taking on question sets 6 through 10 in comparison to sets 1 through 5. We may refer to this as the overall shift index. In the control condition and the group responsibility--individual decision condition, where no group interaction took place, the overall shift index was computed for each individual. It consisted of the mean of the individual's chosen difficulty levels for sets 6 to 10 minus the mean of his chosen difficulty levels for sets 1 to 5. In the three conditions involving group decision, the overall shift index was computed for each group. It consisted of the mean of the group's agreed upon difficulty levels for sets 6 to 10 minus the grand average, for the three group members, of the mean of their chosen difficulty levels for sets 1 to 5. The direction and magnitude of the overall shift indices obtained in one experimental condition then were compared with the direction and magnitude of the overall shift indices obtained in another condition.

In addition to the overall shift index, similar indices also were constructed for each type of item considered separately. For example, the item shift index for antonyms involved, in the control condition and the group responsibility--individual decision condition, each individual's chosen difficulty level for set 6 minus his chosen difficulty level for set 1; while, in the three group decision conditions, it involved each group's consensus difficulty level for set 6 minus the average, for the three group members, of their chosen difficulty levels for set 1. Analogously, the item shift index for mathematics questions involved difficulty levels for sets 7 and 2. Once again, the direction and magnitude of the shift index for a particular type of item obtained in one experimental condition were then compared with the direction and magnitude of the shift index for that same type of item obtained in another condition.

Shift indices for each type of item considered separately constitute a kind of "item analysis" for the various parts of the experimental task and are, of course, subordinate in importance to the overall shift index computed for the task as a whole.

Controls

The overall shift index and the shift index for each of the five types of items are difference or change scores. Since the shift in each experimental condition was measured relative to the subject's own performance under the individual decision conditions of sets 1 through 5, the subjects in each condition, hence, provide their own control.

In addition to the control obtained through using difference scores as just described, the equivalence of the subjects in the various conditions also was directly checked with respect to a number of potentially relevant characteristics. These were: degree of overall initial risk taking (the mean of the individual's chosen difficulty levels on question sets 1 through 5) as well as degree of initial risk taking on each type of item considered separately; level of ability in answering the various types of practice items provided for sets 1 through 5--both overall and for each type of item separately; degree of confidence with which the subjects answered the various types of practice items provided for sets 1 through 5--again, both overall and for each type of item separately; age of the subjects; and the proportion of subjects with majors implying vs. not implying a background in mathematics (the former group includes majors in the natural sciences, mathematics, and engineering).

Subjects

The participants were 336 male and female undergraduates enrolled in the summer session of the University of Colorado at Boulder. There were 168 subjects of each sex, and they were randomly assigned to the various

conditions. Within each sex, 45 subjects served in each of the conditions that involved three-person groups: namely, the two group responsibility--group decision conditions and the personal responsibility--group decision condition. There were, therefore, 15 groups in each of these conditions. Within each sex, 15 subjects served in the group responsibility--individual decision condition, and 18 subjects served in the control condition. The sample size within sex for each of the five conditions of the experiment thus was either 15 or 18, the N referring to groups in the conditions that involved group communication, and to individuals in the conditions that did not involve communication.

Results and Discussion

Results for Males

Controls. As noted above, control was built in through measuring each condition's degree of shift relative to performance by the same persons in an individual decision context. In addition, the five conditions of the experiment did not differ significantly from one another in the subjects' mean overall levels of risk taking for problem sets 1 through 5, nor in the variances for overall risk taking on sets 1 through 5. Analogous homogeneity across conditions prevailed with regard to means and variances for risk taking on sets 1 through 5 in the case of each type of item considered separately. The average risk taking level on sets 1 through 5 was 69.7%, with a range from 64.0% to 72.6% for the various types of items.

The subjects in the five experimental conditions were similar with regard to level of ability in answering the practice items that were provided for problem sets 1 through 5. The percentages of subjects in each condition failing each of the 20 practice items provided did not vary by more than chance margins. In addition, the distributions of confidence levels for answers to each of the 20 practice questions showed only chance variation across

conditions. Further, intransitivity in answers to practice questions at different difficulty levels was rare.

Finally, the distributions of ages for subjects in the various experimental conditions were homogeneous, as were the proportions of subjects in the various conditions with majors that imply a background in mathematics (all proportions were 33% or less).

Overall shift indices. The first column of Table 1 presents the basic findings of the experiment for the male subjects. Shown for each condition is

Insert Table 1 about here

the mean overall shift in chosen difficulty level, and hence in level of risk taking, for problem sets 6 through 10 in comparison with problem sets 1 through 5. The more detailed nature of this overall shift index was described earlier. The mean overall shift index for each condition is a percentage because it indicates the average shift, per individual and per type of problem, in preferred difficulty level as defined with reference to the percentage of a norm sample failing the problem. An increase in the percentage--i.e., a positive shift--hence indicates an increase in risk taking.

Consider first the results for the condition of personal responsibility--group decision. Note in the first column of Table 1 (row 2) that the average increase in risk taking for this condition is 5.6%, compared to the mean increase of 2.4% obtained for the control condition (row 1). In the first column of Table 2 (row 1) we note that a test of the difference between these two means

Insert Table 2 about here

yields a t value of 1.74, which is significant beyond the .05 level by a one-tailed test. This finding, then, suggests that group decision per se fosters risk taking in groups. Accordingly, the results of our previous experiment in which decisions of a hypothetical sort were obtained can now be generalized to a decision-making context involving actual risks and payoffs for the group members. Despite the fact that each group member will personally have to bear the consequences for the group decision, it is evident that the element of group discussion to consensus tends per se to encourage increased risk taking.

We turn next to the group responsibility--individual decision condition, where we expected a shift toward conservatism in decision-making. It can be seen that such a conservative shift did, in fact, occur. Note in Table 1 (row 3) that the mean overall shift index is -1.6%. Table 2 (row 2) indicates that this difference score is significantly more conservative than that of the control condition ($t = -2.30$, $p < .02$, one-tailed test). It is evident then that group responsibility per se does function as a conservative agent in decision-making, whereas the process of group decision contributes to increased risk taking. Not surprisingly, as row 5 of Table 2 demonstrates, the two conditions are significantly different from each other.

Having examined the effects on risk taking of group responsibility and of group decision taken one at a time, we turn now to the major inquiry of the study: namely, what happens when both are present simultaneously? As the last two rows of Table 1 show, the results are quite surprising. It is strikingly evident that the two variables under consideration, which operate in antithetical directions when separate, do not algebraically summate, nor does one simply dominate over the other, when they are placed together. Rather, responsibility for others ceases to function as a pressure toward conservatism when it is paired with the force generated by a group seeking consensus in

decision-making. The factor of group responsibility actually seems to change its psychological character and to become, when paired with group decision, a force toward greater risk taking. As rows 3 and 4 of Table 2 indicate, the shifts toward greater risk taking for both group responsibility--group decision conditions are significant well beyond the .001 level by two-tailed tests ($t = 3.76$ and 5.56 , respectively).

How can we account for the fact that these conditions yield such a strong shift toward greater risk taking? Consider first the chance-designation condition where each member has a one-in-three opportunity of being responsible for any particular problem. Is it feasible that this aspect of the task--the one-in-three chance--enhances risk taking? If this factor were critical, however, why should it not function in the same manner under conditions of individual decision? Recall the difference observed in row 2 of Table 2. There, we noted that decisions become more conservative, despite one-in-three odds of being chosen, relative to individual decision-making where a person is responsible for each item.

Evidently, we must look to other sources to explain the substantial risk taking shifts observed when group decision is paired with group responsibility. It is apparent that group responsibility has a very different meaning when a group discussion takes place than when it does not take place. Where there is group discussion to consensus, we would suggest that each member, by drawing support from the others, begins to feel that his fate rests with the group; therefore, greater risk taking is warranted. Given this type of group atmosphere, what are the distinctive forces at work upon group members who know that they will be responsible for the success or failure of the group?

The more risky the character of the group decision, the greater the likelihood that any group member will fail in carrying out his group responsibility. We should like to suggest that such failure would have a quite different meaning

in the case where it has been preceded by group decision than in the individual decision condition. In the latter case, failure would be a heavy burden to bear, for an individual's decision is his alone. The other participants had no voice in its determination; hence, the burden of failure rests squarely on the shoulders of the individual decision-maker. Contrast this with the condition in which the individual member is responsible for carrying out a group decision. If the individual lets the group down, there is the consoling fact that the initial decision was not his alone. The group shares the blame for defeat as much as it shares the credit for success.

The line of reasoning pursued above also applies in the case of the group responsibility--group decision condition in which the group is permitted to designate the group members responsible for carrying out its decisions. While the highest risk taking levels were found in this condition, no significant difference obtains relative to the other group responsibility--group decision condition (Table 2, row 10). In short, it doesn't appear to make too great a difference whether group responsibility is determined by chance processes or by group designation. The latter condition is, however, significantly different from the personal responsibility--group decision condition (Table 2, row 7), while the former is not (Table 2, row 6).

The findings of the present experiment, in sum, support the interpretation that, in a context of actual risks and payoffs, a group-induced shift toward greater risk taking is produced by pressures toward consensus in decision-making. Quite surprisingly, this effect is enhanced rather than diminished when a single group member is to be made responsible for carrying out the group decision. We attempted to account for this result in terms of the diffusion of responsibility that each group member experiences as a consequence of the group decision-making process. Each individual may feel that the group will partially absolve him of blame for possible failure,

given the fact that the individual is acting on a group-derived decision.

Perhaps of especial interest is the pivotal role that is possessed by the factor of communication. While group responsibility in the presence of group decision leads to a strong risky shift, group responsibility in the absence of group decision leads to a conservative shift. This outcome helps to specify what may be responsible for the typical view that the effect of group decision-making is to induce greater conservatism rather than greater risk taking. Greater conservatism will clearly be the result if responsibility for others is created without the opportunity for sufficient communication to consensus. Such blocking of communication may well occur when status inequalities exist among the members of a group. Communication among status equals, on the other hand, results in powerful tendencies toward risk taking.

Shift indices for each type of item. Columns 2 through 6 of Tables 1 and 2 present the data for each type of item taken separately. These item analyses evaluate the uniformity of the obtained effects for the different kinds of item content. From Table 1 we note that the mean shift indices for each type of item considered alone (columns 2-6) exhibit the same general pattern across the five experimental conditions as does the mean overall shift index based on all types of items combined (column 1). If we arrange the conditions in an order running from most risky to most conservative in terms of the mean overall shift index, the analogous orderings of conditions for each type of item separately are maintained in 17 out of the 20 comparisons that can be made (there are four comparisons between adjacent pairs of conditions in the case of each of the five types of items). This finding suggests that the differences in performance among the various experimental conditions are reasonably uniform for the various types of items. The same conclusion is

supported by the t test data in columns 2-6 of Table 2. No particular type of item stands out as making much more or much less of a contribution than any other to the overall differences obtained among the various experimental conditions. Of some interest is the observation that the verbal types of items (antonyms, analogies, sentence completions) and the quantitative types of items (mathematics, spatial relations) operate in ways that are more similar than dissimilar.

Results for Females

Unlike the results obtained in our previous experiment where both males and females exhibited risk taking shifts as a consequence of group decision, the females in the present study do not manifest the dramatic effects obtained in the male sample. However, the overall shift index for the group responsibility--group decision condition where the group designates the responsible member turned out to be significantly larger in the risky direction than the index for any of the other four conditions. Comparing this shift with the shifts in conditions 1, 2, 3, and 4, the t values were 3.68, 3.72, 4.44, and 3.32, respectively.

We shall return later to his exception to the general trend in the female results. At this point, we should note that the intellectual and monetary incentives employed in the present experiment may have had a much lesser impact on the female than the male sample. Such a sex difference is quite consistent with the literature on need for achievement, and might well be anticipated on the basis of relevant evidence (e.g., McClelland, Atkinson, Clark, & Lowell, 1953; Atkinson, 1958; Atkinson, Bastian, Earl, & Litwin, 1960; Atkinson & Litwin, 1960). The basic generalizations that these authors have been able to draw concerning the existence of the achievement need and the nature of

its correlates--including correlates in the area of risk taking--hold for male college students but not for females.

One may well ask what kind of incentive would be most appropriate for a female sample. If it be assumed that incentives focusing on affiliation are more relevant for women, then the greater risk taking exhibited by women in the one experimental condition referred to above becomes comprehensible. A condition in which group members nominate one another to carry out tasks is especially likely to tap affiliation needs in a female sample. Hence, the increased risk taking observed for women in that condition may be more a reflection of the group's overt support of its nominated members, than of any strong need for intellectual achievement or monetary gain.⁴

Theoretical and Practical Implications

Our previous study (Wallach, Kogan, & Bem, 1962) demonstrated that group decision led to an increase in risk taking in a situation where the risks and payoffs involved were hypothetical. The present experiment demonstrates that comparable results are obtained when the decisions concern risks and payoffs that are actual rather than hypothetical. Hence, the effect has been shown to have considerable generality.

We suggested earlier that the mechanism generating this group-induced shift toward greater risk taking is a process of diffusion or spreading of responsibility. This may occur as a result of knowing that one's decisions are being arrived at jointly with others rather than alone. The present experiment sought more explicit evidence on the appropriateness of this interpretation. Group decision per se was found to yield a risky shift. Responsibility for others per se was found to yield a conservative shift. Presence of both elements together, however, was found to generate a very strong shift in the risky direction, indicating that the group responsibility

factor actually changed its character when it was linked with group decision. Despite the conservative influence of group responsibility on decision-making in the absence of group decision, then, the introduction of a consensus requirement overwhelms that influence, yielding marked shifts toward risk taking. Apparently, group decision brings about a diffusion of responsibility in two distinct and separate ways. First, it operates at the level of decision-making itself, pushing decisions in the risky direction. Second, it reduces the felt responsibility of any group member designated to act as the group's representative. In the eyes of the responsible group member, the group shares his responsibility since the decision was a group product. Accordingly, higher risk levels with their associated greater probability of failure can be more readily tolerated than in the case where the group's representative must carry out his responsibility without the opportunity for such communication.

Let us turn now to possible practical implications of the present work. As our previous study emphasized, groups have generally been assumed to exert either a conservative influence on individuals arriving at a group decision (Whyte, 1956) or an averaging influence (Cartwright & Zander, 1960). In short, group decision-making has been claimed to serve a check-and-balance function. The data of the present experiment seriously call into question this assumption.

One area where the implications of our findings may be of the utmost importance is that of military strategy and policy. Consider, for example, a group of military advisers to a chief of state discussing with him the pros and cons of positive military action against a troublesome neighboring state. A consensus has been reached, let us say, on what course to pursue. Compare the above with our group responsibility--group decision conditions. Recall that these conditions produced strong shifts toward greater risk taking.

A similar dynamic may exist in the decision arrangements that the major powers have set up for evaluating information about the imminence of a potential enemy attack. One can anticipate a staff of experts communicating with each other about the import of the information being received. This information, if it has been received early enough to be of any use at all, is likely to be equivocal. Yet if a decision to launch one's nuclear bombs is to be tactically effective, it must come quickly, since one's ability to retaliate is likely to be strongly reduced if one gets hit by the enemy first. (See, for example, Schelling, 1958; Hubler, 1958; Brodie, 1959; Brody, 1960.) It is presumed that the staff of experts, communicating about the meaning of incoming information, will thereby have a conservative, check-and-balance type of influence on one another. Yet, as our experiment has demonstrated, conditions may be present which generate diffusion of responsibility and thereby increased risk taking.

We do not wish to push these analogies too far. The argument might be raised that the problem of nuclear strategy introduces deterrents and risks on so grand a scale that a unique set of forces is at work. Nevertheless, the fact remains that highly critical decisions are being made by groups of men none of whom can claim infallibility. At the very least, then, the possible relevance of the present experimental findings for decision-making arrangements governing military strategy certainly needs to be assayed.

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Footnotes

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²All practice questions and all actual bet questions were obtained from the College Board files of Educational Testing Service. Information as to difficulty levels was available in the case of each question and constituted the basis for question selection. The items used in the present study have not been included in recent CEEB tests and will not appear in future CEEB tests. The authors wish to thank T. F. Donlon, C. T. Myers, and S. S. Myers for their aid.

³Actually, expected value is somewhat higher for the item of 90% difficulty level: all questions are of a five-alternative multiple choice type, thus yielding a 20% probability of obtaining the answer by chance. This point never arose in group discussions, however, so that it plays no role in any of the obtained effects of the group discussion conditions.

⁴Consistent with this interpretation, the experimenter observed that the females in this condition, in contrast to the males, seemed more interested in making sure that no one felt left out than in designating the most competent member for each task.

Table 1

Percentage Degree of Shift in Risk Taking for Each of the Five Experimental Conditions

Experimental Condition	Mean Overall Shift Index	Mean Shift Index for Each Type of Item					Sample Size
		Antonyms	Mathematics	Analogies	Spatial Relations	Sentence Completions	
1. Control	2.4	0.6	-0.6	3.9	6.1	2.2	18 Ss
2. Personal responsibility-- group decision	5.6	4.0	4.2	4.9	4.2	10.7	15 Groups
3. Group responsibility-- individual decision	-1.6	-0.7	-0.7	-6.0	0.0	-0.7	15 Ss
4. Group responsibility-- group decision-- chance designation	9.4	7.3	11.6	8.2	12.2	7.6	15 Groups
5. Group responsibility-- group decision-- group designation	12.5	10.7	14.0	8.0	15.3	14.7	15 Groups

Note.--Positive values indicate a risky shift.

CHOICES

Type of Question _____

PRACTICE QUESTIONS

ACTUAL BET QUESTION

Difficulty levels to choose from Winnings for right answer

Confidence

Answers

10% failed

VS QS MS SS NS

10% failed

17 cents

35% failed

VS QS MS SS NS

20% failed

19 cents

60% failed

VS QS MS SS NS

30% failed

22 cents

85% failed

VS QS MS SS NS

40% failed

25 cents

50% failed

30 cents

38 cents

50 cents

75 cents

90% failed

\$1.50

Answer

a b c d e

Fig. 1. Sample page from the "Choices" booklet. The complete booklet consists of 10 such pages.