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## The Effects of Sex and Levels of Acquaintance on Risk-Taking in Groups

Richard A. Harper

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THE EFFECTS OF SEX AND LEVELS OF ACQUAINTANCE ON  
RISK-TAKING IN GROUPS

by

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Bachelor of Philosophy, University of North Dakota 1966  
Master of Arts, University of North Dakota 1968

A Dissertation

Submitted to the Faculty

of the

University of North Dakota

in partial fulfillment of the requirements

for the degree of

Doctor of Education

Grand Forks, North Dakota

June  
1970



Benlah,

Thank you for your understanding,  
love, and counsel over the years.

Dick Harper



MADE IN  
ENGLAND  
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BOND  
1852  
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WOODWARD & LOVELL



This dissertation submitted by Richard A. Harper in partial fulfillment of the requirements for the Degree of Doctor of Education from the University of North Dakota is hereby approved by the Faculty Advisory Committee under whom the work has been done.

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Signature Richard A. Harger

Date May 11, 1970



Dedicated

to My

Parents

Mr. & Mrs. Percy Harper



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## ABSTRACT

### Problem

This study had three purposes: (1) to test for differences in risk-taking among all male, all female, and mixed-sex groups; (2) to test for differences in risk-taking between low acquaintance groups and high acquaintance groups; and (3) to investigate whether or not familiarity with the risk-taking instrument, the Choice Dilemmas Questionnaire, affected risk-taking.

### Procedure

The subjects used in this study were 144 male and female freshmen who were enrolled in Humanities 101 at the University of North Dakota in the fall semester of 1969. The subjects were randomly selected from the total male and female freshmen population who were enrolled in Humanities 101.

The instrument employed to measure risk-taking in this study was the Choice Dilemmas Questionnaire.

The statistical tests utilized were: (1) two-way analysis of covariance, (2) Scheffé's test, and (3)  $t$  test. The .05 level was established as the criterion for significance for all statistical tests.

### Findings

The findings of this study were as follows:

1. There was a significant difference in risk-taking means among all male, all female, and mixed-sex groups.
2. A significant difference in risk-taking means was found between low and high acquaintance groups.
3. There was a significant difference in risk-taking means as a result of the interaction of sex composition of the groups and the groups' acquaintance level. Specifically, low acquaintance mixed-sex groups took significantly more risks than low acquaintance male groups, low acquaintance female groups, high acquaintance male groups, high acquaintance female groups, and high acquaintance mixed-sex groups.
4. Familiarity with the Choice Dilemmas Questionnaire did not significantly influence risk-taking.

### Conclusions

It was concluded that the sex composition of the groups affects the amount of shift toward risk made by the group members. Moreover, it was concluded that low acquaintance groups take greater risks than high acquaintance groups. Thus, making generalizations from the behavior of low acquaintance groups to high acquaintance groups is inappropriate.

Furthermore, the results indicate that sex and acquaintance level should be considered together when investigating risk-taking behavior in groups. Finally, it was concluded that familiarization does not influence risk-taking behavior.



## CHAPTER I

### INTRODUCTION

#### Background

A great deal of research has been generated over the years comparing the performances of groups with the performances of individuals. Allport (1924, Chapter 11) summarizes the research in this area prior to 1920. The concern at this time was with intellectual tasks, for example, rote memory of words and multiplication tests. He indicated that groups were more efficient and productive than individuals. Other early writers (Watson, 1928; Shaw, 1932; Thorndike, 1938) were also interested in the intellectual efficiency of groups as compared to individuals. Their findings also indicated that the group product was superior.

Later, variables other than intellectual efficiency were investigated. Sherif (1936) using the autokinetic effect, found that there was a convergence of responses when individuals performed required tasks in groups of two or three. That is, they established group norms. He states that "social norms arise from actual life situations as a consequence of the contact of people with one another" (p. 198). In a classic study investigating the effects of group influence on the decision making behavior of single subjects, Asch (1956) found that many subjects changed their judgments to those of the group.

A more recent research effort, comparing group and individual performances, has concerned itself with risk-taking. Several studies have shown that groups take more risks than individuals (Pruitt & Teger, 1969). Stoner (1961), using male graduate students in industrial management, discovered that subjects became more risky in a group setting than they were as individuals.

Since 1961 this shift toward risk, now referred to as the risky-shift phenomenon, has been found across a variety of populations, including college students from various countries (Bateson, 1966; Rim, 1963, 1964a, 1964b), psychiatric clinic teams (Siegel & Zajonc, 1967), and senior business executives (Marquis, 1962). A variety of methods has been used to assess risk-taking. Two of these were choices among college board items of varying difficulty (Wallach, Kogan, & Bem, 1964) and choices among probability of painful side effects (Bem, Wallach, & Kogan, 1965). Most of the research, however, has utilized the "choice dilemmas" questionnaire developed by Wallach and Kogan (1959, 1961).

Several studies have attempted to explain why the risky-shift phenomenon occurs. Some of these studies have focused on individual and group responsibility (Wallach et al., 1964), leadership (Rim, 1963, 1964a, 1964b), and group size (Teger & Pruitt, 1967).

#### Statement of the Problem

This study had three purposes. The first was to determine whether or not differences existed in risk-taking among all male, all female, and mixed-sex groups. A random sample of freshmen students who were enrolled in Humanities 101 at the University of North



Dakota in the fall semester of 1969 was used to investigate this purpose. The second purpose was to determine whether or not differences existed in risk-taking between low acquaintance groups and high acquaintance groups. The subjects used to investigate this purpose were the same as those described above. The third purpose of this study was to investigate whether or not familiarization with the testing instrument affected risk-taking. Two samples of low acquaintance subjects were utilized to investigate this problem.

#### Research Questions

This study sought to answer the following research questions:

1. Are there differences in risk-taking among all male, all female, and mixed-sex groups?
2. Are there differences in risk-taking between low acquaintance groups and high acquaintance groups?
3. Does familiarity with the risk-taking instrument, the Choice Dilemmas Questionnaire, affect risk-taking?

#### Delimitation of the Study

This investigation was conducted within the framework of the following delimitation:

1. This study was concerned with male and female freshmen students at the University of North Dakota who were enrolled in Humanities 101 during the first semester of the 1969-1970 academic year.

### Limitations of the Study

1. It was assumed that the instrument used to measure risk-taking for this study was a reliable and valid instrument for that purpose.
2. The sample was assumed to be a random sample of freshmen students enrolled in Humanities 101.

### Significance of the Study

Studies of the risky-shift have indicated that all male, all female, and mixed-sex groups shift toward risk. However, no study to date has compared all male, all female, and mixed-sex groups with one another on risk-taking. Therefore, this study made such a comparison. Moreover, a major criticism of studies of the risky-shift is the tendency to generalize the findings from low acquaintance groups to high acquaintance groups. Therefore, the present study, which used both low and high acquaintance level groups, investigated the legitimacy of making this type of generalization. Finally, past research has indicated that mere familiarization with the risk-taking instrument might account for the shift toward risk. Therefore, the present investigation attempted to determine whether or not familiarization with the risk-taking instrument (Choice Dilemmas Questionnaire, Appendix A) affected risk-taking.

### Definition of Terms

Choice Dilemmas Questionnaire--A twelve-item questionnaire that measures the degree of risk that a subject would take if placed in selected life situations.



Discussion-Without-Consensus Method--A method in which the individual members of the group make their decisions independently after group discussion; group consensus is not required.

Low Acquaintance Group--A group of four subjects formed from a recitation section of Humanities 101 students. The group was formed the first time the recitation section met, and consisted of subjects who reported that they had not known one another prior to the formation of the group.

High Acquaintance Group--A group of four subjects formed from a recitation section of Humanities 101 students. This section met once a week for two hours throughout the first semester of the 1969-1970 school year. The group was formed after the recitation section had been meeting approximately two and one-half months, and consisted of subjects who reported that they had not known one another prior to the two and one-half month period.

Risky-Shift Phenomenon--A shift toward risk exhibited by group members, after group discussion, compared to their risk level prior to group assignment.

#### Organization of the Study

The remainder of this study is organized in the following manner: Chapter II presents a review of the literature related to individual and group risk-taking. Chapter III contains a description of the source of data and research population, the instrument, and methodology employed in this study. Chapter IV reports the results of the statistical analysis. Chapter V discusses these results, draws conclusions, and suggests some recommendations for further research.

## CHAPTER II

### REVIEW OF THE LITERATURE

#### Decision Making By Individuals

Although this study is concerned with risk-taking in groups, it may be informative to review the general area of decision making behavior by individuals. To begin, Edwards (1954) reviews the literature on decision making between 1930 and 1954 and indicates that the focus of research prior to 1944 was on gambling and probability in mathematics. After 1944, the concept of utility, or the subjective value of reward to the individual, was employed in investigations of decision making. According to this view, choices among risky alternatives are made in such a way that they maximize expected utility.

Many other authors have also been interested in gambling behavior. Ziller (1957a) felt that gambling set could be measured by an objective test. Liverant and Scodel (1960) found that those individuals who bet on the basis of hunches or the outcome of previous trials made significantly riskier bets than those individuals who develop and employ a general overall strategy in an attempt to maximize the number of favorable outcomes. However, Strickland, Lewicki, and Katz (1966) in conducting a similar type study found just the opposite results. Edwards (1962) agrees with Strickland et al. (1966). He found that individuals' choices among gambles are essentially independent of the



amount of money won or lost on previous trials. Edwards (1962) also stated that "theories about how people make decisions in risky or uncertain situations have come to focus on two concepts: utility or subjective value and subjective probability" (p. 109).

Studies dealing with risk-taking have been conducted in areas other than gambling. Ziller (1957b) found that individual risk-taking tendencies determine, in part, occupational choices. McClelland's (1958) findings indicated that children with high need achievement tended to take moderate risks and children with low need achievement preferred either very safe or very speculative enterprises.

Ethical and unethical behavior in connection with risk-taking has also been of interest to researchers (Rettig & Rawson, 1963; Rettig & Pasamanick, 1964; Rettig & Sinha, 1966). These studies suggested that unethical behavior varies as a function of the perceived risk resulting from such conduct and can be best explained in terms of the reinforcement value of censure. Situations involving censorship might well give a prediction as to whether or not individuals will consider making risky decisions.

Hope of success and fear of failure in relationship to risk-taking behavior have been investigated by Hancock and Teevan (1964) and de Charms and Davé (1965). However, their studies produced different results. The nature of the task performed might explain these differences; de Charms and Davé's study involved a straight motor task while Hancock and Teevan's dealt with betting. Both studies hypothesized that those individuals who had the greatest fear of failure would choose more difficult odds than those individuals who

had had hope of success. The hypothesis was confirmed in Hancock and Teevan's study but not in de Charms and Davé's.

### Decision Making By Groups

Kogan and Wallach (1967c) have proposed three possible types of group decisions:

1. a group decision may represent the average of the degree of risk-taking recommended by the various members when deciding as individuals;
2. the group decision may be more conservative than this average; or
3. the group decision may be more risky than this average (p. 228).

Based on Sherif's study (1936) it might be expected that a group decision represents some type of group norm or average. Cartwright and Zander (1960) have emphasized the pressure toward conformity on the individual in a group situation. An averaging effect in groups, therefore, would be expected, with deviant members being pulled toward the mean. Support for the "averaging effect" idea was also provided by Lonergan and McClintock (1961).

A second possible type of group decision refers to decisions that may be more conservative than the group average. Barnlund (1959) found this to be the case. He had his subjects draw logical conclusions from given arguments and concluded that, "Knowledge that one's opinions were to be shared publicly made group members more cautious and deliberate in their own thinking" (p. 58). Atthowe (1961), who had dyads choose between two alternative wagers based on the rolling of a die, stated that "the dyadic resolution of a decision conflict was conservative in strategy" (p. 119). The reasoning advanced in these two studies was that groups take greater care in making decisions and



are more self-critical than individuals. Thus, groups should be more conservative than individuals with regard to decision making.

The third possible type of group decision is that groups are more risky in decision making than individuals. Brown (1965) indicates that a master's thesis by Stoner (1961) was the start of research in this direction. Stoner used problems developed by Wallach and Kogan (1959, 1961). These twelve "Choice Dilemmas" (Kogan & Wallach, 1964) portray a situation in which a central figure is confronted with six alternative actions whose outcomes differ in their attractiveness and probability of occurrence. The subjects are instructed to advise the central figure and to indicate the minimum probability of success they would require before recommending the more risky alternative, but the one which if successful would have the greater reward. After the subjects respond to the Choice Dilemmas, they are placed in a group and the questionnaire is readministered with instructions to reach consensus on the twelve items. The average of the individual decisions is then compared to the group consensus score, and the resulting difference is the shift score. Stoner's (1961) subjects were all male graduate students in industrial management. He found that something in the group discussion influenced private opinions in the direction of greater risk. Marquis (1962) using subjects drawn from middle-aged male business executives obtained the same results. Wallach, Kogan, and Bem (1962) replicated Stoner's study but used liberal art male and female undergraduates as subjects. Again the shift toward risk occurred, and it occurred for both female and male groups. Since Stoner's report in 1961, approximately 40 studies have been conducted in this area. Almost all

of them have confirmed the tendency for groups to take greater risks than individuals on the life-situation cases (Marquis & Reitz, 1969).

The weight of research evidence is decisively in favor of the shift to risk from the individual to the group decision. Two reasons present themselves to explain why this is so. First and foremost is the task itself. Crutchfield (1956) and Endler (1965) have pointed out that conformity is less common when it involves such things as personal attitudes and more common with ambiguous stimuli. Viewed in this light, it is not surprising that Sherif's study (1936), for example, supported the concept of a group norm or average. Secondly, it is open to question whether or not the studies cited concerning the averaging and conservative possibilities placed much emphasis on the group process. That is to say in those studies group discussion was not sufficient to produce a shift toward risk. Therefore, it is tenuous to say that a group moves toward an averaging or conservative direction in light of the evidence supporting a shift toward risk. It should be kept in mind that the nature of the task and the group process, especially group discussion, play a major part in the shift toward risk.

#### Explanations of the Risky-Shift Phenomenon

Several reasons are discussed by Kogan and Wallach (1967c), Brown (1965), and Kelly and Thibaut (1969) to explain the risky-shift phenomenon. Basically they are as follows:

1. Risk is a cultural value.
2. Information about the task is gained during the group discussion.



3. Risk-takers become the leaders in the group and influence the group's decisions.
4. Diffusion-of-responsibility occurs when making group decisions.

#### Risk as a Cultural Value

Brown (1965) is a leading proponent of risk as a cultural value. He feels that culture places emphasis upon the taking of risks in certain situations. The Choice Dilemmas Questionnaire, he contends, is composed of problems that tap this value of risk. Brown (1965) reasons that an individual may believe that he has taken a high risk in making his individual decision, but when he confronts others in group discussion, he discovers that he is not as risky as he thought he was. Thus his decision becomes riskier in the group situation, and as a result, the risky-shift occurs.

Implicit in explaining the risky-shift as a cultural value is the idea of an information exchange. That is, the group discussion on the task provides information to all the group's members about their initial decision. This information helps establish a frame of reference with which the individual can compare his level of risk-taking. The result of this comparison helps to establish the decision the individual will make in the group situation.

Hinds (1962) found that subjects consistently rate themselves as very similar to, but more risky than, their fellow group members. However, this "pluralistic ignorance" is shattered as the group begins to discuss the issue. The group member realizes he can indeed adopt riskier alternatives, as his initial choices were too conservative in

view of other people's opinions. Thus the group function is to provide information about the distribution of judgments made by members of the group.

Wallach and Kogan (1965) put forth what they considered to be a direct test of the information exchange hypothesis. They had the subjects, after their individual, private judgments on the Choice Dilemmas, reach consensus as a group by successive rounds of balloting. No discussion was permitted, but each member was informed about the successive distributions of opinions in the group. Thus they had information on which to base their decisions. No shift toward risk occurred, but rather an averaging effect. There was a shift toward risk, however, when discussion was allowed. They suggested that the "affective bonds formed in discussion" facilitate a diffusion-of-responsibility onto other group members. They felt this diffusion-of-responsibility, which will be discussed later, encouraged a shift toward risk.

Wallach and Kogan's (1965) results are in question, however, because the method they employed seemed to encourage the averaging effect in two ways. One way was the requirement of the groups to reach consensus. Because they were not allowed to communicate, the group members could not argue their own viewpoints in an effort to change the opinions of others. Thus, the only road open to them to reach consensus was to move toward the group average. A second criticism of Wallach and Kogan's (1965) study was that they told their subjects that their recommendations should take into account "both of what you believe the group can agree on and what you believe the group should agree on" (p. 9). Such instructions might conceivably



have led the subjects to choose alternatives corresponding closely to their initial mean since this was the most obvious point on which the group could agree.

Teger and Pruitt (1967) conducted an experiment which, among other things, sought to take into account the above two criticisms. Their results showed a significant shift toward risk, and they interpreted this finding as supporting the value theory.

Rabow, Fowler, Bradford, Hofeller, and Shibuya (1966) also conducted a study in risk-taking that supports Brown's value theory. They felt that shifts in decision making would depend on the norms that respondents could utilize in their group discussions. They concluded that "the nature of the relevant norms must be taken into account to understand the relationship between group and individual decisions involving risk" (p. 16). Rettig and Turoff's (1967) results suggest that at least part of the risky-shift must be attributable to the process of the information exchange. Their contention was that the group provides information regarding the social value of risk and that the physical presence of the other group members is needed before the risky-shift can take place. Other studies favoring Brown's value theory have been conducted by Madaras and Bem (1968), Wallach and Wing (1968), Blank (1968), Stoner (1968), Willems (1969), Levinger and Schneider (1969), and Pruitt and Teger (1969).

Kogan and Wallach (1967d) report results which conflict with the information exchange hypothesis at first glance. They studied the effects of interacting groups and listening groups (groups who listen to the tapes of the interacting groups) on the risky-shift. They

found that the interacting groups were significantly higher than the listening groups in risk-taking and concluded that the information exchange hypothesis was not supported. However, both the interacting and listening groups had a significant increase in risk-taking. Therefore, their results could just as well be interpreted in favor of the information exchange concept. A study by Lamm (1967) also casts Kogan and Wallach's (1967d) conclusions in a questionable light. He found that both listeners (individuals who listen to the group in a separate room) and viewers (individuals who view and listen to the discussion behind a two-way mirror) shifted toward risk about as much as an interacting group. He concluded that the information exchange was supported by his study.

Studies which dealt with familiarization with the testing instrument can be assimilated into Brown's (1965) cultural value of risk theory. Bateson (1966) and Flanders and Thistlethwaite (1967) had their subjects assemble additional arguments in preparation for a group debate of the Choice Dilemmas problems. Even though no group interaction took place, a significant shift toward risk occurred which was as large as typically elicited by the group discussion. These individual shifts obtained in their studies could be due to a culturally induced predisposition to consider and favor risk arguments when anticipating group discussion.

#### Risk and Information About the Task

A second explanation of the risky-shift is information about the task. According to this view, improved comprehension leads to a more adequate understanding of the expected returns for risk versus non-risk alternatives. This would imply that if the expected value of the



riskier alternatives is higher than that of the conservative alternatives, one would shift toward greater risk. The group discussion is looked upon as a means of eliminating errors and increasing the level of information for an individual.

This explanation has not been confirmed. Wallach et al. (1964) found that groups chose to attempt more difficult and, therefore, more risky aptitude problems (questions from the College Boards) even though expected monetary returns were equal for answering any of the items correctly. Bem et al. (1965) conducted a study in which subjects risked physical discomfort in groups by choosing riskier alternatives which had decreased expected returns. The "rational" decision has not been supported. Kogan and Wallach (1967c) stated that, "the proposal that groups shift toward greater risk-taking because the decision tasks are of such a nature as to make risk-taking more rational than conservatism thus does not seem supported" (p. 254).

Familiarization with the testing instrument could be related to information about the task. Two studies have dealt specifically with the issue of familiarization with the testing instrument. Bateson (1966) did a study to determine the effects of familiarization with the Choice Dilemmas Questionnaire. He found that familiarization with the risk-taking task caused an increase in riskiness in both individual and group situations. Bateson concluded that although familiarization with the risk-taking task was found to cause increased riskiness, other factors may have also contributed to the increase in risk (e.g., the group process itself). Bateson's results are somewhat open to question, and he himself is quite clear on the limitations of his study, the size of

his groups (two and three people), and the use of but five of the twelve items of the Choice Dilemmas Questionnaire. Bateson received strong support, however, from Flanders and Thistlethwaite (1967). They felt that the risky-shift could be explained by familiarization with the instrument.

Pruitt and Teger (1969) did not concur with Bateson, and Flanders and Thistlethwaite. They replicated the two studies four times and could not obtain their results. Marquis (1968) has extended the value hypothesis to include familiarization to help explain the risky-shift. Wallach and Wing (1968) are in accord with Marquis and concluded that although the cultural value of risk is the major explanation of the risky-shift, familiarization with risk-taking materials also seems to play a role. To summarize, it appears that familiarization with the testing instrument might be a contributing factor and should be taken into account when conducting research on risk-taking, especially when using the Choice Dilemmas.

#### Risk and Influential Group Members

The third explanation of the risky-shift is whether or not high risk-takers become the leaders in groups and influence the groups' decisions. This "leadership" hypothesis was derived from correlational evidence which indicated that risk-takers were the more influential members of the group (Wallach et al., 1962; Rim, 1963, 1964a, 1964b; Wallach, Kogan, & Burt, 1965). However, Kogan and Wallach (1967b) did not find this relationship. Moreover, Flanders and Thistlethwaite (1967) concurred; they found no evidence in their study which would indicate that high risk-takers influenced



the group decision. Hoyt and Stoner (1968) also rejected the idea that high risk individuals influence the group; they felt that greater persuasiveness as a general attribute of high risk-takers does not explain the risky-shift phenomenon.

#### Risk and Diffusion-of-Responsibility

Diffusion-of-responsibility is a process that enables individuals to feel less responsible for the consequences of the decisions made while members of a group than they would feel had they made the decisions on their own. Thus, a group would accept greater risk than an individual because the individual would be deterred by his feeling of sole responsibility for possible failure. Kogan and Wallach (1967c) have been the leading exponents of this view.

Several studies support the diffusion-of-responsibility hypothesis as an explanation of the risky-shift (Wallach et al., 1962, 1964; Bem et al., 1965; Wallach & Kogan, 1965; Wallach, Kogan, & Burt, 1967; Kogan & Wallach, 1967b). However, several other studies have not supported this hypothesis. Madaras and Bem (1968) indicated that the support of this hypothesis has come only from indirect kinds of evidence which were designed primarily to rule out other explanations. Rettig (1966) in a study dealing with unethical behavior and risk-taking also rejects the diffusion-of-responsibility explanation; he feels it can be best explained in terms of the cultural value of risk. Lamm (1967) concluded that the information exchange hypothesis was supported by his study rather than the theory of diffusion-of-responsibility. Wallach and Wing (1968) indicated that the diffusion-of-responsibility concept was the least probable

explanation for the shift toward risk in groups. They supported Brown's (1965) interpretation primarily, but also felt familiarization seemed to play a role in explaining the risky-shift. Three other studies concluded that the diffusion-of-responsibility theory was inadequate in explaining the risky shift (Zajonc, Wolosin, Wolosin, & Sherman, 1968, 1969; Pruitt & Teger, 1969).

On the basis of these studies, it appears that diffusion-of-responsibility is inadequate to explain the risky-shift. This conclusion is strengthened by the fact that two of the authors, Wallach and Bem, who originally championed this explanation, now favor the value of risk theory (Madaras & Bem, 1968; Wallach & Wing, 1968).

#### Studies Where the Risky-Shift Did Not Occur

Nordhøy (1962) first developed problems that resulted in the decision after discussion becoming more cautious. Zajonc et al. (1968, 1969) also found a shift toward caution in studies related to a two-choice betting situation. Clark and Willems (1969), using six items from the Choice Dilemmas Questionnaire, found that instructions affect the risky-shift. They removed the word lowest from the instructions and found no shift toward risk. They felt their results showed clearly that risk-oriented instructions somehow cued the direction of risk while neutral instructions did not. Rabow et al. (1966) and Chandler and Rabow (1969) developed problems related to the Choice Dilemmas which also resulted in a shift toward caution. Actually, in these two studies the authors used questions which also shifted toward greater risk and some that remained at the mean of the initial individual choices. What these authors essentially found was that the nature



of the task might either produce more cautious or more risky results. Stoner (1968) clarifies this issue by designing a study using his own questionnaire. Four of his items were from the Choice Dilemmas Questionnaire, two were constructed by Nordhøy (1962), and he added six of his own. The items were designed to measure both risky and cautious shifts. Stoner's subjects tended to be risky on items for which widely held values favor a risky decision. On items for which widely held values favored a cautious decision, the subjects tended to be cautious. Marquis (1968) and Marquis and Reitz (1969) confirmed Stoner's (1968) results and felt that the group discussion enhances prior expected values in either a risky or a cautious direction. When relative values favored the risky alternative, groups made riskier decisions than individuals. When relative values favored the cautious alternatives, group decisions were more cautious than individual decisions. "It is not unreasonable to speculate that the effect of group discussion is to clarify the expected value, and to shift the choices more risky or more cautious on this basis" (Marquis & Reitz, 1969, p. 288).

The proposed cultural value theory (Brown, 1965), based on information exchange occurring in the group, is in the strongest position to explain shift. The cultural value, therefore, can account for cautious shifts as well as for the "risky-shift phenomenon." In view of the research done in the area of shift, the phenomenon of a group-induced risky-shift would seem to have considerably more generality in our society than a group-induced shift toward caution.

### Personality and Risk-Taking

Several studies have been conducted relating risk-taking to different variables. One variable is the personality of group members. In a study dealing with field-dependence and field-independence of group members, Wallach et al. (1967) found that both field-dependent and field-independent males shifted toward risk after group discussion. The results were inconclusive for females in this study. Kogan and Wallach (1967b) investigated risk-taking in women as a function of members' anxiety and defensiveness levels. Using different scales to measure high and low defensiveness, and high and low anxiety, they found that all group types have significant risky-shifts.

Rim (1963, 1964a, 1964b) did a series of studies relating personality types and risk-taking. He felt that need for achievement (Rim, 1963) and neuroticism and extroversion (Rim, 1964a) may be useful constructs in predicting individual risk-taking behavior as well as group risk-taking behavior. Those subjects scoring high on need achievement were riskier in their initial choices and shifted less in group decisions than those scoring low on need achievement (Rim, 1963). For both neuroticism and extroversion there was a significant shift toward risk. Those subjects who scored highest on extroversion shifted the most. Rim's other study (1964b) dealt with social attitudes. He investigated the dimensions of radicalism-conservatism and tough mindedness-tender mindedness and concluded that social attitudes would be useful in predicting individual and group risk-taking behavior.

In general, these studies give more testimony for the robustness of the risky-shift phenomenon. However, because of the few studies



done and various methodological problems (especially with Rim's work), the results are not that conclusive. It appears that the area of personality and risk-taking is in need of further research.

#### Sex Differences and Risk-Taking

Sex differences is another variable which has been related to risk-taking. Komarovsky (1950), in an attempt to outline a theoretical orientation for research on sex roles in our society, pointed out the greater dependence of females. Slovic (1966) felt that boys become more daring than girls by age eleven. In a free choice repetitive play situation with children (Kass, 1964), boys preferred probabilities of winning involving greater risks than did girls. Crandall (1965), in examining the relationship among sex, anxiety, and conservatism of judgment, found that men were less conservative than women on tasks calling for affectively neutral judgments, whereas the opposite was true for tasks of affectively non-neutral evaluations. Anxiety affected the sexes differently in that highly anxious males were more conservative than less anxious males. The opposite was true for females.

Kogan and Wallach (1964, 1967c) have pointed out that little research has been directed specifically to the problem of sex differences in risk-taking behavior, and they indicated the need for it. They felt that "sex constitutes an important and interesting moderator variable in its own right" (Kogan & Wallach, 1965, p. 86). Furthermore, they related that their results suggest that women's decision making performances are more strongly determined by internal dispositions than those of men. Men's risk-taking behavior is more

strongly influenced by what the external situation has to offer. This coupled with the works of Slovic (1966) and Kass (1964) would suggest the probability that men are more prone toward risk than women. Slovic and Kass's work suggest a male predisposition toward risk while Kogan and Wallach (1965) are implying that the external situation, the group discussion, would more influence the males. Wallach and Kogan (1959) found that the risk differences on the Choice Dilemmas depended on the values of these content areas for members of each sex. These results suggest sex differences in risk-taking behavior.

In examining sex differences, Wallach et al. (1962) found a significant shift toward risk for both males and females although there was no significant differences between the two sexes. However, when tested two to six weeks later, only males exhibited the risk-taking behavior they had established as a result of the group discussion. In another study done by the same authors (Wallach et al., 1964), females did not exhibit the dramatic risk-taking shifts that males did.

Several other studies have used male subjects and female subjects (Wallach & Kogan, 1965; Wallach et al., 1965, 1967; Bateson, 1966; Pruitt & Teger, 1969). Their results showed a significant shift toward risk for both sexes. Wallach et al. (1965) investigated sex differences to explain the trend toward verticality in judgments. They found that males exhibited stronger assimilative projection (i.e., attributing one's own shift behavior to the group's influence), and the females manifested greater genuine awareness. In a study by Wallach et al. (1967) on field-dependence and field-independence, the results for females were inconclusive.



Other studies conducted have used only male populations (Bem et al., 1965; Teger & Pruitt, 1967; Kogan & Wallach, 1967a; Flanders & Thistlethwaite, 1967; Lamm, 1967; Blank, 1968; Hoyt & Stoner, 1968). Still other studies have dealt with just female populations (Kogan & Wallach, 1967b, 1967d). Rim (1963, 1964a, 1964b) used mainly mixed-sex groups. All of these studies mentioned using male populations, female populations, and mixed-sex populations, resulted in a shift toward risk. However, they tell little about differences which might result in risk-taking behavior when groups composed of all males, groups composed of all females, and mixed-sex groups are compared with each other.

There seems to be little doubt that risk is a value for both males and females (Wallach & Wing, 1968), but it is open to question as to what degree. Kogan and Wallach (1964) felt that on intuitive grounds there is every reason to suspect that the psychological meaning and implication of risk-taking might differ for males and females.

#### Group Size and Risk-Taking

Group size is yet another variable that has been related to risk-taking behavior. Only one study was found that was directly concerned with the question of group size and the risky-shift phenomenon (Teger & Pruitt, 1967). In this study 165 undergraduate males in groups of three, four, and five were investigated. They found that group size was positively related to the extent of the risky-shift. The larger groups (four and five-man) showed a significant shift toward risk whereas the smaller three-man discussion groups failed to show a significant shift toward risk. It will be recalled that Lonergan and

McClintock (1961) did not find a shift toward risk, but rather a convergence of individual bets toward a common norm. They had used groups of three. Their small group size might be a possible explanation of why they did not obtain a risky-shift. However, other studies (Wallach et al., 1964; Bem et al., 1965; Bateson, 1966; Flanders & Thistlethwaite, 1967) using a group size of three all obtained the risky-shift.

It appears that group size is another area that is in need of investigation to clarify its relationship to the risky-shift phenomenon. Previous research has indicated that a group size of four would be sufficiently large to produce the risky-shift. For example, Carter, Haythorn, Lanzetta, and Mairowitz (1951) felt that groups of four allow sufficient "space" for individuals to interact, that is, express their abilities and ideas, while in larger groups only the more forceful individuals are able to express their abilities and ideas.

#### Low and High Acquaintance Groups and Risk-Taking

A fourth variable considered is the relationship of low and high acquaintance groups to risk-taking. Acquaintance level of group members is a major variable in this area. Lorge, Fox, Davitz, and Brenner (1958) in a survey of studies from 1920-1957 called attention to the fact that the preponderance of investigations have used ad hoc rather than established groups. They felt researchers might be following a potentially misleading practice of generalizing principles valid for aggregates of strangers to established groups. "A common and dangerous practice is to generalize the principles valid for ad hoc groups to traditional groups" (Lorge et al., 1958, p. 338).



Hall and Williams (1966) noted that few studies have dealt with the issue of comparing the two types of groups to get a direct test of the validity of these cross generalization practices. Therefore, they conducted a study to compare the decision making performances of established and ad hoc groups. They found established groups significantly superior to ad hoc groups in decision making. The two types of groups handled conflict differently. Ad hoc groups tended to avoid conflict before it arose by producing neutral emergent products which were devoid of individual members' vested interests. In other words they compromised. On the other hand, established groups reacted to conflict with increased creativity. Hall and Williams (1966) concluded that "it can be said that established and ad hoc groups differ in their approaches to decision making" (p. 221).

In research investigating the risky-shift phenomenon little concern has been given to the acquaintance level of the group members. Siegel and Zajonc (1967) used established groups of three, composed of a psychiatrist, a psychologist, and a social worker, to determine whether or not the risky-shift phenomenon occurred under realistic conditions. They used six items from the Choice Dilemmas and six "clinical choice dilemmas" especially constructed for their study. Their results supported the risky-shift phenomenon for both the clinical and non-clinical items. They concluded that ad hoc and established groups appear rather similar. In other words, they showed that established groups exhibited the risky-shift phenomenon which had been obtained from only ad hoc groups previously. Their study, however, did not make any comparison between ad hoc and

established groups. Rather it indicated that using the Choice Dilemmas in both ad hoc and established groups produced the risky-shift phenomenon.

Rabow et al. (1966), noting that most studies concerned with the risky-shift phenomenon used ad hoc groups, tried to place subjects in groups where they would be likely to know one another. They argued that this procedure would reduce the amount of shift for two reasons. One, there would be less variance on initial choices for well acquainted groups, thus reducing the need to discuss the problems. And two, high acquaintance would reduce shift because of the impact on the group discussion itself (i.e., people who know one another are more likely to compromise). Rabow et al. (1966) found no significant difference between high and low acquaintance groups but concluded that "high acquaintance groups make a disproportionate contribution to the conservative shift found in the conflict items" (p. 23). Chandler and Rabow (1969) compared families to groups composed of people who did not know one another. They found families to be more conservative than complete strangers on items from the Choice Dilemma Questionnaire.

In sum these studies point out that level of acquaintance may affect risk-taking, but that additional investigations of the effects of level of acquaintance are needed.



## CHAPTER III

### METHOD

#### Source of Data and Research Population

The data used in this study were obtained from the administration of the Choice Dilemmas Questionnaire. This information was gathered during the first semester of the 1969-1970 academic year from male and female freshmen students who were enrolled in 101 Humanities recitation sections at the University of North Dakota. There were 32 recitation sections of about 20 students each that were open to freshmen. Thus, approximately 640 freshmen students composed the research population from which a random sample of 144 was drawn for use in the present study.

#### Instrument

The instrument used in this study was the Choice Dilemmas Questionnaire developed by Wallach and Kogan (1959, 1961) and published in its entirety in Kogan and Wallach (1964, Appendix E). The Choice Dilemmas Questionnaire consists of twelve items each dealing with hypothetical life situations that cover a wide range of content with regard to the types of risk involved, from risk of monetary loss, risk of loss of prestige, to risk of death. As an example, item one is presented below:

Mr. A, an electrical engineer, who is married and has one child, has been working for a large electronics corporation since graduating from college five years ago. He is assured of a lifetime job with a modest, though adequate, salary, and liberal pension benefits upon retirement. On the other hand, it is very unlikely that his salary will increase much before he retires. While attending a convention, Mr. A is offered a job with a small, newly founded company which has a highly uncertain future. The new job would pay more to start and would offer the possibility of a share in the ownership if the company survived the competition of the larger firms.

Imagine that you are advising Mr. A. Listed below are several probabilities or odds of the new company's proving financially sound.

PLEASE CHECK THE lowest PROBABILITY THAT YOU WOULD CONSIDER ACCEPTABLE TO MAKE IT WORTHWHILE FOR MR. A TO TAKE THE NEW JOB.

The chances are 1 in 10 that the company will prove financially sound.

The chances are 3 in 10 that the company will prove financially sound.

The chances are 5 in 10 that the company will prove financially sound.

The chances are 7 in 10 that the company will prove financially sound.

The chances are 9 in 10 that the company will prove financially sound.

Place a check here if you think Mr. A should not take the new job no matter what the probabilities.

Generally, in the administration of the Choice Dilemmas Questionnaire, individuals are instructed to advise a central figure (Mr. A in the above example) who is confronted with a decision in each of the twelve items. He can advise the central figure to attempt the task if the odds of success are 1/10, 3/10, 5/10, 7/10, 9/10, or indicate that under no circumstances should the central figure attempt the task, a response that is scored as 10/10. An overall score is obtained by summing the probability levels for all twelve items. Thus, the score for an individual could range from 12 to 120. Should an individual choose a 1 in 10 response for each item, in other words advise the central figure to take the greatest risk, his total score would be



12. Should an individual choose a 10 in 10 response for each item, in other words advise the central figure to take no risk at all, his total score would be 120. Thus the lower the score, the greater the risk. The Choice Dilemmas Questionnaire is reproduced in Appendix A of this study.

#### Reliability and Validity

Previous research with the Choice Dilemmas Questionnaire has provided information concerning its reliability and validity. An odd-even reliability coefficient was determined for the Choice Dilemmas using the Spearman-Brown formula on various age and sex samples (Wallach & Kogan, 1961). They found reliability coefficients of .53 for young males, .63 for young females, .80 for older males, and .80 for older females. Also using corrected split-half reliabilities, Kogan and Wallach (1964) discovered reliability coefficients of .53 for males and .62 for females. In addition, test-retest product-moment correlation coefficients of .78 for males and .82 for females have been obtained one week after administration and under instructions encouraging change (Wallach *et al.*, 1962). Finally, Kogan and Wallach (1964) indicate that the reliability of the Choice Dilemmas can be considered satisfactory for a twelve-item test.

With respect to validity, relationships between scores on the Choice Dilemmas Questionnaire and various types of risk-taking behaviors have been demonstrated (Kogan & Wallach, 1964). Table 1 lists the correlations between the Choice Dilemmas and risks based strictly on chance (dice bets).

TABLE 1

CORRELATIONS BETWEEN THE CHOICE DILEMMAS AND SELECTED CHANCE STRATEGIES FOR MALES (N=114) AND FEMALES (N=103)

Chance Strategy	Males	Females
Maximum of Gain	-.33**	-.22*
Minimum of Loss	.21*	.22*
Long Shots	-.31**	-.17

\*p <.05

\*\*p <.01

In the same study, Kogan and Wallach compared the Choice Dilemmas scores with risks based on a contest of skill (playing shuffleboard). The correlations between these variables are reported in Table 2.

TABLE 2

CORRELATIONS BETWEEN THE CHOICE DILEMMAS AND SELECTED SKILL STRATEGIES FOR MALES (N=114) AND FEMALES (N=103)

Skill Strategy	Males	Females
Maximum of Gain	-.26**	-.14
Minimum of Loss	.25**	.09
Long Shots	-.21*	-.14

\*p <.05

\*\*p <.01

In addition Kogan and Wallach (1964) investigated the relationships between selected personality variables and the Choice Dilemmas



Questionnaire for males and females. These correlations are shown in Table 3.

TABLE 3

CORRELATIONS BETWEEN THE CHOICE DILEMMAS AND SELECTED PERSONALITY VARIABLES FOR MALES (N=114) AND FEMALES (N=103)

Personality	Males	Females
Self-Sufficiency	-.16	-.27**
Independence	-.12	-.42**
Rigidity	.26**	.26**

\*\*p < .01

Interpretation of Tables 1 and 2 suggests that scores on the Choice Dilemmas Questionnaire are significantly related to risks based on chance for both males and females, and to risks based on skill for the males. Moreover, Table 3 reveals that males and females who are identified as rigid tend toward caution on the Choice Dilemmas Questionnaire. Also females who are high in self-sufficiency and in independence tend to take greater risks than those who score low on these variables. Finally, Wallach and Kogan (1965) summarize the research on the Choice Dilemmas Questionnaire and concluded that this method has adequate validity for assessing risk-taking.

#### Discussion-Without-Consensus Method

The discussion-without-consensus method is a method in which the individual members of the group make their decisions independently after group discussion; group consensus is not required. Subjects

from both the low and high acquaintance sections were randomly assigned to groups of four whose composition was either all male, all female, or mixed-sex. The Choice Dilemmas Questionnaire was administered to the groups, and they were instructed to discuss the first item for five minutes. Then they were stopped and asked to record their decision for that item in light of the group discussion. Each subject recorded his choice independently. The same procedure was continued for all twelve items.

The complete instructions for this method, discussion-without-consensus, were taken from Wallach and Kogan (1965) and were modified for use in this study. These instructions are shown below:

The questionnaire you have in front of you is the same one which you just finished taking. I have had each of you fill out the questionnaire so that you would become familiar with all of the situations it contains. What I am really interested in is having you discuss each of the situations as a group. In your group discussion inform your fellow group members of the odds you had selected individually and your reasons for selecting those odds. You will have five minutes to discuss each situation. I am not going to participate in any of the discussions, but I will be here to answer any procedural questions which may arise. Please start with item one. Go right ahead.

After five minutes the subjects were stopped and told: In light of your group discussion would you indicate individually how you now feel about the situation. That is, mark the odds you personally now feel would be appropriate to take. This procedure was repeated for all 12 items.

The discussion-without-consensus method was employed because the investigator was interested specifically in the individual's risk-taking behavior in the group situation rather than a group product. Therefore, the thrust of this study was to investigate decision making by the same individual, on the same task, alone and in a group situation.



General Procedure

## Sex and Levels of Acquaintance

One purpose of the study was to determine the effects of sex on risk-taking behavior in groups. A second purpose was to determine the effects of levels of acquaintance on risk-taking behavior. The following two research questions related to these purposes were examined:

1. Are there differences in risk-taking among all male, all female, and mixed-sex groups?
2. Are there differences in risk-taking between low acquaintance groups and high acquaintance groups?

All subjects were tested in their 101 Humanities recitation sections. Subjects assigned to low acquaintance groups were tested the first time their respective sections met. Subjects assigned to high acquaintance groups were tested after their recitation sections had met for approximately two and one-half months (mid-September--December 1969).

The Choice Dilemmas Questionnaire was first administered prior to any group assignment or group discussion. All testing was accomplished in a two hour block. The Choice Dilemmas Questionnaire had been numbered beforehand and was randomly distributed to the subjects. The subjects were requested to record their name, age, sex, and class on the Choice Dilemmas in order to facilitate later group assignment. The Questionnaire and initial instructions are Appendix A. Certain other points (taken from Wallach & Kogan, 1965, p. 8) were then emphasized by the experimenter:

There are two points I should like to bring to your attention which may seem clear enough at the outset, but are easily overlooked when you become involved in some of the situations. The first is that alternative X--the riskier alternative--is always assumed to be more desirable than the safer course, if X should be successful. The second point concerns the meaning of the odds you are being asked to mark. The odds you mark indicate the lowest odds you would be willing to take and still advise the central figure to give the risky alternative a try. There is no time limit, so take your time and consider the twelve situations carefully. You may return to one if you wish to change your answer after seeing some of the others.

All subjects completed the Questionnaire within twenty minutes. The subjects were told to remember the number on the top of the Questionnaire. After collecting the questionnaires, the investigator used these numbers to randomly assign the subjects to all male, all female, or mixed-sex groups. The low acquaintance subjects were asked if they had known one another prior to group assignment. If this occurred a switch was made. The high acquaintance subjects were asked if they had known one another prior to their enrollment in Humanities 101. If this occurred a switch was made. In only one situation was a switching of group members required.

The Choice Dilemmas Questionnaire was then redistributed to all the subjects. The discussion-without-consensus method was applied to these group situations. The initial individual data provided the baseline for assessing shifts. The shift was obtained by comparing each subject's individual score with the score he obtained in the group situation. There were 96 subjects ordered into six categories of sixteen subjects each (four groups of four). The six categories were all male low acquaintance, all female low acquaintance, mixed-sex low acquaintance, all male high acquaintance, all female high acquaintance, and mixed-sex high acquaintance.



### Familiarization

The third purpose of this study was to investigate whether or not familiarization with the testing instrument affected risk-taking. The following research question related to this purpose was examined:

3. Does familiarity with the risk-taking instrument, the Choice Dilemmas Questionnaire, affect risk-taking?

To answer this question an additional 48 low acquaintance subjects were used. These 48 subjects were placed into four all male, four all female, and four mixed-sex groups composed of four members each. The same criteria for low acquaintance group membership, as described above, were used. The discussion-without-consensus method was employed.

The instructions for this part of the study were slightly modified from the group instructions shown above. These instructions were taken from Wallach and Kogan (1965) and are shown below:

I am interested in having you discuss each of the situations as a group. In your group discussion each individual should let his fellow group members know what odds he feels are appropriate and why. Do not mark an answer on the questionnaire at this time, however. After reading each item you will have five minutes to discuss it as a group. I am not going to participate in any of the discussions, but I will be here to answer any procedural questions which may arise. Please start with item number one. Go right ahead.

After five minutes the subjects were stopped and told: In light of your group discussion would you indicate individually how you now feel about the situation. That is, mark the odds you personally now feel would be appropriate to take. This procedure was repeated for all twelve items.

The group score made by these low acquaintance subjects should be comparable to the group score made by the low acquaintance subjects

who had initially taken the Questionnaire individually. If this was not the case, familiarization with the instrument would become a qualifying variable in this study.

#### Statistical Treatment

The means for the all male, all female, and mixed-sex groups on risk-taking, and the means for the low and high acquaintance groups on risk-taking were analyzed utilizing a two-way analysis of covariance. F-ratios were calculated by using the regression method (Cohen, 1968). Where significant F-ratios were obtained, Scheffé's test (Ferguson, 1966) was applied to determine the locations of significance.

The mean of the low acquaintance subjects who were familiar with the Choice Dilemmas Questionnaire was compared to the mean of the low acquaintance subjects who were not familiar with this instrument by using an unrelated  $t$  test (Kolstoe, 1969).

The .05 level was established as the criterion for significance for all statistical tests.



## CHAPTER IV

### ANALYSIS OF THE DATA

The analysis and results of this study are presented in the order of the three research questions that were stated in Chapters I and III. These research questions were transformed into null hypotheses for presentation in this chapter.

#### Results for Sex and Levels of Acquaintance

The first and second research questions sought to determine whether or not sex and level of acquaintance affected risk-taking behavior.

##### Null Hypothesis 1

There are no differences in risk-taking among all male, all female, and mixed-sex groups.

##### Null Hypothesis 2

There are no differences in risk-taking between low acquaintance groups and high acquaintance groups.

Table 4 presents the means and standard deviations of the subjects' scores in the individual situation.

TABLE 4

MEANS AND STANDARD DEVIATIONS OF THE SUBJECTS' SCORES IN THE INDIVIDUAL SITUATION FOR MALE, FEMALE, AND MIXED-SEX GROUPS AT THE LOW AND HIGH ACQUAINTANCE LEVELS (N=96)

	Male			Female			Mixed-Sex		
	N	$\bar{X}$	SD	N	$\bar{X}$	SD	N	$\bar{X}$	SD
Low Acq.	16	64.19	13.39	16	69.94	9.38	16	63.25	15.17
High Acq.	16	65.75	8.62	16	70.63	9.76	16	72.81	13.02

Table 5 presents the means and standard deviations of the subjects' scores in the group situation.

TABLE 5

MEANS AND STANDARD DEVIATIONS OF THE SUBJECTS' SCORES IN THE GROUP SITUATION FOR MALE, FEMALE, AND MIXED-SEX GROUPS AT THE LOW AND HIGH ACQUAINTANCE LEVELS (N=96)

	Male			Female			Mixed-Sex		
	N	$\bar{X}$	SD	N	$\bar{X}$	SD	N	$\bar{X}$	SD
Low Acq.	16	63.25	11.28	16	69.00	5.98	16	52.56	11.77
High Acq.	16	65.50	6.24	16	72.88	5.16	16	73.00	11.27

The shift score means are presented in Table 6. These means were adjusted by covariance to control for initial differences among the groups. A constant of 50 was added to avoid negative numbers. Table 6 reveals that the following groups shifted toward risk:



Low Acquaintance Males	(2.84 points)
Low Acquaintance Mixed-Sex	(13.09 points)
High Acquaintance Males	(1.32 points)

The following groups shifted toward caution:

Low Acquaintance Females	(0.22 points)
High Acquaintance Females	(3.78 points)
High Acquaintance Mixed-Sex	(2.88 points)

TABLE 6

SHIFT SCORE MEANS FOR INDIVIDUALS IN MALE, FEMALE, AND MIXED-SEX GROUPS AT THE LOW AND HIGH ACQUAINTANCE LEVELS (N=96)

	Male		Female		Mixed-Sex	
	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$
Low Acq.	16	52.84	16	49.78	16	63.09
High Acq.	16	51.32	16	46.22	16	47.12

Table 7 presents the results of an analysis of covariance applied to the data for sex and levels of acquaintance.

Significant main effects are indicated for both the sex ( $p < .01$ ) and acquaintance ( $p < .001$ ) variables. On the basis of these results, both null hypothesis one and null hypothesis two are rejected. A significant interaction between acquaintance level and sex was also found ( $p < .001$ ). To identify the locations of significance Scheffé's test was utilized. The results of this analysis are reported in Table 8.

TABLE 7

TWO-WAY ANALYSIS OF COVARIANCE OF SHIFT SCORE MEANS FOR INDIVIDUALS  
IN MALE, FEMALE, AND MIXED-SEX GROUPS AT THE LOW AND HIGH  
ACQUAINTANCE LEVELS (N=96)

Source of Variance	df	SS	MS	F
Acquaintance Level (R)	1	1070.14	1070.14	19.12***
Sex (C)	2	758.42	379.21	6.77**
R X C	2	976.71	488.36	8.72***
Within	89	4982.57	55.98	
Total	94	7787.84		

\*\*p < .01

\*\*\*p < .001

The results of the Scheffé's tests show that the low acquaintance mixed-sex group is significantly different from every other group in the study. More specifically, Scheffé's test indicated a difference at the .05 level between the low acquaintance mixed-sex groups and the low acquaintance male groups; a significant difference at the .01 level was found between the low acquaintance mixed-sex groups and the high acquaintance male groups; the .001 level of significance was reached when the low acquaintance mixed-sex groups were compared to the low acquaintance female groups, the high acquaintance female groups, and the high acquaintance mixed-sex groups.



TABLE 8

SCHÉFFÉ TEST COMPARISONS OF SHIFT SCORE MEANS FOR INDIVIDUALS IN THE SIX GROUPS BASED ON THE VARIABLES OF SEX AND ACQUAINTANCE LEVEL (N=96)

Comparison	Mean	Differences Between Means	Scheffé's F
LAM <sup>a</sup> -LAF <sup>b</sup>	52.84-49.78	3.06	1.34
LAM-LA Mixed <sup>c</sup>	52.84-63.09	-10.25	15.01*
LAM-HAM <sup>d</sup>	52.84-51.32	1.52	.33
LAM-HAF <sup>e</sup>	52.84-46.22	6.62	6.26
LAM-HA Mixed <sup>f</sup>	52.84-47.12	5.72	4.67
LAF-LA Mixed	49.78-63.09	-13.31	25.32***
LAF-HAM	49.78-51.32	- 1.54	.34
LAF-HAF	49.78-46.22	3.56	1.81
LAF-HA Mixed	49.78-47.12	2.66	1.01
LA Mixed-HAM	63.09-51.32	11.77	19.78**
LA Mixed-HAF	63.09-46.22	16.87	40.64***
LA Mixed-HA Mixed	63.09-47.12	15.97	36.43***
HAM-HAF	51.32-46.22	5.10	3.71
HAM-HA Mixed	51.32-47.12	4.20	2.52
HAF-HA Mixed	46.22-47.12	- .90	.81

<sup>a</sup>Low Acquaintance Male

\*p < .05 F' = 11.85 with df = 5/89

<sup>b</sup>Low Acquaintance Female

\*\*p < .01 F' = 16.70 with df = 5/89

<sup>c</sup>Low Acquaintance Mixed-Sex

\*\*\*p < .001 F' = 23.80 with df = 5/89

<sup>d</sup>High Acquaintance Male

<sup>e</sup>High Acquaintance Female

<sup>f</sup>High Acquaintance Mixed-Sex

Results for Familiarization

The third research question sought to determine whether or not familiarization with the Choice Dilemmas Questionnaire affected risk-taking.

Null Hypothesis 3

Familiarity with the risk-taking instrument, the Choice Dilemmas Questionnaire, does not affect risk-taking.

Table 9 presents the means, standard deviations, and the t test used to test this hypothesis.

TABLE 9

MEANS, STANDARD DEVIATIONS, AND t TEST FOR FAMILIARIZATION WITH THE CHOICE DILEMMAS QUESTIONNAIRE (N=96)

Situation	N	Mean	SD	<u>t</u>
Group Score after Individual Administration	48	61.60	12.12	.11 (NS)
Group Score with No Prior Testing	48	61.35	9.99	

The results from Table 9 indicate that null hypothesis 3 must be retained. On the basis of this finding, it may be concluded that familiarization with the risk-taking instrument did not affect risk-taking.



## CHAPTER V

### SUMMARY, DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

#### Summary

This study had three purposes. The first purpose was to determine the effect of sex composition on risk-taking behavior in groups. The second purpose was to investigate the influence of acquaintance levels on this same variable. The third purpose was to investigate whether or not familiarization with the risk-taking instrument, the Choice Dilemmas Questionnaire, affected risk-taking.

To achieve these purposes, the following research questions were examined:

1. Are there differences in risk-taking among all male, all female, and mixed-sex groups?
2. Are there differences in risk-taking between low acquaintance groups and high acquaintance groups?
3. Does familiarity with the risk-taking instrument, the Choice Dilemmas Questionnaire, affect risk-taking?

The research population for this investigation numbered approximately 640 freshmen students who were enrolled in Humanities 101 at the University of North Dakota in the fall semester of 1969. A random sample of 144 subjects was drawn from that population. Ninety-six of the 144 subjects were used to investigate the effects of sex and

acquaintance on risk-taking. The remaining 48 subjects were given the Choice Dilemmas in only the group situation. Their scores were compared to the group scores of the low acquaintance subjects who were familiar with the risk-taking instrument in order to assess the effects of familiarization.

The instrument employed to measure risk-taking in this study was the Choice Dilemmas Questionnaire (Appendix A). Two-way analysis of covariance was utilized to test for differences on research questions one and two, and Scheffé's test was applied to determine the locations of significance. An unrelated  $t$  test was utilized to analyze research question three. The findings of this study were as follows:

1. There was a significant difference in risk-taking means among all male, all female, and mixed-sex groups.
2. A significant difference in risk-taking means was found between low and high acquaintance groups.
3. There was a significant difference in risk-taking means as a result of the interaction of the sex composition of the groups and the groups' acquaintance level. Specifically, low acquaintance mixed-sex groups took significantly more risks than low acquaintance male groups, low acquaintance female groups, high acquaintance male groups, high acquaintance female groups, and high acquaintance mixed-sex groups.
4. Familiarity with the Choice Dilemmas Questionnaire did not significantly influence risk-taking.



### Discussion and Conclusions

The first two purposes of this study were to investigate the effects of the sex composition of the groups and the groups' level of acquaintance on risk-taking. Significant differences were found among all male, all female, and mixed-sex groups. A significant difference was also found between the low acquaintance and high acquaintance groups. In addition the present study found a significant interaction effect between sex and acquaintance level on risk-taking.

Research in areas other than risk-taking has found sex differences in a variety of psychological functions (Anastasi, 1958; Kass, 1964; Crandall, 1965; Slovic, 1966). However, no study was located that directly compared the effects of all male, all female, and mixed-sex groups on risk-taking, even though the above-cited research suggested the possibility of finding such sex differences. For example, Kass (1964) and Slovic's (1966) studies indicated that males were more prone toward risk. Wallach et al. (1964) found that females did not exhibit the dramatic shifts toward risk that males did on the Choice Dilemmas. In addition, Kogan and Wallach (1965) suggested that a woman's decision making behavior is more strongly determined by internal disposition than that of a man. A man's decision making behavior, on the other hand, is influenced more by the external situation. This would lead one to expect that women would take fewer risks than men.

The present investigation, in fact, found that women took fewer risks than men (Table 6). The low and high acquaintance male groups shifted toward risk 2.08 points per individual, while the female groups shifted toward caution 2.00 points per individual.

The most interesting finding, however, was that the low and high acquaintance mixed-sex groups shifted 5.11 points toward risk, a difference that was significant at the .01 level (Table 7).

A possible explanation for the significant sex variable is based upon the investigator's clinical observations of the groups' interactions. It was noted that the female groups seemed more verbal but less task oriented than the male groups. They talked a great deal more than the male groups but had a tendency to drift from the items on the Choice Dilemmas Questionnaire to other topics such as boys, hair styles, fashions, etc. The male groups, on the other hand, seemed to stay on the task but were not as verbal as the females; they tended to have periods of silence. In the mixed-sex groups, the tendency of the females to keep the conversation going, and the tendency of the males to stay with the task, may have combined to keep the discussion moving and on the topic. The results were that more information was exchanged about each item and thus, a greater shift toward risk occurred. The thrust of the matter is that the sex composition of the groups affects the amount of shift toward risk made by the group members.

Two studies were reviewed that questioned the appropriateness of generalizing from low acquaintance to high acquaintance groups (Lorge *et al.*, 1958; Hall & Williams, 1966). Only three investigations, using the Choice Dilemmas Questionnaire, considered the influence of acquaintance level on risk-taking. One of these studies (Siegel & Zajonc, 1967) utilized only high acquaintance groups and found a significant shift toward risk. They concluded that low acquaintance groups and high acquaintance groups appeared quite similar. However, Siegel and Zajonc (1967) overgeneralized; they



did not make comparisons between low and high acquaintance groups from the same population to investigate whether or not the two groups were similar.

The two other studies which investigated acquaintance level were conducted by Rabow et al. (1966) and Chandler and Rabow (1969). Rabow et al. (1966) had predicted that high acquaintance groups would be more conservative than low acquaintance groups for two reasons. One reason was that they felt there would be less variance on initial choices for well acquainted groups, therefore, there would not be much reason to discuss the problem. The second reason they proposed was that high acquaintance would reduce shift because of its impact on the group discussion itself. That is, people who know one another are more likely to compromise. Although Rabow et al. (1966) found no significant differences between high and low acquaintance groups, they still conjectured that high acquaintance groups contributed disproportionately to the conservative shift found in the conflict items. Chandler and Rabow (1969) found that high acquaintance groups were more conservative than low acquaintance groups when they compared families with complete strangers.

The present investigation supported the feelings of Rabow et al. (1966) and the findings of Chandler and Rabow (1969). The results reported in Table 6 show that the average individual shift toward risk was 5.24 points for the low acquaintance groups. For the high acquaintance groups the average individual shift was 1.78, but this time the shift was toward caution. The difference between these two groups was significant at the .001 level (Table 7).

The reasons mentioned by Rabow et al. (1966) to explain the greater conservatism of high acquaintance groups appear to be well founded. In addition, the present study included a unique variable that may have affected the results; it used only freshmen. Low acquaintance subjects might have diligently stayed with the task since the Choice Dilemmas was administered during their first class meeting. High acquaintance subjects, less naive and awed by class assignments, may have diverted their attention from the Choice Dilemmas to other topics. The result was a shift toward caution in the high acquaintance groups perhaps because these subjects did not discuss the Choice Dilemmas as fully as the low acquaintance subjects. Whatever the reason, the results indicated that making generalizations from the behavior of low acquaintance groups to high acquaintance groups is inappropriate.

The significant interaction ( $p < .001$ ) of sex and acquaintance level indicated that these two variables combined affected risk-taking (Table 7). The greatest shift toward risk was exhibited by the individuals in the low acquaintance mixed-sex groups; they shifted 13.09 points. The other individual average shifts toward risk were 2.84 points for the low acquaintance male groups and 1.32 points for the high acquaintance male groups. The following three groups shifted toward caution: the low acquaintance female groups shifted .22 points per individual, the high acquaintance females shifted 3.78 points per individual, and the high acquaintance mixed-sex groups shifted 2.88 points per individual (Table 6).



An interesting pattern was observed when the Scheffé's tests were computed. Five significant comparisons were found (Table 8): low acquaintance males, low acquaintance females, high acquaintance males, high acquaintance females, and high acquaintance mixed-sex were significantly different from low acquaintance mixed-sex. No other comparisons were significant. The results clearly indicate that the low acquaintance mixed-sex groups contributed substantially to the sex by acquaintance interaction. Moreover, the results suggest that sex and acquaintance level should be considered together when investigating risk-taking behavior in groups.

The third purpose of this study was to investigate whether or not familiarization with the Choice Dilemmas affected risk-taking. Past research had indicated that familiarization with the Choice Dilemmas Questionnaire might be a contributing factor to account for the risky-shift phenomenon (Bateson, 1966; Flanders & Thistlethwaite, 1967; Marquis, 1968; Wallach & Wing, 1968). Familiarization was found not to influence risk-taking behavior (Table 9). Had familiarization been found to contribute significantly to risk-taking it would have become a qualifying variable for almost all prior research that utilized the Choice Dilemmas Questionnaire to investigate risk-taking behavior in groups. Such, however, was not the case.

#### Recommendations

Based on the results of this study the following recommendations are made:

1. Replications of this study are recommended using several different research populations such as military personnel, business executives, and academic department members.

2. A longitudinal study is recommended to examine the effects of level of acquaintance on risk-taking.

3. An investigation into the effects of group size on risk-taking among all male, all female, and mixed-sex groups and between low and high acquaintance groups is recommended.

4. Studies are recommended of risk-taking among all male, all female, and mixed-sex groups and between low and high acquaintance groups that are classified according to various personality types.

5. Instruments, other than the Choice Dilemmas Questionnaire, should be examined and identified for use as indicators of risk-taking.



APPENDIX A

## OPINION QUESTIONNAIRE II

INSTRUCTIONS: On the following pages, you will find a series of situations that are likely to occur in everyday life. The central person in each situation is faced with a choice between two alternative courses of action, which we might call X and Y. Alternative X is more desirable and attractive than alternative Y, but the probability of attaining or achieving X is less than that of attaining or achieving Y.

For each situation on the following pages, you will be asked to indicate the minimum odds of success you would demand before recommending that the more attractive or desirable X be chosen.

Read each situation carefully before giving your judgment. Try to place yourself in the position of the central person in each of the situations. There are twelve situations in all. Please do not omit any of them.



1. Mr. A, an electrical engineer, who is married and has one child, has been working for a large electronics corporation since graduating from college five years ago. He is assured of a lifetime job with a modest, though adequate salary, and liberal pension benefits upon retirement. On the other hand, it is very unlikely that his salary will increase much before he retires. While attending a convention, Mr. A is offered a job with a small, newly founded company which has a highly uncertain future. The new job would pay more to start and would offer the possibility of a share in the ownership if the company survived the competition of the larger firms.

Imagine that you are advising Mr. A. Listed below are several probabilities or odds of the new company's proving financially sound.

PLEASE CHECK THE lowest PROBABILITY THAT YOU WOULD CONSIDER ACCEPTABLE TO MAKE IT WORTHWHILE FOR MR. A TO TAKE THE NEW JOB.

The chances are 1 in 10 that the company will prove financially sound.

The chances are 3 in 10 that the company will prove financially sound.

The chances are 5 in 10 that the company will prove financially sound.

The chances are 7 in 10 that the company will prove financially sound.

The chances are 9 in 10 that the company will prove financially sound.

Place a check here if you think Mr. A should not take the new job no matter what the probabilities.

2. Mr. B, a 45-year-old accountant, has recently been informed by his physician that he has developed a severe heart ailment. The disease would be sufficiently serious to force Mr. B to change many of his strongest life habits--reducing his work load, drastically changing his diet, giving up favorite leisure-time pursuits. The physician suggests that a delicate medical operation could be attempted which, if successful, would completely relieve the heart condition. But its success could not be assured, and in fact, the operation might prove fatal.

Imagine that you are advising Mr. B. Listed below are several probabilities or odds that the operation will prove successful.

PLEASE CHECK THE lowest PROBABILITY THAT YOU WOULD CONSIDER ACCEPTABLE FOR THE OPERATION TO BE PERFORMED.

Place a check here if you think Mr. B should not have the operation no matter what the probabilities.

The chances are 9 in 10 that the operation will be a success.

The chances are 7 in 10 that the operation will be a success.

The chances are 5 in 10 that the operation will be a success.

The chances are 3 in 10 that the operation will be a success.

The chances are 1 in 10 that the operation will be a success.



3. Mr. C, a married man with two children, has a steady job that pays him about \$6000 per year. He can easily afford the necessities of life, but few of the luxuries. Mr. C's father, who died recently, carried a \$4000 life insurance policy. Mr. C would like to invest this money in stocks. He is well aware of the secure "blue-chip" stocks and bonds that would pay approximately 6% on his investment. On the other hand, Mr. C has heard that the stocks of a relatively unknown Company X might double their present value if a new product currently in production is favorably received by the buying public. However, if the product is unfavorably received, the stocks would decline in value.

Imagine that you are advising Mr. C. Listed below are several probabilities or odds that Company X stocks will double their value.

PLEASE CHECK THE lowest PROBABILITY THAT YOU WOULD CONSIDER ACCEPTABLE FOR MR. C TO INVEST IN COMPANY X STOCKS.

The chances are 1 in 10 that the stocks will double their value.

The chances are 3 in 10 that the stocks will double their value.

The chances are 5 in 10 that the stocks will double their value.

The chances are 7 in 10 that the stocks will double their value.

The chances are 9 in 10 that the stocks will double their value.

Place a check here if you think Mr. C should not invest in Company X stocks, no matter what the probabilities.

4. Mr. D is the captain of College X's football team. College X is playing its traditional rival, College Y, in the final game of the season. The game is in its final seconds, and Mr. D's team, College X, is behind in the score. College X has time to run one more play. Mr. D, the captain, must decide whether it would be best to settle for a tie score with a play which would be almost certain to work, or on the other hand, should he try a more complicated and risky play which could bring victory if it succeeded, but defeat if not.

Imagine that you are advising Mr. D. Listed below are several probabilities or odds that the risky play will work.

PLEASE CHECK THE lowest PROBABILITY THAT YOU WOULD CONSIDER ACCEPTABLE FOR THE RISKY PLAY TO BE ATTEMPTED.

\_\_\_\_\_ Place a check here if you think Mr. D should not attempt the risky play no matter what the probabilities.

\_\_\_\_\_ The chances are 9 in 10 that the risky play will work.

\_\_\_\_\_ The chances are 7 in 10 that the risky play will work.

\_\_\_\_\_ The chances are 5 in 10 that the risky play will work.

\_\_\_\_\_ The chances are 3 in 10 that the risky play will work.

\_\_\_\_\_ The chances are 1 in 10 that the risky play will work.



5. Mr. E is president of a light metals corporation in the United States. The corporation is quite prosperous, and has strongly considered the possibilities of business expansion by building an additional plant in a new location. The choice is between building another plant in the U.S., where there would be a moderate return on the initial investment, or building a plant in a foreign country. Lower labor costs and easy access to raw materials in that country would mean a much higher return on the initial investment. On the other hand, there is a history of political instability and revolution in the foreign country under consideration. In fact, the leader of a small minority party is committed to nationalizing, that is, taking over, all foreign investments.

Imagine that you are advising Mr. E. Listed below are several probabilities or odds of continued political stability in the foreign country under consideration.

PLEASE CHECK THE lowest PROBABILITY THAT YOU WOULD CONSIDER ACCEPTABLE FOR MR. E'S CORPORATION TO BUILD A PLANT IN THAT COUNTRY.

The chances are 1 in 10 that the foreign country will remain politically stable.

The chances are 3 in 10 that the foreign country will remain politically stable.

The chances are 5 in 10 that the foreign country will remain politically stable.

The chances are 7 in 10 that the foreign country will remain politically stable.

The chances are 9 in 10 that the foreign country will remain politically stable.

Place a check here if you think Mr. E's corporation should not build a plant in the foreign country, no matter what the probabilities.

6. Mr. F is currently a college senior who is very eager to pursue graduate study in chemistry leading to the Doctor of Philosophy degree. He has been accepted by both University X and University Y. University X has a world-wide reputation for excellence in chemistry. While a degree from University X would signify outstanding training in this field, the standards are so very rigorous that only a fraction of the degree candidates actually receive the degree. University Y, on the other hand, has much less of a reputation in chemistry, but almost everyone admitted is awarded the Doctor of Philosophy degree, though the degree has much less prestige than the corresponding degree from University X.

Imagine that you are advising Mr. F. Listed below are several probabilities or odds that Mr. F would be awarded a degree at University X, the one with the greater prestige.

PLEASE CHECK THE lowest PROBABILITY THAT YOU WOULD CONSIDER ACCEPTABLE TO MAKE IT WORTHWHILE FOR MR. F TO ENROLL IN UNIVERSITY X RATHER THAN UNIVERSITY Y.

\_\_\_\_\_ Place a check here if you think Mr. F should not enroll in University X, no matter what the probabilities.

\_\_\_\_\_ The chances are 9 in 10 that Mr. F would receive a degree from University X.

\_\_\_\_\_ The chances are 7 in 10 that Mr. F would receive a degree from University X.

\_\_\_\_\_ The chances are 5 in 10 that Mr. F would receive a degree from University X.

\_\_\_\_\_ The chances are 3 in 10 that Mr. F would receive a degree from University X.

\_\_\_\_\_ The chances are 1 in 10 that Mr. F would receive a degree from University X.



7. Mr. G, a competent chess player, is participating in a national chess tournament. In an early match he draws the top-favored player in the tournament as his opponent. Mr. G has been given a relatively low ranking in view of his performance in previous tournaments. During the course of his play with the top-favored man, Mr. G notes the possibility of a deceptive though risky maneuver which might bring him a quick victory. At the same time, if the attempted maneuver should fail, Mr. G would be left in an exposed position and defeat would almost certainly follow.

Imagine that you are advising Mr. G. Listed below are several probabilities or odds that Mr. G's deceptive play would succeed.

PLEASE CHECK THE lowest PROBABILITY THAT YOU WOULD CONSIDER ACCEPTABLE FOR THE RISKY PLAY IN QUESTION TO BE ATTEMPTED.

\_\_\_\_\_ The chances are 1 in 10 that the play would succeed.

\_\_\_\_\_ The chances are 3 in 10 that the play would succeed.

\_\_\_\_\_ The chances are 5 in 10 that the play would succeed.

\_\_\_\_\_ The chances are 7 in 10 that the play would succeed.

\_\_\_\_\_ The chances are 9 in 10 that the play would succeed.

\_\_\_\_\_ Check here if you think Mr. G should not attempt the risky play, no matter what the probabilities.

8. Mr. H, a college senior, has studied the piano since childhood. He has won amateur prizes and given small recitals, suggesting that Mr. H has considerable musical talent. As graduation approaches, Mr. H has the choice of going to medical school to become a physician, a profession which would bring certain prestige and financial rewards; or entering a conservatory of music for advanced training with a well-known pianist. Mr. H realizes that even upon completion of his piano studies, which would take many more years and a lot of money, success as a concert pianist would not be assured.

Imagine that you are advising Mr. H. Listed below are several probabilities or odds that Mr. H would succeed as a concert pianist.

PLEASE CHECK THE lowest PROBABILITY THAT YOU WOULD CONSIDER ACCEPTABLE FOR MR. H TO CONTINUE WITH HIS MUSICAL TRAINING.

Place a check here if you think Mr. H should not pursue his musical training, no matter what the probabilities.

The chances are 9 in 10 that Mr. H would succeed as a concert pianist.

The chances are 7 in 10 that Mr. H would succeed as a concert pianist.

The chances are 5 in 10 that Mr. H would succeed as a concert pianist.

The chances are 3 in 10 that Mr. H would succeed as a concert pianist.

The chances are 1 in 10 that Mr. H would succeed as a concert pianist.



9. Mr. J is an American captured by the enemy in World War II and placed in a prisoner-of-war camp. Conditions in the camp are quite bad, with long hours of hard physical labor and a barely sufficient diet. After spending several months in this camp, Mr. J notes the possibility of escape by concealing himself in a supply truck that shuttles in and out of the camp. Of course, there is no guarantee that the escape would prove successful. Recapture by the enemy could well mean execution.

Imagine that you are advising Mr. J. Listed below are several probabilities or odds of a successful escape from the prisoner-of-war camp.

PLEASE CHECK THE lowest PROBABILITY THAT YOU WOULD CONSIDER ACCEPTABLE FOR AN ESCAPE TO BE ATTEMPTED.

The chances are 1 in 10 that the escape would succeed.

The chances are 3 in 10 that the escape would succeed.

The chances are 5 in 10 that the escape would succeed.

The chances are 7 in 10 that the escape would succeed.

The chances are 9 in 10 that the escape would succeed.

Place a check here if you think Mr. J should not try to escape no matter what the probabilities.

10. Mr. K is a successful businessman who has participated in a number of civic activities of considerable value to the community. Mr. K has been approached by the leaders of his political party as a possible congressional candidate in the next election. Mr. K's party is a minority party in the district, though the party has won occasional elections in the past. Mr. K would like to hold political office, but to do so would involve a serious financial sacrifice, since the party has insufficient campaign funds. He would also have to endure the attacks of his political opponents in a hot campaign.

Imagine that you are advising Mr. K. Listed below are several probabilities or odds of Mr. K's winning the election in his district.

PLEASE CHECK THE lowest PROBABILITY THAT YOU WOULD CONSIDER ACCEPTABLE TO MAKE IT WORTHWHILE FOR MR. K TO RUN FOR POLITICAL OFFICE.

Place a check here if you think Mr. K should not run for political office no matter what the probabilities.

The chances are 9 in 10 that Mr. K would win the election.

The chances are 7 in 10 that Mr. K would win the election.

The chances are 5 in 10 that Mr. K would win the election.

The chances are 3 in 10 that Mr. K would win the election.

The chances are 1 in 10 that Mr. K would win the election.



11. Mr. L, a married 30-year-old research physicist, has been given a five-year appointment by a major university laboratory. As he contemplates the next five years, he realizes that he might work on a difficult, long-term problem which, if a solution could be found, would resolve basic scientific issues in the field and bring high scientific honors. If no solution were found, however, Mr. L would have little to show for his five years in the laboratory, and this would make it hard for him to get a good job afterwards. On the other hand, he could, as most of his professional associates are doing, work on a series of short-term problems where solutions would be easier to find, but where the problems are of lesser scientific importance.

Imagine that you are advising Mr. L. Listed below are several probabilities or odds that a solution would be found to the difficult long-term problem that Mr. L has in mind.

PLEASE CHECK THE lowest PROBABILITY THAT YOU WOULD CONSIDER ACCEPTABLE TO MAKE IT WORTHWHILE FOR MR. L TO WORK ON THE MORE DIFFICULT LONG-TERM PROBLEM.

The chances are 1 in 10 that Mr. L would solve the long-term problem.

The chances are 3 in 10 that Mr. L would solve the long-term problem.

The chances are 5 in 10 that Mr. L would solve the long-term problem.

The chances are 7 in 10 that Mr. L would solve the long-term problem.

The chances are 9 in 10 that Mr. L would solve the long-term problem.

Place a check here if you think Mr. L should not choose the long-term, difficult problem, no matter what the probabilities.

12. Mr. M is contemplating marriage to Miss T, a girl whom he has known for a little more than a year. Recently, however, a number of arguments have occurred between them, suggesting some sharp differences of opinion in the way each views certain matters. Indeed, they decide to seek professional advice from a marriage counselor as to whether it would be wise for them to marry. On the basis of these meetings with a marriage counselor, they realize that a happy marriage, while possible, would not be assured.

Imagine that you are advising Mr. M and Miss T. Listed below are several probabilities or odds that their marriage would prove to be a happy and successful one.

PLEASE CHECK THE lowest PROBABILITY THAT YOU WOULD CONSIDER ACCEPTABLE FOR MR. M AND MISS T TO GET MARRIED.

\_\_\_\_\_ Place a check here if you think Mr. M and Miss T should not marry, no matter what the probability.

\_\_\_\_\_ The chances are 9 in 10 that the marriage would be happy and successful.

\_\_\_\_\_ The chances are 7 in 10 that the marriage would be happy and successful.

\_\_\_\_\_ The chances are 5 in 10 that the marriage would be happy and successful.

\_\_\_\_\_ The chances are 3 in 10 that the marriage would be happy and successful.

\_\_\_\_\_ The chances are 1 in 10 that the marriage would be happy and successful.



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