PUBLICITY OF INITIAL DECISIONS AND THE RISKY-SHIFT
PHENOMENON

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INTRODUCTION

Recent research on group processes has placed considerable emphasis on decision making involving risk. While there has been a great deal of speculation and research on individual risk taking, the area of risk taking by groups has been, until recently, relatively neglected.

Studies of individual risk taking have dealt with such things as the subject's perception of the relative contribution of luck and skill to the outcome of the decision (e.g. Strickland, Lewicki, & Katze 1966); the amount of predecisional information-seeking activity and the determinants of the amount of information sought (e.g. Irwin & Smith 1956, 1957); comparisons of the effect of real versus imaginary incentives (e.g. Edwards 1953); the effects of gains and losses from prior decisions (e.g. Edwards 1962); sex and age differences (Wallach & Kogan 1959, 1961); personality and motivational correlates (e.g. Atkinson, Bastion, Earl & Litwin 1960); cognitive judgmental aspects of risk taking (e.g. Kogan & Wallach 1960). This work is of considerable significance in the study of risk taking behaviour, but if research is restricted to risk taking by individuals per se, an important area of

the psychology of the making of decisions is excluded. Many decisions are made in active consultation with others, so that a final decision may be made by a group or by an individual after discussion with others. Thus group risk taking and the influence of a group on individual risk taking is of considerable importance.

What relationship might be expected between the mean of the decisions made by individuals prior to a group discussion, and a group decision made after discussion? There are three possible relationships. The group decision may represent the mean of the individual decisions, the group decision may be more cautious than the mean, or it may be more risky than the mean. Kogan & Wallach (1967) have discussed findings in experimental social psychology and also lay conceptions that give some indirect support to each of these three possibilities. This state of affairs emphasises the need for research on group risk taking.

Three relatively early studies, Hunt & Rowe (1960), Lonergan & McClintock (1961) and Atthowe (1961), which were specifically concerned with the comparison of risk taking by individuals and groups, failed to offer a resolution of the problem. In the Hunt & Rowe experiment, individual decisions concerning hypothetical investments were compared with those made by three person groups

engaged in discussion to consensus. Lonergan & McClintock compared individual decisions in a gambling situation with those of three person groups, while Atthowe compared the decisions of individuals and two person groups where the task was to choose the better of two alternative wagers that were presented in the form of mathematical reasoning problems. The results of these three studies showed an averaging effect, a nonsignificant trend to greater risk taking and more conservative decisions respectively. Thus taken collectively, the studies did not favour any one of the three possible relationships between individual and group risk taking. However, apparent deficiencies in these studies did suggest two considerations which Kogan & Wallach (1967) have suggested are important for experimentation in this area "if it is to offer the possibility of modeling the type of social reality that is of interest to us." (Kogan & Wallach 1967). First, they suggest that the issue of risk taking should be a prominent and involving one for the subjects. Second, the group situation should be of such a nature that some confidence can be felt of its power to capture the essentials of what transpires in the give-and-take of open, intensive discussion.

An experimental paradigm has been developed which appears to meet these requirements. In 1959 Wallach & Kogan developed what they have called a "dilemmas-of-

choice" questionnaire for the purpose of investigating individual differences in risk taking. In this instrument there are twelve hypothetical situations in which a central person is faced with a choice between two alternative courses of action. One of these courses entails a greater risk of failure but is also more rewarding if successful. Thus, one of the dilemmas considers a man of moderate income who may invest some money he inherited in secure low - return securities, or in more risky securities which offer the possibility of large gains. For each situation, the experimental subject is instructed to indicate the minimum likelihood of success for the more risky alternative which he would require before recommending that it be chosen. The subject is required to make his choice from odds of 1 in 10, 3 in 10, 5 in 10, 7 in 10 and 9 in 10 for the success of the risky alternative. The subject also has the option of refusing to recommend choice of the risky alternative no matter how high its chances of success.* The items were designed to reflect a variety of life-like situations with intrinsic risk taking properties. Evidence concerning the reliability and validity of the instrument were presented by Kogan & Wallach (1964).

*For the complete set of dilemmas and the response scale, refer to Appendix One.

If subjects, following the making of individual decisions for the choice dilemmas, are brought together in groups of four, five or six for example, and asked to reach through discussion, a unanimous group decision (typically referred to as discussion to consensus in the literature) for each dilemma, information will be obtained concerning the relation of risk taking by individuals and groups.

In view of the earlier lack of research on group risk taking and the difficulty of predicting the relationship between individual and group risk taking with any confidence on the basis of existing research, recent studies which have used the above paradigm are of considerable interest.

Wallach, Kogan & Bem (1962) have defined the risk taking with which these studies have been concerned as "the extent to which the decision maker is willing to expose himself to possible failure in the pursuit of a desirable goal." An impressive number of these studies have reported that a unanimous group decision which is attained after discussion, is more risky than the average of the individual members' decisions made prior to the discussion. This move to a more risky decision as a result of group discussion has become known as the risky-

shift.

The term "risky-shift" has also been used to refer to a change in individual decisions following group discussion. Thus not only has group discussion resulted in a group decision more risky than the mean of pre-discussion individual decisions but further individual decisions following the group interaction have also been shown to be more risky than the prior individual decisions. It is this individual to individual rather than the individual to group comparison with which the study to be presented was concerned.

The series of studies identifying the risky-shift phenomenon began with Stoner's (1961) finding that discussion to consensus by groups of six subjects, following the making of individual decisions for the above twelve dilemmas, resulted in decisions more risky than the average of the prediscussion individual decisions. In addition, further individual decisions following the group discussions were also more risky than the earlier individual decisions. Many studies have generalised Stoner's findings for various subject populations, different stimulus materials and to a number of decision conditions.

Having established considerable evidence for the generality of the risky-shift phenomenon, interest focused on

the search for mechanisms responsible for this shift. What factor or factors present in the group discussion causes this risky-shift? A number of mechanisms have been proposed and studies have been carried out to investigate the extent to which these mechanisms can explain the risky-shift. It is with possible faults in a number of these experiments that the study to be presented in this thesis is concerned. One major fault in previous studies, this writer suggests, is the failure to control for the publicity of initial decisions which always occurs in the discussion groups but which has not occurred in other conditions which have been introduced to investigate mechanisms proposed as explanations of the risky-shift. Since the risky-shifts of these conditions have been compared with that of the discussion condition, in order to assess their contribution to the discussion-induced shift, it would appear that this variable should be controlled as the degree of publicity of initial decisions in itself, may effect the magnitude of the risky-shift. Thus an investigation of the importance of this variable for the magnitude of the risky-shift was the major purpose of this study.

The remainder of this research report takes the following form. In chapter one, studies that have been

specifically concerned with individual and group risk taking and those that have investigated mechanisms which may produce the risky-shift will be reviewed. The rationale for this study, and hypotheses to be tested will constitute the second chapter, while chapter three describes the experimental design and procedure. The following chapter presents the results and the next, a discussion of these results. The conclusions and implications for future research are drawn in chapter five and a summary of the study is presented in the final chapter. The research report concludes with a bibliography and appendices which contain the choice dilemmas questionnaire and response scale, the confidence scale and influence measure, the standardised instructions, norms for initial decisions and risky-shifts for each problem, and finally, a diagram of the experimental setting.

CHAPTER ONE

A Literature Review of the Risky-Shift^{*}

The risky-shift was first reported by Stoner (1961) in a thesis submitted to the School of Industrial Management at M.I.T. Graduate students of industrial management made individual decisions for the twelve choice dilemma problems and then groups of six were asked to reach, through discussion, a unanimous decision for each problem. Twenty-three other subjects did not meet in groups but studied the problems a second time after a lapse of a few weeks. ⁺ Stoner found that group decisions were more risky than the average of the pre-discussion individual decisions, while the control subjects showed no systematic shift in either direction. Stoner called this acceptance of a lower probability of success as a result of group discussion to consensus, the risky-shift.

A. The Generality of the Risky-Shift

Stoner's finding of a risky-shift is not an isolated result. It has been generalised to various subject groups,

* The literature review will be presented in conjunction with Table 1 which presents the details of the major studies to be considered, and Table 2 which summarises the literature review and enables the progression of studies in each section to be followed.

⁺ Brown (1965) when reporting this unpublished study does not say how many weeks.

TABLE ONE

A Summary Table of the Details of the Major Studies Considered in the Literature Review

<u>STUDY</u>	<u>SUBJECTS</u>	<u>INDEPENDENT VARIABLE</u>	<u>DEPENDENT VARIABLE</u>	<u>RESULTS</u>	<u>STAT. SIGN.</u>
Bateson 1966.	90 male, 19 female students.	C. gr. - irrelevant task. Exper. gr. 1 - familiarisation " gr. 2 - discussion to consensus.	Change from initial to post-manipulation decisions for five choice-dilemmas problems.	C. gr. - no change. Exper. gr. 1 - risky-shift. " gr. 2 - " " " " 1 shift > exper. gr. 2 shift.	p < .001 p < .01 N.S.
Bem, Wallach & Kogan 1965.	126 male students.	C. gr. - repeat decisions after one week. Exper. gr. 1 - discussion to consensus. Exper. gr. 2 - anticipated public disclosure. Exper. gr. 3 - anticipated presence of others. Exper. gr. 4 - anticipated discussion to consensus.	Change from a) initial to consensus decisions or b) initial to post-manipulation decisions for aversive consequences problems.	Exper. gr. 1 - risky-shift, a) initial to consensus decisions. b) initial to post-consensus decisions. Exper. gr. 2 - shift to caution Exper. gr. 3 - " " " Exper. gr. 4 - " " " C. gr. - no systematic shift.	p < .02 p < .02 p < .05 p < .025
Flinders & Thistlethwaite 1967.	180 male students.	C. gr. - repeat decisions. Exper. gr. 1 - familiarisation without discussion. Exper. gr. 2 - discussion to consensus without familiarisation. Exper. gr. 3 - familiarisation and discussion to consensus.	1) Change from initial to post manipulation decisions for the choice dilemmas. 2) Initial decisions. 3) Rankings of influence in discussion.	C. gr. - no shift. Exper. gr. 1 - risky-shift. " gr. 2 - " " " gr. 3 - " " More risk, more influence.	p < .001 p < .001 p < .001 Unknown
Jamieson 1968.	7 males, 15 females Heterogeneous.	Exper. gr. 1 - discussion to consensus. Exper. gr. 2 - familiarisation.	Change from initial to post-manipulation decisions for the choice dilemmas.	Exper. gr. 1 - risky-shift. " gr. 2 - cautious shift.	p < .01 N.S.
Kogan & Wallach 1967.	96 male students.	Exper. gr. 1 - discussion to consensus over intercom. Exper. gr. 2 - discussion without consensus over intercom.	1) Change in decisions on choice dilemmas from a) initial to consensus decisions b) initial to post discussion decisions c) consensus to post discussion decisions. 2) Judgements of either a risky, a cautious or no shift.	Exper. gr. 1 - a) risky-shift, initial to consensus decision. b) risky-shift, initial to post discussion decisions. c) cautious shift, consensus to post discussion decisions. Exper. gr. 2 - risky-shift, initial post discussions decisions. Both groups recognised risky-shift. No difference between the two.	p < .001 p < .001 N.S. p < .01
Kogan & Wallach 1967.	180 female students.	Discussion to consensus for the following groups, exper. gr. 1 - low anxiety, low defensiveness; exper. gr. 2 - low anxiety, high defensiveness; exper. gr. 3 - low defensiveness, high anxiety; exper. gr. 4 - high defensiveness, high anxiety.	1) Change in decisions on choice dilemmas from a) initial to consensus decisions b) initial to post-consensus decisions. 2) Rankings of influence.	Exper. gr. 1 - a) risky shift, initial to consensus. Similarly for exper. gr. 4 and 3 Exper. gr. 2 - risky-shift. All groups - risky-shift, initial to post consensus decisions. Test anxiety enhanced shift. Defensiveness depressed shift.	p < .001 N.S. p < .06 p < .09
Kogan & Wallach 1967.	180 female students.	Exper. gr. 1 - discussion without consensus. Exper. gr. 2 - listen to tape recording of above.	Change in decisions on choice dilemmas from initial to final decisions.	Exper. gr. 1 - risky-shift. " gr. 2 - " " " " 1 shift > exper. gr. 2	p < .001 p < .01 p < .01
Lamm 1967.	78 male students.	Exper. gr. 1 - a) discussion to consensus for 6 choice dilemmas. b) discussion without consensus for 6 choice dilemmas. Exper. gr. 2 - views discussion. Exper. gr. 3 - listens to discussion.	Change in decisions on choice dilemmas from a) initial to consensus decisions, b) initial to final decisions.	Exper. gr. 1 - a) initial to consensus, risky-shift. b) initial to final decision, risky-shift. Exper. gr. 2 - initial to final decision, risky-shift. Exper. gr. 3 - initial to final decision, risky-shift. Exper. gr. 4 & 2 - no systematic differences. Exper. gr. 1 shift > exper. gr. 3 Exper. gr. 2 shift > " " " N.S.	p < .001 p < .05 p < .01 p < .06 N.S.
Marousis 1967.	Middle-level managers.	Exper. gr. - discussion to consensus.	1) Change from initial to consensus decisions on choice dilemmas. 2) Initial decisions. 3) Measures of influence in discussion.	Exper. gr. - risky-shift. More influential, more risky.	Unknown "

Pruitt & Teger 1967.	Male and Female students.	<u>Experiment One</u> Exper. gr. - discussion without consensus. C. gr.-repeat decisions.	Change from initial to final decisions on 6 gambling questions.	Exper. gr. risky-shift > C. gr.	p < .05
	7 male, 16 female students.	<u>Experiments 2, 3, 4, and 5.</u> Exper. gr. - familiarisation with 5 choice dilemmas.	Change from initial to final decisions.	No systematic shift.	
	16 male, 6 female students.	Exper. gr. - exact replication of Bateson's familiarisation.	As above.	Trend toward increased risk.	N.S.
	Unknown.	Exper. gr. 1 - exact replication of Flanders et al familiarisation. Exper. gr. 2 - familiarisation plus a filler scale.	As above.	Exper. gr. 1 - risky-shift. Exper. gr. 2 - shift to caution Exper. gr. 1 risky-shift > exper. gr. 2.	N.S. N.S. N.S.
	37 female students.	Exper. gr. 1 - familiarisation with choice dilemmas, E expects risky-shift. Exper. gr. 2 - familiarisation, E expects cautious shift.	As above.	Exper. gr. 1 & 2 - cautious shift. Exper. gr. 1 shift > exper. gr. 2	N.S. N.S.
	Unknown.	<u>Experiment Six</u> Exper. gr. - discussion to consensus.	1) Change in decisions on choice dilemmas from initial to consensus decisions. 2) Initial decisions. 3) Estimates of initial decisions of 100 other students.	Exper. gr. - risky-shift. Others seen as more cautious than self.	p < .001 p < .07
	Unknown.	<u>Experiment Seven</u> Exper. gr. - initial decisions made with expectation of defending these. C. gr. - initial decisions made as usual.	Initial decisions on choice dilemmas.	No systematic difference between the two conditions.	
	24 female students.	<u>Experiment Eight</u> Exper. gr. - discussion of filler items, final gambling decisions to be averaged.	Change from initial to final decisions on gambling items.	Trend to greater caution.	N.S.
Rabow et al 1966.	128 students.	Exper. gr. - discussion to consensus of a) 3 choice dilemma problems (control items). b) 2 personalized choice dilemmas (commitment items). c) 2 items with increased normative support for caution (norm conflict items).	1) Change from initial to consensus decisions. 2) Initial decisions. 3) Rankings of perceived influence.	Control items - risky-shift. Commitment items - no shift. Conflict items - cautious shift. Correlations of initial risk & influence a) control items, positive relation. b) commitment items, positive relation. c) norm conflict items, negative relation.	p < .05 p < .05 p < .05 p < .05 p < .05
Siegel & Zajonc 1967.	11 psychiatrists, 11 psychologists, 11 social workers.	Exper. gr. - discussion to consensus.	Change from initial to consensus decisions on 6 choice dilemmas and 6 clinical dilemmas.	Exper. gr. - risky-shift.	p < .05
Stoner 1961.	Male students of industrial management.	Exper. gr. - discussion to consensus. C. gr.-repeat decisions.	1) Change in decisions on choice dilemmas from a) initial to consensus decisions. b) initial to final decisions. 2) Initial decisions. 3) Participation in discussion.	Exper. gr. - risky-shift, initial to consensus and initial to final decisions. C. gr. - no systematic shift. No correlation between participation and initial risk.	Unknown
Teger & Pruitt 1967.	165 male students.	Exper. gr. 1 - discussion to consensus, groups of 3, 4 or 5. Exper. gr. 2 - three rounds of balloting (restricted information). Control group - repeat decisions.	1) Change from initial to consensus or second decisions for choice dilemmas. 2) Initial decisions.	Exper. gr. 1 - 4 & 5 man groups shifted to risk. 3 man group - risky-shift. Exper. gr. 2 - risky-shift. Exper. gr. 1 shift > exper. gr. 2 Initially riskier items, greater risky-shift.	p < .01 N.S. p < .05 p < .01
Wallach & Kogen 1965.	180 male, 180 female students.	Exper. gr. 1 - discussion to consensus. Exper. gr. 2 - discussion without consensus. Exper. gr. 3 - consensus without discussion (restricted information).	Change in decisions on choice dilemmas from a) initial to consensus decisions. b) initial to final decisions. c) consensus to final decisions.	Exper. gr. 1 - a) risky-shift. b) " " c) cautious shift Exper. gr. 2 - risky-shift, individual to post discussion decisions. Exper. gr. 3 - no systematic shift. Exper. gr. 1 shift - exper. gr. 3 a) initial to consensus b) initial to post discussion Exper. gr. 2 shift - exper. gr. 3 Exper. gr. 1 and exper. gr. 2 - no difference	+M.p < .005 +F.p < .005 M.p < .01 F.p < .005 M. N.S. F.p < .001 M.p < .001 F.p < .001 M.p < .01 F.p < .01 M.p < .05 F.p < .05 M.p < .01 F.p < .01

Wallech, Kogan & Bem 1962.	107 male, 111 female students.	Exper. gr. - discussion to consensus. For 22 subjects, repeat decisions after 2 - 6 weeks. C. gr. - repeat decisions after 1 week.	1) Change in decisions on choice dilemmas from a) initial to consensus decisions, b) initial to post consensus decisions, c) post consensus to repeat decisions (exper. gr.), d) initial to repeat decisions (C. group). 2) Initial decisions. 3) Rankings of influence.	Exper. gr.-a) risky-shift, initial to consensus. Shift by males > females b) Risky-shift, initial to post consensus decisions. Shift by females < males c) Shift by the 22 males (exper. gr.) maintained over 2-6 weeks. C. gr. - no systematic shift. High initial risk takers ranked as more influential.	M.p < .005 F.p < .001 N.S. M.p < .005 F.p < .001 N.S. M.p < .05 F.p < .005
Wallech, Kogan & Bem 1964.	168 male, 168 female students.	C. gr. individual decisions for problems 6-10 as for problems 1-5. Exper. grs. - individual decisions for problems 1-5, then the following for problems 6-10. Exper. gr. 1 - personal responsibility, group decision. Exper. gr. 2 - group responsibility, individual decision. Exper. gr. 3 - group responsibility, group decision, chance designation of responsible member. Exper. gr. 4 - group responsibility, group decision, group designation of responsible member.	Change in risk taking on intellectual problems 6-10 in comparison with problems 1-5.	Results for males. Exper. gr. 1 risky-shift > control. Exper. gr. 2, more cautious than control. Exper. gr. 3 & 4 - risky-shift > control.	p < .05 p < .02 p < .001
Wallach, Kogan & Burt 1965.	122 male, 139 female students.	Exper. gr. 1 - discussion to consensus. Exper. gr. 2 - discussion without consensus.	1) Change in decisions on choice dilemmas from a) initial to consensus decisions, b) initial to post manipulation decisions. 2) A measure of groups perceived change. 3) Rankings of forcefulness.	1) Exper. gr. 1 - a) risky-shift, initial to consensus. b) risky-shift, initial to post consensus. Exper. gr. 2 - risky-shift, initial to post discussion. 2) Group members recognised the risky-shift, a) exper. gr. 1 b) exper. gr. 2. 3) No difference in veridicality of judgements of exper. gr. 1 & 2. 4) Positive correlation between judged forcefulness and initial risk. Exper. gr. 1. Exper. gr. 2.	M.p < .0005 F.p < .0005 M.p < .005 F.p < .005 M.p < .005 F.p < .025 M.p < .02 F.p < .05 M.p < .05 F.p < .02 M.p < .03 F.p < .005 M.p < .02 F.p < .02
Wallach, Kogan & Burt 1967.	365 males, 297 female students.	Discussion to consensus by 4 conditions. Exper. gr. 1 - field dependent males. Exper. gr. 2 - field independent males. Exper. gr. 3 - field dependent females. Exper. gr. 4 - field independent females.	1) Change from initial to consensus and initial to post consensus decisions on choice dilemmas. 2) Time to reach consensus. 3) Judgements of direction of shifts of consensus decisions compared with the average of the group's initial decisions. 4) Judgements of forcefulness.	Females - results did not support hypotheses. Males. 1) No difference in risky shift for exper. gr. 1 & 2. 2) Time to reach consensus, exper. gr. 2 > exper. gr. 1, exper. gr. 1 - longer discussion, larger shift, exper. gr. 2 - longer discussion, smaller shift. The above two correlations significantly different. 3) Exper. gr. 1 - larger personal shift, larger perceived group shift. Exper. gr. 2 - no relation between personal shift and perceived group shift. The above two correlations significantly different. 4) Exper. gr. 1 - no correlation between initial decisions and forcefulness. Exper. gr. 2 - positive correlation between initial decisions and forcefulness. Agreement on rankings of forcefulness in exper. gr. 1 and 2.	p < .01 p < .03 N.S. p < .01 p < .01 p < .04 p < .04 p < .05
Wallach, Kogan & Wing 1968.	214 male, 194 female students.	Exper. gr. - 1) initial decisions for choice dilemmas. 2) initial decisions for risk neutral problems followed by discussion to consensus.	1) Initial decisions for choice dilemmas. 2) Rankings of persuasiveness, contribution of best ideas, guidance.	Only one significant correlation obtained, all others being very small. More risky females ranked higher on guidance than the less risky.	p < .05
Wallach, & Wing 1967.	292 males, 195 female students.	Exper. gr. - initial decisions for six choice dilemmas. Estimates of decisions made by other students.	Difference between own initial decisions and estimates of other students' decisions.	Others believed to be more conservative than self.	p < .001

* Study unpublished or unavailable.
* M. denotes male, F. denotes female.

TABLE TWO

A Summary of the Literature Review

STONER 1961
RISKY SHIFT

<u>Date</u>	<u>GENERALITY</u>			<u>PROPOSED MECHANISMS</u>					
	<u>Subject Groups</u>	<u>Stimulus Material</u>	<u>Decision Condition</u>	<u>Rationality</u>	<u>Fear of Social Censure</u>	<u>Leadership</u>	<u>Responsibility Diffusion</u>	<u>Value and Information</u>	<u>Familiarization</u>
<u>1961</u>	<u>Stoner</u> , male students of industrial management.	<u>Stoner</u> , choice dilemmas.	<u>Stoner</u> , risky shift is overt & covert.			<u>Stoner</u> , initial risk & participation. No support.			
<u>1962</u>	<u>Wallach, Kogan & Bem</u> , male & female liberal arts students. Support.	<u>Nordqvist</u> , wrote two cautious shift problems. Against.	<u>Wallach et al</u> as above & maintained for up to six weeks.		<u>Hinds</u> , consider own decisions more risky than peers. Against.	<u>Wallach et al.</u> more risky more influential. Support. <u>Marquis</u> , as above. <u>Nordqvist</u> , cautious shift, leader cautious. Against.		<u>Hinds</u> , consider own decisions more risky than peers. Support.	
<u>1964</u>	<u>Rim</u> , heterogeneous sample. Israel. Support.	<u>Wallach, Kogan & Bem</u> , intellectual problem solving. Support.		<u>Wallach et al.</u> choices of equal expected values. Against.			<u>Wallach et al.</u> varied responsibility and discussion. Support.		
<u>1965</u>	<u>Wallach & Kogan</u> , male and female liberal arts students. Support.	<u>Bem, Wallach & Kogan</u> , aversive consequences. Support.	<u>Wallach & Kogan</u> , consensus not required.	<u>Bem et al.</u> higher expected values for cautious decisions. Against.	<u>Bem et al.</u> anticipated discussion. Support.	<u>Wallach, Kogan & Burt</u> , more risky more influential. Support.		<u>Wallach & Kogan</u> , information not sufficient. Against. <u>Brown</u> , as for Hinds above.	
<u>1966</u>	<u>Bateson</u> , students. U.K. Support.	<u>Rabow et al.</u> two cautious shift problems. Against.				<u>Rim</u> , more risky more influential, have certain personality characteristics. Support <u>Rabow et al.</u> shift to caution, leader cautious. Against.			<u>Bateson</u> , Support.
<u>1967 & 1968</u>	<u>Siegel & Zuckerman</u> , "natural" groups. Support. <u>Jamieson</u> , N.Z. Support.	<u>Pruitt & Teger</u> , gambling problems. Support. <u>Siegel & Zuckerman</u> , reputations. Support.	<u>Kogan & Wallach</u> , face-to-face factor not required. <u>Siegel & Zuckerman</u> , extra-laboratory. Support.	<u>Pruitt & Teger</u> , anticipated discussion. Against. <u>Wallach & Wing</u> consider own decisions more risky than peers. Against.	<u>Wallach, Kogan & Burt</u> , field dependent males, more risky not more influential. Against. <u>Kogan & Wallach</u> , defensive & anxious subjects. Result as above. Against. <u>Wallach, Kogan & Burt</u> , high risk takers not more persuasive in general. Against.	<u>Kogan & Wallach</u> , high anxious shift more than low anxious. Support. <u>Wallach, Kogan & Burt</u> , comprised field dependents & independents. Some support. <u>Pruitt & Teger</u> , 1. Discussion of filler items, no shift on gambling items. No support. 2. Riskier initial decision, greater shift to risk. Against.	<u>Wallach & Wing</u> , consider own decisions more risky than peers. Support. <u>Teger & Pruitt</u> , 1. Restricted information smaller shift than discussion. Partial support. 2. Riskier initial decision, greater risky shift. Support. <u>Kogan & Wallach</u> , risky shift for listening subjects but less than discussion subjects. Partial support. <u>Lamm</u> , listeners shift less but viewers shift as much as discussion. Partial support.	<u>Flanders & Thistlethwaite</u> , Support. <u>Pruitt & Teger</u> , six experiments, all against. <u>Kogan & Wallach</u> , and also <u>Lamm</u> , listeners shift less than discussion groups. Against.	

stimulus materials and decision conditions. Experiments relevant to these findings will now be considered. All these studies have used an experimental paradigm similar to that of Stoner and unless otherwise stated, have used the Wallach and Kogan choice dilemmas.

1. Subject Groups

One explanation of Stoner's results would suggest that risk may be valued by males or, more specifically, by male students of industrial management. Therefore it was necessary for Stoner's findings to be generalised to other subject groups. However it has been demonstrated that the risky-shift is not limited to male graduate students of industrial management or to males. Wallach, Kogan & Bem (1962) and Wallach and Kogan (1965) have demonstrated the risky-shift with undergraduate students of both sexes enrolled in liberal arts courses. While most studies which have demonstrated the risky-shift have used students of either or both sexes, the phenomenon is not limited to student subjects. Marquis (1962) found the risky-shift occurred with middle-level managers and Rim (1964) with a heterogeneous sample composed of "housewives, clerks, foremen, members of a kibbutz, teachers, students, technicians, army officers etc." Nor is the phenomenon cultural specific as Rim (1964, 1966), has

observed the risky-shift in Israel, Bateson (1966) in the United Kingdom, and Jamieson (1968) in New Zealand.

All of these studies have, however, used groups of subjects who have been assembled solely for the purpose of the experiment. Siegel and Zajonc (1967) used groups composed of a psychiatrist, a psychologist and a social worker. These groups were accustomed to meeting for the purpose of making group decisions concerning treatment for patients following individual consideration of cases. The risky-shift was observed for these subjects, the stimulus material being six Wallach and Kogan choice dilemma problems and six clinical dilemmas written by Siegel and Zajonc. Thus the risky-shift also occurs for established groups of subjects regularly involved in decision making as well as for ad hoc groups of subjects.

These several studies suggest therefore, that the phenomenon does have considerable generality across diverse subject groups.

2. Stimulus Materials

The Wallach and Kogan choice dilemma problems describe hypothetical persons and hypothetical situations so that subjects who make decisions for these dilemmas do not experience the outcomes of these decisions. However the risky-shift does generalise to other stimulus materials where decisions do have real outcomes. Wallach, Kogan and

Bem (1964) used stimulus material in which risks and payoffs were derived from possible monetary gain or loss for intellectual problem solving performance. The task in this experiment was the answering of ten multiple choice questions from old College Board Examinations. Payoff could vary from \$15 to \$1.25 as subjects were only paid for questions answered correctly. Subjects chose the difficulty level of the question they wished to try, this being defined as the probability of being incorrect and varying from 0.1 to 0.9. Payoff varied correspondingly from 17 cents to \$1.50. These amounts were set so that the expected values for various difficulty levels were equal. Thus it was no more rational to select any one difficulty level rather than any other.

The major result as it bears upon the generality of the risky-shift phenomenon, was that shifts to acceptance of higher difficulty levels were found when group discussion to consensus took place. Discussion to a consensus leads to a risky-shift therefore, even though the decision maker knows that he will directly experience the consequences of his decision.

Although real consequences were involved in the Wallach, Kogan & Bem (1964) study, the consequences could only be positive as the subject could not leave the experiment

with less money than he had when he came. In fact, no matter what their performance, all subjects knew they would be paid at least \$1.25 for their participation in the experiment.

Bem, Wallach & Kogan (1965) therefore emphasised the aversive consequences for the failure of a decision to result in the attainment of the desired goal. The aversive consequences were physical pain and discomfort. The experiment was presented as a study concerned with physiological effects on problem solving, subjects being asked to undergo physiological stimulation produced by the taking of certain drugs for about fifteen minutes before engaging in a forty-five minute session of problem solving. They were told that some stimulants produced unwanted disruptive side effects for some individuals e.g. nausea and intense sinus pain, which prevented them engaging in the problem solving. Further, it was explained that it was not possible to predict which subjects would be affected but it was known approximately what proportion of the population would yield the side effects in response to certain stimulants. Therefore subjects were being given the chance to choose which stimulant they wished to take by indicating the probability of experiencing side effects that they were prepared to accept.

Payment increased from \$2.50 for a stimulant which had a 10% likelihood of inducing side effects, to \$25 for a 90% probability level, providing the side effects were not experienced. Thus for a greater payoff, subjects had to take greater risks of earning no money since if they experienced the side effects they could not engage in problem solving and so would not receive any payoff. They also had to risk the increased possibility of the unpleasant side effects.

The now familiar result was found once more. A group discussion to consensus concerning the preferred risk to be taken resulted in a decision more risky than the average of the pre-discussion individual decisions.

Fruitt & Teger (1967) have supported the findings by Wallach, Kogan & Bem (1964) and Bem, Wallach & Kogan (1965) of a risky-shift in situations which have real consequences for the individual. Fruitt & Teger used six gambling situations, all being even money bets. The first three were designed to measure probability preferences and the second three, variance preferences. Subjects made individual decisions and then discussed each item in a group before making a second individual decision. Control subjects simply made repeat decisions. The experimental group shifted significantly further to risk than the

control group for both probability and variance preferences.

The experiment by Siegel & Zajonc (1967) using psychiatrists, psychologists and social workers is also of relevance here. Subjects were making decisions on the basis of their professional experience and their decisions were open to criticism by other members of the group. Hence this situation can be said to have both positive and negative consequences for the subjects in terms of acceptance or rejection of their professional opinions by other professionals. However a risky-shift did occur.

Thus the phenomenon appears not to be limited to the hypothetical choice dilemma problems but generalises to situations where there is the possibility of both positive and negative outcomes for the subjects.

3. Decision Conditions

In addition to varying subject groups and stimulus materials, decisions have been made under a number of conditions in order to further investigate the generality of the risky-shift phenomenon.

While it is clear that the group decision is more risky than the average of the individual decisions, it is important to know if this shift to risk endures in subsequent individual decisions. In Stoner's (1961) study,

after group consensus decisions had been made for all twelve choice dilemmas, subjects were asked to make further individual decisions. The mean of these post manipulation individual decisions was more risky than the mean of the pre-discussion individual decisions, although slightly more conservative than the group decision. Wallach, Kogan & Bem (1962) and Wallach & Kogan (1965) also requested further individual decisions after the discussion of all the dilemmas was completed. These decisions were significantly more risky than the initial individual decisions. It seems therefore, that the group consensus not only represents overt compliance in the group setting, but is accepted at a covert level as well. This result has been supported in many later studies (Kogan & Wallach 1967; Lamm 1967; Wallach & Kogan 1965; Wallach, Kogan & Burt 1967). Wallach, Kogan & Bem (1962) have shown that this effect of group consensus in moving persons toward greater risk taking in their subsequent individual decisions is maintained over at least six weeks.

A further decision factor investigated was the role of consensus per se, in producing the risky-shift. Wallach & Kogan (1965) compared post discussion individual decisions of subjects who had discussed the situations without a

consensus requirement, with the consensus decisions made by other groups of subjects. Both conditions shifted significantly to risk and there was no significant difference in the shifts of the two conditions. Thus a consensus requirement is not necessary to produce the risky-shift. This result has also been supported in other studies e.g. Kogan & Wallach (1967), Pruitt & Teger (1967). Wallach, Kogan & Burt (1965), in addition to replicating this finding, presented further evidence for the similarity of discussion to consensus and discussion without consensus conditions. Subjects in the latter conditions were asked, after they had made post-discussion decisions, to estimate the mean initial and post decisions for their group and then to indicate whether the post decision mean was much the same, more cautious, or more risky than the mean of pre-discussion decisions. Subjects in the discussion to consensus condition did similarly but compared initial and consensus decisions. Both conditions recognised that a risky-shift had occurred and there was no difference between the two conditions in the degree of recognition of the risky-shift. Wallach et al offer this as further evidence for the psychological comparability of the two conditions.

Kogan & Wallach (1967) have investigated a further condition under which decisions are made. Following individual decisions on the choice dilemma items, subjects discussed the items over an inter-communication system thus eliminating the face-to-face factor in the discussion. Both discussion to consensus and discussion without consensus conditions were used. Risky-shifts of the same magnitude were manifested by both conditions. Therefore, it appears that the face-to-face component previously present in the group discussion is not a necessary condition for obtaining the risky-shift.

A further decision factor has recently received some limited attention. This concerns the experimental setting for the research. Is the risky-shift solely a laboratory phenomenon or does it also generalise to the extra-laboratory world? The experiment by Siegel & Zajonc (1967) which found a risky-shift for psychiatrists, psychologists and social workers was carried out in the environment in which the subjects were regularly involved in decision making. Thus the risky-shift phenomenon has not been limited to decisions made in the laboratory.

4. Conclusions

It can be seen that the risky-shift has considerable generality. It occurs for subjects of widely differing age, occupational and cultural groupings and for subjects of both sexes. Siegel & Zajonc (1967) have demonstrated

the risky-shift in natural groups accustomed to group decision making, so that the phenomenon is not limited to laboratory situations. Neither is it limited to the Wallach & Kogan hypothetical dilemmas but also occurs in situations where subjects experience the outcomes, both positive and negative, of their decisions. In addition to this, the group's tolerance of greater risk is accepted by individuals at the covert level as well as at the overt level and this shift to greater risk has been maintained over at least six weeks. Further, it has been demonstrated that neither discussion to consensus nor face-to-face contact is required for discussion to produce a risky-shift.

However there is some limitation to the generality of the risky-shift. With considerable consistency, e.g. Wallach, Kogan & Bem (1962), Teger & Pruitt (1967), Pruitt & Teger (1967), two of the choice dilemma problems have shifted to caution. These are problems five and twelve. Problem five poses the dilemma of whether a light metals company should invest in a foreign country where returns are high but politics unstable or in the U.S. where there is an assured moderate return on investment. Problem twelve concerns a couple considering marriage who have been having sharp differences of opinion such that they

have decided to seek professional help with the result that they feel a happy marriage is possible but not assured. This shift to caution has tended to be disregarded but should have, as has been mentioned by Pruitt & Teger (1967), received more attention than has been the case.

One exception has been the work of Rabow, Fowler, Bradford, Hofeller & Shibuya (1966). Rabow et al wrote one further item and rewrote problem ten of the choice dilemmas instrument so that it was possible for subjects to evoke more support for the less risky alternative than the above authors considered was generally possible on the original choice dilemma item. On both problems, subjects shifted to caution as a result of group discussion although they did shift to risk on three other choice dilemmas used as control items. In addition to this, Rabow et al altered two further choice dilemmas in an effort to increase subjects' involvement in the problem. The alteration was to make, in one case "your father", and in the other case "your brother", the central person in the problem. Decisions for these problems did not change as a result of group discussion.

Brown (1965) has reported that Nordhøy (1962) wrote two further problems that also shifted consistently to

caution while some others he wrote showed no shift. To quote Brown. "Apparently group decisions on problems involving risk are sometimes riskier than the mean of prior individual decisions, sometimes more cautious, and sometimes not significantly different from the mean."

Thus it would appear that group decisions are related to individual decisions in the three ways that are logically possible i.e. the group decision may be more risky, more cautious or may represent the average of the individual decisions made prior to discussion. However, this relationship does appear to be consistent for particular problems. A problem that shifts to risk does so with considerable consistency as does a problem that shifts to caution.

Since the majority of stimulus sets to date i.e. ten of the twelve choice dilemma problems, the Wallach, Kogan & Bem (1964) intellectual problems, the Bem, Wallach & Kogan (1965) aversive consequences situations, Pruitt & Teger's (1967) gambling items, and Siegel & Zanjoni's (1967) clinical dilemmas, have shifted to risk consistently, considerable generality can be ascribed to this phenomenon of the risky-shift but the limitations to its generality must not be overlooked.

B. Proposed Explanations of the Risky-Shift

The risky-shift literature raises a new and interesting set of problems in the area of group processes. Why does the group discussion cause both individual and group decisions to move in a risky direction in the majority of situations so far investigated? A number of possible causal mechanisms have been proposed and the experimental evidence relevant to these will now be reviewed.

1. Greater Risk Taking As More Rational

Kogan & Wallach (1967) have considered whether greater risk taking represents a more rational approach than greater conservatism. Putting several minds to work on a task in group discussion, they say, would probably permit a more thorough analysis of the information pertinent to the task than would be possible when a person works alone.

There are two experiments which are relevant to the assessment of the rationality hypothesis. In the intelligence problem solving experiment by Wallach, Kogan & Bem (1964) choices available were of equal expected value, so that shifts toward greater risk or conservatism could not be justified on rational grounds. As was reported earlier, group discussion nevertheless produced a shift toward enhanced risk taking. Thus in this study, considerations of rationality were neutral with regard to the

risk versus conservatism issue, but a risky-shift was still observed.

The second relevant experiment is that by Bem, Wallach & Kogan (1965) which concerned the risk of physical pain and discomfort. As in the above experiment, explicit information about probabilities and payoffs was provided but on this occasion the expected values of the various possible choices increased for more conservative decisions i.e. conservative choices were more rational than risky choices. The rationality hypothesis would therefore predict a more conservative choice for the group decision than for the mean of pre-discussion individual decisions. However, group discussion caused a shift toward greater risk taking.

Thus it must be concluded that the proposal that groups shift toward greater risk taking because they find the more risky choice to be more rational than the conservative choice does not seem to be supported.

2. Anticipated Sympathy from Others' Presence*

Another possible explanation of the risky-shift which has been examined by Kogan & Wallach (1967) derives from the social support that a person can anticipate from others in the event that a risky decision leads to failure to attain the desired goal rather than to success. If an

* This proposed mechanism has been omitted from Table 2 as there is only one study relevant to it.

individual knows that others who agree with his views will be present when the consequences of his decisions are experienced, he may be willing to accept a greater risk of failure than would otherwise be the case. Thus the significant factor in the group discussion is the development of an expectation to the effect that if one's decision gives rise to an undesirable state of affairs, others who made the same decision will be present to provide sympathy and emotional support.

Some indirect support was already available for this possibility. Schachter (1959) had shown that persons who expect to undergo an experience of painful stimulation prefer to spend their time waiting in the company of others awaiting the same stimulation rather than alone. To move from such an observation to an explanation of the risky-shift involves a considerable step however.

Rettig (1966) showed that the amount of cheating was greater when subjects made decisions in the presence of others working on the same task than when they made decisions alone. But of course this may not generalise, as Rettig has pointed out, to more customary forms of risk taking.

There is however, some evidence that does bear directly on the question. In the aversive consequences experiment

by Bem, Wallach & Kogan (1965) some subjects, having made initial individual decisions, took the questionnaire a second time with the understanding that they might be selected for work involving groups rather than individuals. Subjects were told that, if selected for group work, they would be together with two others who had experienced the same physiological stimulation. Following these instructions, subjects were requested to make new decisions as to the stimulations which they would prefer to undergo if selected for a group task. Thus decisions were made with the anticipation of experiencing the outcome with others who had made the same decisions. However, the result was a shift toward greater conservatism rather than a risky-shift.

Thus the expectation by a subject that others who agree with his views will be present when the consequences of his decisions are experienced does not appear to constitute an explanation of the risky-shift.

3. Fear of Social Censure

This proposal (Pruitt & Teger 1967) suggests that individuals adhere to a norm of moderation when making their initial decisions because others might disapprove of risk. Thus, although they might prefer to take a considerable risk for a particular item, they take only a

moderate risk. The reason, according to this explanation, that people change after a discussion, is a reduction in the fear of criticism for being excessively risky which results from seeing that others are being equally or more risky. This reduced fear of criticism makes them feel free to move to a more risky position.

Some support for this proposal is found in the aversive consequences experiment (Bem, Wallach & Kogan 1965). Subjects, having made their initial decisions were asked to make second decisions, being told that in the next stage of the experiment they would participate in a group discussion to consensus for which these decisions would serve as recommendations. These second decisions were more cautious than the initial decisions. The fear of social censure theory would predict this result. This follows from the assumption that anticipation of the need to defend one's views in front of one's peers arouses the fear of social censure to a greater extent than the usual anticipation that the experimenter will read one's answers at a later date.

However Pruitt & Teger (1967) failed to support this result using the choice dilemmas instrument. Subjects who were told before their initial decisions were made that

they would have to argue in favour of these decisions, were neither more risky nor more cautious than control subjects who made decisions in the usual manner.

Further evidence against this theory is the finding, (Hinds 1962, Brown 1965, Wallach & Wing 1967) to be considered more fully later, that individuals consider their initial decisions to be more risky, not much the same as, or more conservative than others' initial decisions as would be predicted by this theory.

Thus, apart from the one positive finding by Bem, Wallach & Kogan, the evidence does not support this theory.

4. Leadership

The mechanism suggested initially by Wallach, Kogan & Bem (1962), that has been favoured by Marquis (1962), and by Collins and Guetzkow (1964) and which has been experimentally investigated in a number of studies, is leadership. If one member in the group is more influential than others, the group will shift to his position. Of course, if the risky-shift is to be explained in this way, it must be shown that those who are influential are for some reason inclined to take greater risk than are the less influential. Marquis (1962) when discussing possible causes of the risky-shift, said, "The best lead at the

moment is that the members whose initial decisions were the more risky are disproportionately more influential."

Are the more risky individuals more influential? Stoner (1964) investigated the relationship between risk taken on the initial decisions for the choice dilemmas and participation in the group discussion. No relation was found between the two. However, other studies have offered support for a leadership theory. After the post discussion individual decisions for the twelve choice dilemmas was completed, Wallach, Kogan & Bem (1962) requested that each subject rank everyone in the group, including himself, in terms of how much each subject influenced the final group decision. The ranks significantly correlated with the riskiness of initial decisions i.e. more risky individuals were seen as more influential. Marquis (1962) obtained a similar result as did Wallach, Kogan & Burt (1965) for rankings of forcefulness.

Only two studies have failed to find this relationship. Kogan & Wallach (1967) used four types of groups - low anxiety, low defensiveness; low anxiety, high defensiveness; high anxiety, low defensiveness; high anxiety, high defensiveness. No correlation was found between initial risk and perceived influence although a risky-shift did occur.

The second negative result was reported by Wallach, Kogan & Burt (1967). Field dependent males (as measured by the Embedded Figures Test developed by Jackson, Messick and Myers 1964) following a discussion of the choice dilemmas items, did not rank more risky individuals as more forceful. On the other hand, field independent males did rank more risky members as more forceful. Since both conditions did shift to risk, Wallach, Kogan & Burt concluded that while a leadership mechanism may be responsible for at least some of the risky-shift in field independent male groups, some other mechanism must be evoked to explain the shift by field dependent males.

Rim (1964, 1966) has also been concerned with personality factors and leadership. His results suggest that certain individuals are more influential than others and that they have certain personality characteristics. His studies suggest that leaders are those who score high on extraversion on Eysenck's Short Questionnaire for the Measurement of Two Dimensions of Personality (1958); that the more influential score high on the Mach IV scale (Christie & Merton 1955) which is designed to measure the disposition to manipulate interpersonal relationships; and that leaders score above average on Radicalism and Tender-mindedness as measured by Melvin's (1953) scale of social attitudes.

Thus although there is considerable evidence to support the suggestion that more risky individuals are more influential it does appear from the two negative results, that risky-shifts can take place in groups without the appearance of greater influence by high risk takers.

In addition to this negative evidence, there is a possibility that the positive relationship found in a number of studies between initial risk and influence is subject to an alternative explanation. Risk-prone persons may have seemed more influential simply because, for other reasons, the group shifted to risk. Some evidence supports this possibility. Mention has already been made of problems written by Nordhøy (1962) and by Risbow et al (1966), discussion of which resulted in a shift to caution. In both cases, the perceived leader was the individual who advocated caution. This suggests that correlations between initial risk and perceived influence cannot be interpreted as causal support for a leadership mechanism.

Wallach, Kogan & Burt (1968) considered that a leadership hypothesis would be more firmly supported if it could be demonstrated that a high risk taker was a more persuasive person in general. Risk taking was measured by the choice dilemmas instrument and groups of five were then

composed of individuals who occupied a range of initial risk positions, their task being to discuss various problem situations. In some of these situations the alternatives were balanced for riskiness and in other cases had nothing to do with risk. After the discussion, group members ranked everyone, including themselves, on degree of influence in the discussion, contribution of the best ideas and provision of the most effective guidance to the discussion. High risk takers were not seen as more persuasive in male groups and only as slightly more persuasive in female groups (riskiness correlated with guidance was significant at the .05 level). They concluded that "the risky-shift phenomenon cannot be attributed to greater general persuasiveness as a general characteristic of high risk takers in male groups, while this factor can play no more than a small role in female groups."

Thus while the evidence does not favour a leadership theory, the possibility remains that high risk takers may assume a more active role in discussion of items that shift to risk and low risk takers a more active role in discussion of items that shift to caution, perhaps because they sense they are in tune with cultural norms favouring risk and caution respectively.

5. The Responsibility Diffusion and the Value and Information Interpretation

Two major competing explanations of the risky-shift are responsibility diffusion (Wallach, Kogan & Bem 1964) and Brown's (1965) value and information explanation. Since a number of studies have attempted to support the one while criticising the other, these competing explanations will be considered together.

Le Bon (1895) suggested that crowds undertake exceptionally dangerous and violent actions that would not be undertaken by individuals acting alone because individuals have a feeling of anonymity when part of a crowd. This causes them to feel less than proportionately responsible for corporate actions. In the risk taking context under consideration, Wallach, Kogan & Bem's (1964) explanation suggests that people are initially fearful of unfavourable outcomes if the risky-alternative is picked. However, because of emotional bonds formed among group members during the discussion, they feel that the responsibility for any outcome is shared and that they are, as individuals, less than proportionately responsible for any unfavourable outcome.

There are some difficulties to be reconciled if we accept this explanation. This theory cannot explain a

shift to caution and so its utility is limited since it is clear that not only the shift to risk but also the shift to caution, although admittedly less frequent, must be explained. On the other hand, Brown's value and information theory can explain both a shift to risk and a shift to caution.

Brown (1965) suggested that discussion of information favouring risk rather than caution was the reason for the risky-shift. Perhaps points are made in the discussion that some group members had not thought of, and perhaps more of these favour risk than caution. Nordhøy (1962) undertook a content analysis of discussions of the choice dilemmas. In all twelve situations there were more arguments favouring the direction in which the decision shifted than there were favouring the other direction - i.e. information favoured risk for the ten problems that typically shift to risk while information favoured caution for problems five and twelve, the two that typically shift to caution. This suggested that information was the causal mechanism. But why does information predominantly favour risk? Brown suggested that there is a cultural value placed on risk. It may be that values cause people to define most problems as

warranting a risky approach and so information in the discussion favours risk. At this point, Brown lessened his emphasis on information favouring risk as the causal mechanism and instead concentrated on an explanation in terms of value. According to Brown, because of the value placed on risk, subjects take initially the riskiest approach which they consider within reason and often feel that they are well ahead of the rest of the group in riskiness. However, during the discussion, many discover that others are taking an equal or larger amount of risk. Hence they conclude that they are not fully satisfying the value of risk and so move toward a more extreme position on that value. Thus the function of the discussion is to give specificity to the value of risk. In Brown's words, "The content of the discussion, the arguments pro and con are of no importance by this theory. It is the information about other people's answers that makes individuals move toward risk after group discussion."

Brown in this interpretation therefore, has disregarded information other than the knowledge of the decisions made by other group members but in a reconsideration of the cause of the risky-shift, Brown (1965) widened his interpretation to include both value and information favouring

risk since it would be expected that a problem eliciting a value of risk would also result in the discussion of information favouring risk and that this, as well as value, would contribute to the risky-shift. Thus the value and information interpretation suggests that most problems elicit a value of risk so that individuals initially take what they consider to be a risky position. However, some subjects find in the group discussion that others are taking greater risk and this leads them to feel that they are not adequately satisfying the value of risk. In addition the value of risk leads to the discussion of information favouring risk, some of which at least some individuals would not have considered. Both these factors, value and information, according to Brown, cause the risky-shift.

The discussion of this mechanism has focused mainly on the way in which it explains the risky-shift but the shift to caution can also be explained by this mechanism. Thus it can be postulated that some problems elicit a value of caution and this leads to a cautious shift for these problems in the same manner as a risky-shift occurs for problems which elicit a value of risk.

Thus at an intuitive level, Brown's theory appears to explain both the risky-shift and the cautious shift thus

enjoying greater generality than the responsibility diffusion mechanism. However, does the experimental evidence give greater support to the value and information interpretation?

a) Empirical tests of the responsibility diffusion interpretation

Although Wallach & Kogan and their co-workers have repeatedly advanced responsibility diffusion as the explanation of the discussion-induced risky-shift, evidence favouring the theory is not strong and is generally indirect.

Kogan & Wallach (1967) say that the concept suggests that an individual in a context of group discussion feels less personal responsibility for failure in the pursuit of risky options than he would if deciding alone. It becomes important therefore, they say, to study the consequences of increasing a person's sense of responsibility and permitting it to be shared by others through group discussion.

In the Wallach, Kogan & Bem (1964) study using the intellective problem solving items, some subjects had to solve the problems on behalf of a number of subjects and so were responsible for the wins and losses of other group

members as well as for their own. Furthermore, responsibility for others was created under two kinds of circumstances for different subjects. Some decided on their preferred level of risk individually, but others made their decisions through group discussion to consensus. Conservative shifts occurred in the former condition but the latter resulted in strong shifts towards greater risk taking. Thus, say Kogan & Wallach (1967), responsibility for others coupled with group discussion and its opportunity for sharing of this responsibility not only overcomes the conservatism that results when such responsibility is created without the opportunity for discussion, but also adds a considerable push toward taking more risk. While Kogan & Wallach offer this evidence as support for diffusion of responsibility, it is difficult to see why this evidence does not equally well support the value and information theory since subjects who made their decisions with the assistance of group discussion became acquainted with the decisions of other subjects, thus allowing the value and information mechanism to operate, while subjects in the other condition did not have access to this information. Thus while the difference in the risky-shifts of the two conditions may possibly be explained by diffusion of responsibility, this difference could also be explained by

value and information.

In the same experiment, Wallach et al had one condition reach, through discussion, a group decision with the knowledge that any group member was responsible only for his own wins or losses. In another condition group decisions were made with the knowledge that any one member might have to solve the problem on behalf of the group i.e. one member would be responsible for the wins and losses of all group members. A risky-shift occurred for both conditions but was larger when responsibility was felt for others as well as for oneself. The authors of the study reason that subjects in this latter condition had greater responsibility and so more responsibility to diffuse. The finding that this condition did shift further to risk that the group with less responsibility is therefore taken as supporting the diffusion of responsibility explanation.

This writer suggests however, that Wallach, Kogan & Bem may have incorrectly assumed that group members did feel increased responsibility when they knew that one of the group would be chosen to solve the problem for the group. In fact, it is possible that felt responsibility was lessened. Since only one of the group of three was

going to be required to solve the problem, it was more likely that any one individual would not have to solve the problem being considered than that he would have to so act. Thus these groups may have taken more risk because they felt less responsibility than the other condition, i.e. they may not be responsible for their own payoffs, let alone the groups, whereas in the other condition, subjects were always responsible for their own payoffs.

Further evidence that has been taken as supporting the mechanism, is a nearly significant finding ($p < .06$) that high anxious individuals show a greater risky-shift. Kogan and Wallach (1967) say that this is expected if it is assumed that these people are the ones most concerned about negative outcomes, and hence, are the ones most prone to anxiety reduction in the group situation.

Personality variables have been considered in another study by Wallach, Kogan & Burt (1967) in an effort to support the responsibility diffusion explanation. They argued that if group discussion leads to the operation of responsibility diffusion because of the effective bonds formed among group members during the discussion, the aspects of discussion that are relevant to the risky-shift phenomenon may well be more effective than cognitive in

nature. Thus they have attempted to distinguish subjects for whom affective factors may be more important and those for whom the cognitive factor is comparatively more important. The former they say, may well be field dependent subjects (as measured by the Embedded Figures Test developed by Jackson, Messick & Myers 1964) while the latter may be field independents. To quote Wallach et al, "It seems reasonable to expect discussion by field dependents to emphasis affective linkages among group members..... On the other hand, we would expect discussion by field independents to emphasis cognitive analysis of issues...."

Therefore, since affective factors are supposedly important for the operation of responsibility diffusion and since affective factors were expected to be present to a greater extent in field dependent than in field independent groups, it was hypothesised that field dependents should shift further to risk as a result of group discussion than field independents since responsibility diffusion should occur to a more marked extent for the former. While the results of the experiment did not allow this hypothesis to be accepted, a second hypothesis was supported for male subjects. This hypothesis stated that the longer time spent in discussion of a problem, the greater the shift to risk by field dependents but the

less shift for field independents. The basis for this hypothesis was that longer discussion by field dependents should increase affective processes facilitating responsibility diffusion, while longer discussion time for field independents should be spent in analytic discussion presumed to work against the operation of responsibility diffusion. Thus the support of this hypothesis for male subjects did offer some support for the responsibility diffusion explanation.

A further hypothesis to be supported was that the larger the risky-shift made by a field dependent person, the larger the degree of risky-shift that would be ascribed to the group of which he was a member, while no such relationship would exist for field independents. Wallach et al say that such a projection of one's shift behaviour onto the group may well serve as a means for minimising a sense of personal responsibility for one's actions. Thus the acceptance of this hypothesis also offered support for the responsibility diffusion explanation.

If one accepts the assumptions that affective factors are important for the operation of responsibility diffusion and that affective factors are important to field dependents, and if the Jackson et al instrument is

a valid measure of this construct, then the above study provides some support for responsibility diffusion as the explanation of the risky-shift.

Pruitt & Teger (1967) have presented evidence which does not support diffusion of responsibility. The stimulus material used was the gambling items mentioned earlier, because say the authors, "we wanted there to be some concrete outcome for which the subject could truly feel responsibility." Initial individual decisions were made for these items and groups then discussed non-risk filler items. They then made further individual decisions for the gambling items, being told that the decisions made by the group members would be averaged and this average played off. Pruitt & Teger reasoned that this should enable a shift of responsibility to others in the group since they were participating in the final decision by the fact that their decisions were going to be averaged together. However a non-significant shift to caution was the result.

While this result did not support the responsibility diffusion explanation, it could be argued that this was because subjects did not have a feeling that they were really part of a group since they did not discuss the gambling items. However, Pruitt & Teger argue that discussion of the filler items should have made subjects feel as much a part of a group as is ever found in this research. Alternatively, it can be argued that diffusion

of responsibility only occurs if the individual receives information about the level of risk that other group members are taking (Kogan, personal communication to Pruitt & Teger). Pruitt & Teger reply that, "If that is what diffusion of responsibility theory implies, we will agree that our experiment did not provide a test of that theory, but it does suggest that the theory should be restated."

Thus, although the conclusions from the Pruitt & Teger experiment can be questioned, they do not appear to be favourable to the responsibility diffusion explanation.

Wallach & Kogan and their co-workers have also attempted to support responsibility diffusion in a somewhat unconvincing way simply by demonstrating that other mechanisms cannot explain the risky-shift or that, at best, they constitute only partial explanations. Bem, Wallach & Kogan (1965) for example, found no support for fear of social censure, anticipation of sympathy from others' presence or a rationality explanation, the implication being that this tended to strengthen the likelihood that responsibility diffusion was the causal mechanism.

This has tended to be the approach of the responsibility diffusion supporters in examining Brown's value

and information mechanism. They have attempted to demonstrate that at best it constitutes only a partial explanation.

b) Empirical tests of the value and information interpretation

To recapitulate, Brown's explanation of the risky-shift suggests that individuals, because of a value placed on risk, make what they consider to be a risky decision and often feel that their decision is more risky than the decisions made by others. However, in the discussion, subjects become acquainted with additional reasons favouring risk (Because the value of risk elicits discussion favouring risk) and also find that some others are taking greater risk than they are themselves. Both of these factors cause subjects to move to a more risky position.

One assumption of this theory therefore, is that individuals consider their initial decisions to be more risky than those that would be made by most of their peers. This assumption would be supported if it could be shown that individuals do consider their decisions to be more risky than those made by the majority of individuals. Hinds (1962) asked subjects to indicate after they had made each initial decision, what answer they thought

two hundred other students would give, on the average, to that item. Subjects very consistently guessed that others would choose more cautiously than they had themselves. Brown (1965) supported this result. Wallach & Wing (1967) using approximately five hundred subjects, asked them after they had made decisions for six choice dilemmas, to indicate what decisions they considered other students would give. As in the two previously mentioned studies, others were believed to be more conservative.

Clearly then, one of Brown's assumptions i.e. that individuals see their decisions as more risky than those of others', is supported.

Other tests of Brown's explanation have used the procedure of providing subjects with some of the information which is present in the group discussion, e.g. information as to the decisions made by other members in the group. According to Brown's original value interpretation, this information is the factor in the discussion which causes the risky-shift, other factors being irrelevant.

Wallach & Kogan (1965) have tested this possibility by introducing an "information" condition. After individual decisions had been made for the twelve choice dilemmas, one condition was required to achieve consensus

without discussion. The names of subjects were written on a board, which could be seen by all subjects, along with their initial decision for a particular problem. Subjects were instructed to write on a piece of paper and pass to the experimenter, "the decision you feel the group can and should agree on." These decisions were written on the board. Subjects were then asked to pass a decision to the experimenter again, a number of rounds of such balloting being held until a consensus decision was reached. Subjects were free to refer to copies of the problems while this balloting occurred. However, these subjects, although they received information as to the decisions made by other group members, did not shift to risk. Thus no support was given to Brown's value interpretation.

Teger & Pruitt (1967) have criticised the above study. Wallach & Kogan asked subjects to reach a consensus that the group "can and should agree on." Teger & Pruitt suggest that group members, without the opportunity for discussion, may see an average as the only way to achieve consensus. In their own study they therefore asked subjects after initial decisions had been made, to hold up a card to indicate their initial decision for a particular choice dilemma problem. Having seen the decisions made by other members of the group, subjects

were free to change their decisions on a second showing of decisions or to maintain their previous decision. Consensus was not an essential requirement. Three rounds of this balloting resulted in a significant risky-shift but this was significantly less than the shift of the discussion condition.

While it is possible that responsibility diffusion occurring in the discussion groups accounts for this difference, Teger & Pruitt say that such a difference is also consistent with Brown's mechanism i.e. the problems elicit a value of risk, information about others' decisions shows some individuals that they are not as risky as they had considered and so they shift to risk although this shift is less than that of a discussion group. However, the argument continues, if given the opportunity for discussion, the value of risk elicited by the problems would result in arguments supporting a risky decision and it may be this additional information, not responsibility diffusion, which explains the difference between information and discussion conditions.

Before considering an experiment designed specifically to investigate the revised theory, the value and information theory, further evidence presented in the Teger & Pruitt

experiment favouring Brown's original value theory, and which the responsibility diffusion interpretation does not appear to be able to explain, will be considered.

This evidence was a positive correlation between the riskiness of the initial decision and the magnitude of the risky-shift for that problem i.e. the riskier the initial decision, the greater the shift to risk. Brown's explanation would predict this result. Teger & Pruitt say that initial risk can be easily construed as an index of the extent to which an item is perceived as warranting a "risky" or a "cautious" approach. Since, according to Brown, this perception determines the direction and, by extension of his theory, the amount of shift after discussion, such a correlation between initial risk and risky-shift would be expected. Pruitt & Teger (1967) say that the diffusion of responsibility explanation fails to predict this correlation, and in fact would tend to predict a correlation in the opposite direction, since low risk items are mostly those in which the risky alternative has more enduring consequences (such as death if a heart operation fails as in problem two of the choice dilemmas). In these items, initial responsibility should be felt most keenly and hence,

diffusion of responsibility should produce the most change to risk. Instead, these items exhibit the smallest risky-shift.* Thus the positive correlation of initial risk and risky-shift both supports Brown's mechanism and questions the validity of the diffusion of responsibility mechanism.

Kogan & Wallach (1967) experimented to test the value and information theory. In order to include both information concerning the level of risk others considered appropriate and other information considered during the discussion, groups listened to tape recordings of discussions of the choice dilemma problems. Discussion without consensus was used in order to reduce the likelihood that subjects would feel that they were expected to move to risk. The listening condition subjects, having made their own individual decisions for the choice dilemmas, heard a discussion of one problem and then made another individual decision for that problem, and so on for the twelve dilemmas. Both listening and discussion conditions shifted significantly to risk, but as in the Teger and Pruitt experiment, the discussion condition shifted significantly more than did the listening condition.

* See Appendix 4 for the table of norms of initial decisions and risky shifts for each choice dilemma as presented by Pruitt & Teger 1967.

Kogan & Wallach conclude, "the foregoing result strongly implies that an information exchange interpretation cannot adequately account for the risky-shift phenomenon." Group interaction, they say, must introduce another determinant which enhances risk taking and they mention the responsibility diffusion mechanism. However Kogan & Wallach do say, "The present work does not, of course, provide direct support for such an interpretation."

From this study it must be concluded that the value and information mechanism appears to explain at least part of the risky-shift but that some other processes apparently operating only in the group interaction further enhances the risky shift.

However, attempts have been made to demonstrate that the value and information mechanism can explain all of the discussion-induced risky-shift.

Lamm (1967) argued that a tape recording was not transmitting all of the information available in the unconstrained discussion, as the visual component was eliminated. Lamm therefore had two information conditions. One observed a group through a one way mirror and listened to the observed discussion, while the other listened to tape recordings of the discussion. While viewers shifted as much as the discussion condition,

listeners shifted less, although this difference was not significant. Lamm concluded that these results supported Brown rather than the responsibility diffusion theory.

That viewing a discussion allows only information transmission has been questioned by Kogan & Wallach (1967). They point out that given an interacting and observing group, one has created for all practical purposes, a "modeling" situation as discussed by Bandura (1965). Kogan & Wallach say that there is good reason to believe that where the interacting and observing groups are composed of respected peers, the observers will experience vicariously the emotional give and take that occurs in the interacting groups and hence will modify their risk taking dispositions in a direction consistent with the model. Thus it is possible that psychological processes other than "pure" information exchange increase in importance as the impact of the interacting group upon the observers becomes more direct.

Therefore Lamm's study cannot be accepted as having demonstrated that value and information is a sufficient explanation of the risky shift although it does confirm Kogan & Wallach's 1967 finding of a significant risky-shift for a listening condition thus supporting the

possibility that value and information may be at least a partial explanation.

c) Conclusions

What can be concluded concerning these two proposed mechanisms? The responsibility diffusion supporters have offered some evidence, often equivocal, that they have interpreted as supporting the responsibility diffusion explanation. Because of difficulties in carrying out direct experimental tests of this mechanism, the tendency of its supporters has been to attempt to demonstrate that other mechanisms are insufficient to explain the risky-shift. This has been the approach of these workers to the value and information mechanism.

There is considerable evidence to support this value and information mechanism however. Individuals do regard their decisions as more risky than those of others, greater risky-shifts occur for problems eliciting a greater value of risk, and information in the form of tape recordings or obtained by watching and listening to a discussion does result in large risky-shifts for these subjects. However, it does appear that modelling effects may be a contaminating variable in the viewing condition so that the conclusion that information provided by both viewing and listening to a discussion causes as large a shift as the

discussion-induced shift must be rejected. Therefore, as the risky-shifts of listening groups have not been as large as those of discussion groups, it does appear that other processes (e.g. responsibility diffusion) taking place in the group interaction do contribute to the risky-shift.

Thus the evidence does not support one of these mechanisms to the exclusion of the other. Rather it appears that both may constitute partial explanations of the risky-shift.

6. Familiarisation

Into this search for the causal mechanism Bateson (1966) introduced, in view of its comparative simplicity, a most parsimonious explanation. He experimentally supported the hypothesis that familiarity with the problems causes the risky-shift. He argued that subjects spend little time making their first decisions (in fact about two minutes per problem for the choice dilemmas) and so give a more cautious response than would have been given had they been thoroughly familiar with the content and implications of the problems. Using five of the choice dilemmas, Bateson had one condition discuss the problems after their initial decisions while another condition required that subjects write points for and against the

two alternatives in each problem, spending about five minutes on each problem. Following this they again made individual decisions. Both conditions shifted significantly to risk and the shift in the familiarisation condition was slightly greater than in the discussion condition.

Flanders and Thistlethwaite (1967) have supported Bateson's finding using twelve choice dilemmas and have extended his findings by demonstrating that discussion after familiarisation does not increase the shift to risk produced by familiarisation only.

Pruitt & Teger (1967) have, in six experiments, thoroughly investigated the familiarisation mechanism but have been unable to support it. Their first experiment used six choice dilemma problems and found no risky-shift as a result of familiarisation. Their next step was to undertake an exact replication of Bateson's experiment using his instructions and the same five choice dilemmas. In this case there was a trend to caution as a result of familiarisation but this was not significant.

These two investigators were ready to conclude that Bateson's results could not be supported when Flanders and Thistlethwaite did support Bateson's results. Pruitt and Teger therefore replicated the Flanders and Thistlethwaite

experiment using the twelve choice dilemmas and precisely following their instructions. They also controlled for what they considered to be a possible fault in the Flanders and Thistlethwaite experiment. This possible fault was the inclusion of Eysenck's twenty four item Extraversion Scale between the pre and post manipulation decisions. This, they considered, was a possible contaminant which could have caused subjects to shift to risk. Pruitt and Teger therefore gave half their subjects this scale when initial decisions had been made, while the other half completed a filler scale. However, familiarisation did not produce a risky-shift under either condition although the conditions did differ in that there was more shift to risk among those who had completed the extraversion scale than among those who had completed the filler scale. However this difference was not significant and so it appears that the extraversion scale was probably not instrumental in producing the shift apparently caused by familiarisation in the Flanders and Thistlethwaite experiment.

A final possible contaminating variable considered by Pruitt & Teger was that of experimenter effects. They therefore carried out a further experiment controlling for this variable - one experimenter was led to expect a shift

to risk, the other a shift to caution. Results showed a slight non-significant shift to caution with no difference between the two conditions.

Pruitt & Teger conclude that "a judgement of "not proven" must be recorded against the hypothesis that familiarisation produces a risky-shift and, hence, against the conclusion that the risky-shift produced by group discussion is due to familiarisation."

Evidence against the familiarisation mechanism is not confined to the work of Pruitt & Teger. Those studies which have compared information and listening conditions with discussion conditions also provide evidence against a familiarisation interpretation. In both listening and information conditions, subjects are able to refer to copies of the problems while they are balloting or listening and the listening condition, in addition to this, receives any information concerning the content and implications of the problems which is discussed in the interacting group. Thus these subjects become increasingly familiar with the problems and yet the risky-shift in these conditions is significantly less than in the discussion condition. Clearly more than familiarisation is needed to explain the risky-shift.

Thus the conclusion by Pruitt & Teger of "not proven" is more firmly supported when this evidence is considered.

Consequently there remains the problem of accounting for the risky-shift by mechanisms other than the parsimonious familiarisation interpretation.

7. Conclusions

What conclusions can be drawn from this consideration of proposed mechanisms? Clearly rationality receives no support in those studies in which this possibility can be tested. Other propositions which have received little, if any, support are fear of social censure and anticipated sympathy from others' presence. Leadership presents a difficult problem. While this mechanism has not received strong support, there is the possibility that high risk takers are instrumental in producing at least some of the risky-shift while low risk takers contribute to shifts to caution. Leadership therefore, may constitute a partial explanation - it may be a contributing factor. Responsibility diffusion has proved to be a difficult mechanism to test. Some evidence, limited to Wallach & Kogan and their co-workers, can be interpreted as favouring this explanation but cannot be considered to be conclusive due to associated interpretive ambiguities. Pruitt & Teger

(1967) have presented evidence contradicting the diffusion of responsibility explanation. However, studies investigating the value and information interpretation have met with only partial success. While these studies do offer considerable support for Brown's value and information viewpoint, its apparent inability to constitute a complete explanation certainly leaves some room for the suggestion that responsibility diffusion causes the remainder of the shift. Finally, while an explanation in terms of familiarisation would have been an extremely parsimonious explanation, it appears that the search for a somewhat more complicated explanation has not been wasted as it is extremely doubtful that familiarisation does explain the risky-shift.

Thus at the present state of knowledge, little in the way of a definite conclusion can be formulated. Possibly a combination of some of these proposed mechanisms will have to be considered e.g. leadership, value and information and responsibility diffusion, or alternatively, as Pruitt & Teger have suggested, "everybody is wrong and that what the field really needs is a new idea."

C. Summary

Following Stoner's (1961) finding of the acceptance of a lower probability of success both by groups and by individuals following group discussion of the Wallach & Kogan choice dilemmas, other studies undertook an examination of the generality of the risky-shift.

Wallach, Kogan & Bem (1962) and Wallach & Kogan (1965) generalised Stoner's findings from male students of industrial management to liberal arts students of both sexes. The risky-shift has also been generalised to middle-level managers (Marquis 1962), and heterogeneous samples (Rim 1964, Jamieson 1968). Neither are these findings limited to the U.S. as the risky-shift has been observed in the United Kingdom (Bateson 1966), in Israel (Rim 1964), and in New Zealand (Jamieson 1968). Siegel & Zajonc (1967) demonstrated that the phenomenon is not limited to ad hoc groups.

The risky-shift has been found for stimulus material other than the choice dilemmas. Wallach, Kogan & Bem (1964) obtained a risky-shift for intellectual problem-solving where subjects were paid for problems answered correctly and Bem, Wallach & Kogan (1965) further generalised the risky-shift to a situation which emphasised the

aversive consequences which followed the failure of a decision to result in the desired goal. Pruitt & Teger (1967) found a risky-shift for gambling items and Siegel & Zajonc (1967) also reported a risky-shift in a clinical setting. Both of these studies involved real consequences for decisions made. Thus the risky-shift is not restricted to the hypothetical choice dilemma problems.

A number of decision conditions have also been investigated to further examine the generality of the risky-shift. Stoner found that the risky-shift endured in decisions made by individuals following discussion to consensus and this finding has been supported by many others e.g. Wallach & Kogan (1965) and Wallach, Kogan & Bem (1962) who also demonstrated that this effect endured for at least six weeks. Wallach & Kogan (1965) first demonstrated that a group consensus was not essential for the occurrence of the risky-shift and this result has also been supported e.g. Lamm (1967). Wallach, Kogan & Burt (1965) showed that both discussion with and discussion without consensus groups equally recognised that a risky-shift had occurred. Kogan & Wallach (1967) found that the face-to-face factor of the discussion was not required and Siegel & Zajonc (1967) have observed the risky-shift in the extra-laboratory

world.

On the basis of the review of studies concerned with the generality of the risky-shift, it was concluded that the risky-shift did have considerable generality. However, it was pointed out that two of the choice dilemmas had regularly shifted to caution and that Nordhøy (1962) and Rabow et al (1966) wrote some problems that shifted to caution. Thus it was concluded that although a risky-shift had occurred more frequently than a cautious shift, there were limits to the generality of the risky-shift.

The second major section of the literature review was concerned with the explanation of the risky-shift. The evidence relevant to a number of mechanisms proposed as explanations of the risky-shift was reviewed. Neither rationality, anticipated sympathy from others' presence, or fear of social censure could be supported. A leadership explanation did receive some support as a number of studies had shown that those whose initial decisions were more risky were ranked as more influential in the discussion. However, Nordhøy (1962), and Rabow et al (1966) found that for problems that shifted to caution, the perceived leader was also cautious. This suggested that the relationship between perceived leadership and initial

risk was not a causal one. Further negative evidence was the finding by Wallach, Kogan & Burt (1968) that high risk takers were not more persuasive people in general. It was concluded that the evidence did not favour a leadership interpretation but that the possibility remained that high risk takers were more influential in discussion of risk while low risk takers were more influential in discussion of caution.

Two other mechanisms considered were responsibility diffusion and value and information. Responsibility diffusion was not strongly supported, the relevant evidence being largely indirect and often equivocal. Brown's (1965) value and information interpretation received considerable support. It has been demonstrated (Hinds 1962, Brown 1965, Wallach & Wing 1967) that individuals do regard their initial decisions as more risky than those of their peers. Also favouring this interpretation was the finding (Teger & Pruitt 1967) of a positive correlation between initial risk for a problem and the risky-shift for that problem. The findings that information about others' decisions causes a risky-shift (Teger & Pruitt 1967) and that listening to a discussion causes a larger risky-shift, although smaller than that of the discussion groups, (Kogan & Wallach 1967, Lamm 1967) also gave some support to this

interpretation. Lamm (1967) demonstrated that simultaneously viewing and listening to a discussion resulted in as large a risky-shift as that induced by discussion. However, this result has been criticised in that subjects may experience vicariously the emotional give-and-take that occurs in the discussion groups. It was concluded that the value and information interpretation received considerable support as a partial explanation of the risky-shift.

The final proposed mechanism considered was familiarisation. Positive findings were restricted to Bateson (1966) and Flanders & Thistlethwaite (1967). Pruitt & Teger (1967) in six experiments did not support this mechanism and the finding that listening groups exhibit smaller risky-shifts than discussion groups was further evidence against a familiarisation interpretation.

In concluding it was stated that the explanation of the risky-shift was far from clear and that a combination of some of the proposed mechanisms perhaps requires investigation.

CHAPTER TWO

Rationale and Aims of the Present Research

A. Rationale

A review of the studies which have investigated possible causes of the risky-shift suggests that some lines of investigation may be potentially more fruitful than others. Consider for example, those studies that have attempted to break down the discussion into a number of components and compare the magnitudes of the risky-shifts induced by each component. Wallach & Kogan (1965) compared the risky-shifts of three conditions - discussion to consensus, discussion without consensus and consensus without discussion; Teger & Pruitt (1967) compared the risky-shift of an information condition (acquaintance with the decisions made by other group members*) with that of a discussion condition; Kogan & Wallach (1967) compared discussion and listening conditions and Lamm (1967) compared discussion, viewing and listening conditions. Such studies appear to this writer to be of considerable importance as they may be able to show whether or not group interaction per se, is required to produce risky-shifts as large as those observed for discussion conditions. If it

*This information will be referred to as restricted information as opposed to the information transmitted by a tape recording of a discussion which will be referred to as unrestricted information.

can be shown that participation in a discussion is not required for risky-shifts as large as the discussion-induced shifts to occur, this may simplify the search for the causal mechanism as this would suggest that those mechanisms that stress the importance of the group interaction, e.g. responsibility diffusion, can be disregarded. On the other hand, if it becomes clear that there is a considerable difference between the magnitudes of the discussion-induced risky-shifts and those occurring as a result of listening to a discussion for example, the implication would be that more emphasis needs to be placed on processes related to the group interaction itself.

Let us review briefly the findings of those studies mentioned above that have investigated information transmission and group structure hypotheses. These studies have provided subjects with either restricted information (Wallach & Kogan 1965, Teger & Pruitt 1967) or unrestricted information (Kogan & Wallach 1967, Lamm 1967). Risky-shifts under both of these conditions have been compared with those for discussion conditions. Wallach & Kogan (1965) found that acquaintance with others' decisions per se did not cause a risky-shift, but Teger & Pruitt (1967) in a later study, having corrected what appeared to them to be a fault in that experiment i.e. that subjects may see an

average of the initial decisions of the group members for a particular problem, as the only way to achieve consensus when discussion is not permitted, obtained a significant risky-shift for their information condition. However, this shift was not large and was significantly less than the discussion-induced shift.

Studies which have provided unrestricted information have obtained larger risky-shifts for information conditions. Kogan & Wallach's (1967) listening group shifted significantly to risk, the magnitude of this shift being larger than for their previously mentioned (1965) restricted information condition but this was still significantly less than the shift of the discussion condition. However, Lamm (1967) showed that subjects who simultaneously viewed and heard a discussion shifted as much as the discussion condition itself.

It would appear that these investigations have resulted in increasing support for the information transmission interpretation. However, Lamm's (1967) study has been criticised in that the viewing subject may "experience vicariously the emotional give-and-take that takes place in the interacting groups." (Kogan & Wallach 1967). Thus more than information transmission may be occurring in this condition.

Are there any other uncontrolled variables, in addition to that mentioned above, which, if controlled, may demonstrate that information transmission, as is provided to a viewing condition, is insufficient to explain the risky-shift? This writer considers that this may be the case. Let us consider the relative publicity or privacy of the subjects' initial decisions. While the members of the discussion condition make their initial decisions known to their group during the discussion and often argue in favour of these decisions, this does not occur in the viewing condition, or in the listening condition for that matter. Thus the initial decisions of each member of a discussion group are public in the sense that these decisions are known to the other group members. However, in the viewing and listening conditions, this does not occur. The initial decisions of each viewing or listening subject are not known to the group of which they are a part and so are, in this sense, private. Their decisions are not completely private of course, as subjects would no doubt assume that the experimenter would see their decisions at a later time. Therefore the difference between the viewing or listening conditions and the discussion condition is one of relative publicity of initial decisions, rather than a pure public/private

difference. Thus the publicity in the discussion condition could be referred to as high publicity and that in the viewing or listening condition as low publicity. However, initial decisions that are known to other group members will be referred to as public decisions, while initial decisions not known to other group members, although known or potentially known by the experimenter, will be referred to as private decisions.

What effect might the making public of the position of the initial decision during the discussion, be likely to have on the risky-shifts for these groups? It is possible that the effect is one of increased commitment to the choices made so that the initial decisions become more resistant to change. Allen (1965) has discussed two factors which will contribute to the maintenance of a decision when it has been made public. To quote Allen, "One factor might be called "face saving." Appearance of inconsistency and vacillation will probably be negatively evaluated by other members, as well as by the person himself. A second factor is that a continuation of the type of response made initially helps reduce post-decision dissonance. For both these reasons, there would be a tendency to be consistent with prior public behaviour over

a series of trials."

Clearly, it would be possible for the "face saving" factor to be present in the group discussion, but it is difficult to see how this could operate to the same extent in a listening or viewing condition. In the latter conditions, the decisions of subjects are known only to themselves (and potentially to the experimenter) but not to the group. Dissonance could of course, occur in these conditions since dissonance theory would assume that any change from the original decision would cause dissonance. However, dissonance theory would also assume that changing a decision which had been made public would cause greater dissonance than changing a private decision. Brehm & Cohen (1962) for example, say that commitment increases resistance to change and that this resistance may occur whether the decision is public or private. However they say, "we would assume that a public commitment is usually more resistant to change than a private commitment."

It is suggested then, that both dissonance and face saving may be operating in the discussion to increase the subjects' resistance to changing his initial decisions to a considerably greater extent than would appear to be possible for a listening or viewing condition.

This uncontrolled variable - publicity of initial decisions - may have a considerable effect on the results of the experiments comparing information and discussion conditions. In the discussion condition, it is postulated by this writer that two factors are at work. One is the mechanism which is acting to cause an increase in the risk that the individual is disposed to accept. The other is the publicity of initial decisions which is presumed to "stabilise" these decisions, to make them more resistant to change. Thus this factor, while obviously not completely neutralising the forces for change, may, at least for some problems, prevent a change in the decisions made. However, this "stabilising" factor would not appear to be present to the same degree in viewing and listening conditions. Subjects in these conditions therefore, experience pressures to change e.g. as a result of value and information, but very little pressure to maintain their original position. Hence, the factor inducing change does not have to operate in opposition to a stabilising factor. Consequently, the risky-shift demonstrated to occur in these conditions may not be as large if this publicity factor was controlled as it presently appears. Thus it may no longer be possible to conclude with Wallach & Wing (1967) that the value and

information interpretation "may well account for the lion's share of the group-induced risky-shift effect."

While this discussion has centered on those studies investigating information and group structure hypotheses, and the possible role of publicity of the initial decisions in relation to the risky-shift in these studies, the above rationale also applies to another of the proposed explanations of the risky-shift - familiarisation.

As has been shown, evidence relevant to the familiarisation interpretation is inconclusive. For this reason alone, this possible interpretation warrants further investigation. However, such investigation may be more fruitful if it too includes control of the publicity variable. Familiarisation, taking place with the initial decisions private, may produce as large a risky-shift as the discussion-induced shift, leading to the conclusion that familiarisation is sufficient to explain the risky-shift. However, familiarisation coupled with publicity of the initial decisions, may lead to a different conclusion, specifically, that familiarisation explains little, if any of the risky-shift.

Therefore, the major purpose of the experimental investigation to be reported, was to investigate the role

of the publicity of the initial decisions as a variable which contributes to the risky-shift for a number of mechanisms which have been proposed as explanations of the risky-shift.

Four mechanisms were investigated under both public and private conditions.

1. Familiarisation. Bateson's 1966 familiarisation procedure was used to investigate this possible explanation. This will be referred to as the familiarisation condition.
2. Brown's original value explanation. This requires that subjects know the decisions made by other group members. Therefore this condition received restricted information. It will be referred to as the information condition.
3. Brown's revised value mechanism, the value and information mechanism, was the third explanation to be investigated. It requires that subjects receive unrestricted information. A tape recording of a discussion was used to provide this information since the viewing condition is susceptible to the criticism of modelling effects (Kogan & Wallach 1967). Thus this condition will be referred to as the listening condition.
4. Group structure explanations. Whether an explanation which requires group interaction (e.g. responsibility

diffusion) is necessary was investigated by comparing the risky-shifts of the preceding mechanisms with a discussion condition.

The reasons for the inclusion of familiarisation, listening and discussion conditions has already been explained i.e. the control of the publicity variable may affect the conclusions which can be drawn concerning the contribution of familiarisation and also value and information to the risky-shift. However, the reason for the inclusion of both an information as well as a listening condition has not been discussed.

While the major purpose of the experiment was to compare with the discussion condition, the risky-shifts induced by familiarisation, information and listening conditions under public and private conditions in order to see if control of the publicity variable resulted in different conclusions regarding the contribution of these mechanisms to the risky-shift than those made without control of this variable, there was another purpose also. This was to compare the risky-shifts of each mechanism with those of each other, not just with that of the discussion condition.

Of particular interest was the comparison of the

information and listening conditions as they have not previously been included in the one experiment so that a direct comparison has not been made of the risky-shifts resulting from each condition. It would appear from previous studies (Teger & Pruitt 1967, Kogan & Wallach 1967, Lamm 1967) that the risky-shift of the listening condition should be larger than that of the information condition. The risky-shift found for the information condition by Teger & Pruitt (1967) was considerably less than the shifts for the listening condition of Kogan & Wallach (1967) and Lamm (1967). While it could be concluded therefore, that unrestricted information induces a greater risky-shift than restricted information, this cannot be considered to be conclusive because of the difficulties of making meaningful between study comparisons. While the Teger & Pruitt (1967) restricted information condition did shift less than the Kogan & Wallach (1967) unrestricted condition, the discussion conditions in the former also shifted less than in the latter. Thus the difference in risky-shifts between studies may be due to uncontrolled situational factors which effect the magnitude of the risky-shift rather than to real differences in risky-shifts induced by different conditions. Therefore any conclusions drawn from between study comparisons must

be considered extremely tentative.

Another possible reason for the apparent difference between the risky-shifts of information and listening conditions, is a difference in the degree of publicity of initial decisions for each condition. While these decisions are private in listening conditions, this has not been the case in information conditions as the decisions of each subject have been written beside the subject's name on a board (Wallach & Kogan 1965), or subjects have held up cards to indicate their decisions (Teger & Pruitt 1967). Therefore, decisions were more public in these two information conditions than they have been in the listening conditions. This then, may be another reason for the apparent difference in risky-shifts induced by these conditions.

A further reason for the inclusion of the restricted information condition was that previous information conditions appear to this writer to be unnecessarily complex, the balloting procedure serving to complicate the interpretation of results. First, the effort to induce a change in subjects' decisions would surely be obvious to the subjects, thus increasing the likelihood of the operation of experimenter effects. Second, the effort to achieve consensus (which was probably less however, in the

Teger & Pruitt study than in that of Wallach & Kogan) would seem to require some give and take among subjects so that any risky-shift resulting may be due more to this procedure than to information exchange.

Thus the inclusion of both restricted and unrestricted information conditions was considered to be of considerable value as it should be possible to draw more definite conclusions concerning the difference in the shifts induced by these two conditions and the contribution of restricted information to the risky-shift.

Thus the study to be presented permits conclusions to be drawn concerning the contribution of each mechanism to the discussion-induced risky-shift and also concerning the relation of each mechanism to each other. Thus it may be found that familiarisation occurring in the information condition (since subjects have been able to refer to copies of the problems during the balloting procedures used for this condition (Wallach & Kogan 1965, Teger & Pruitt 1967) so that they become more familiar with the problems as well as receiving information) accounts for any risky-shift apparently occurring as a result of receiving restricted information.

The effect of identifying these four conditions therefore, has been to break the discussion into four

components - group interaction, unrestricted information, restricted information and familiarisation. Only group discussion includes all four components. Listening includes all but interaction (and visual cues) and information includes the last two components. Therefore familiarisation, information, listening and discussion conditions can be ranked in terms of the number of components each contains which are possible contributors to the risky-shift. It is possible therefore, that each of these components contribute to the risky-shift and that the risky-shift will increase as more of these components are present in the experimental manipulation which the subjects receive. Thus the greatest shift would be expected for discussion, followed by listening, information and familiarisation.

While the magnitudes of the risky-shifts may rank in the above order, it is more difficult to predict which of the eight conditions - the above four under both public and private conditions - will induce significant shifts to greater risk taking. Certainly, on the basis of previous experimental findings, discussion public and listening private conditions (e.g. Kogan & Wallach 1967, Lamm 1967) would be expected to result in significant shifts to greater risk taking. Whether this will also occur for listening

with initial decisions public depends largely on the effect of the publicity variable on the risky-shift. If the stabilising effect is very strong, little shift to risk will occur; on the other hand, even although the publicity manipulation may result in smaller risky-shifts for listening public than for listening private, the listening public condition may, nevertheless, induce a significant risky-shift. Experimental findings for familiarisation and for restricted information are both positive and negative so that it cannot be predicted whether these conditions will shift to risk or not.

B. Further Variables to be Investigated

A variable which one would expect to be related to the magnitude of the risky-shift, is confidence (Jamieson 1968). Thus the more confidence expressed by an individual that the decision made was the correct one, the less one would expect him to shift to risk, while an individual who expressed less confidence in his decision would be expected to shift to risk more readily. Deutsch & Gerard (1955) for example, have supported the hypothesis, in an experiment on perceptual judgement, that "the more uncertain the individual is about the correctness of his judgement, the more likely he is to be susceptible to both normative

and informational social influences in making his judgement."

However, in spite of this expectation, no relation has been found between confidence and the risky-shift. Teger & Pruitt (1967) included in the booklet of choice dilemmas for the initial decisions, a final scale to assess the confidence of subjects in their answers to the twelve items. However, no relation was found between confidence and initial decisions or confidence and risky-shift. Possibly this was because the confidence rating was not carried out for each problem and immediately after making the decision. Yet Stoner (1961) also found no relationship between confidence and risk when he measured this variable separately on each item both before and after the group decision. Unfortunately, the details of the measure of confidence are not available for either study. Teger & Pruitt simply say, "the measure used here was a rating scale in which the subject indicated his over-all confidence in all twelve decisions." Stoner's study is unpublished.

In spite of this negative evidence, confidence in decisions appeared to be a variable worthy of further investigation and so measures of confidence in each decision were included in the experimental procedure.

The other measure to be made was one of influence, this applying only to the discussion groups of course. It was expected that a positive correlation between initial risk and perceived influence would be found as it has been in many other studies e.g. Wallach, Kogan & Bem (1962), Marquis (1962), Rim (1964), Wallach, Kogan & Burt (1965). Only two studies have failed to demonstrate such a relationship. Wallach, Kogan & Burt (1967) did not find this relationship for field dependent males and Kogan & Wallach (1967) also failed to support the more usual finding, their subject groups being of the following types - high anxiety, high defensiveness; high anxiety, low defensiveness; low anxiety, high defensiveness; and low anxiety, low defensiveness. Thus the negative findings are limited to special subject groups with a positive correlation between initial risk and perceived influence being the more usual result.

C. Hypotheses

An experiment was designed to test the following hypotheses.

1. Risky-shifts will occur for discussion public and listening private conditions.

2. More initial decisions will be changed when these have remained private than when they have been made public.
3. Risky-shifts will be larger within each condition when initial decisions have remained private than when they have been made public.
4. Greater risky-shifts will occur for those whose confidence in their initial decisions is low than for those with higher confidence in their initial decisions.
5. High initial risk takers will be perceived by other members of their group to be more influential in discussion than low initial risk takers.

D. Summary

It was suggested that studies comparing information transmission and interacting conditions are of importance as such studies may be able to demonstrate whether group interaction per se is essential to the occurrence of risky-shifts as large as discussion-induced shifts. This, in turn, may simplify the search for possible causal mechanisms.

However, the possibility existed that a variable which may be of some importance in determining the magnitude of the risky-shift, publicity of initial decisions, had not been adequately controlled in these studies, with the possible result that larger risky-shifts were being ascribed to the action of information transmission than would be the case if this variable, presumed to stabilise decisions, were controlled. Therefore, it was proposed to investigate this variable employing eight conditions, familiarisation, information, listening and discussion each under public and private conditions. In this way it was possible to see if publicity of initial decisions did effect the magnitude of the risky-shift for each of these conditions and if this influenced the

conclusions as to the mechanism responsible for the risky-shift.

Other variables to be investigated were confidence in initial decisions and perceived influence in the discussion.

CHAPTER THREE

Experimental Design and Procedure*

A. General Design

A four by two factorial design was used to test the hypotheses outlined in the previous chapter. Familiarisation, information, listening and discussion conditions were investigated under what will be referred to as public and private conditions. Earlier, it was pointed out that the initial decisions of subjects in viewing and listening conditions as used by Wallach & Kogan (1967) and Lamm (1967) were not completely private as the subjects would anticipate that the experimenter (E) would see their answers at a later time. The same point applies to the private condition in this experiment. Although efforts were made to ensure that the initial decisions of the subjects were as private as possible, it must be assumed that they would anticipate that the E would see their decisions. Therefore complete privacy was not achieved. Thus while the difference between conditions in terms of publicity is one of high, contrasted with low publicity, these two levels of the publicity will be referred to as

* Table 3 summarises the design and also the procedure for each condition.

	<u>Private</u>			<u>Public</u>		
	I.D. & C.R.*	Experimental Manipulation	F.D. & C.R.+	I.D. & C.R.	Experimental Manipulation	F.D. & C.R.
Familiarisation.	✓	Subjects wrote points for and against the two alternatives in each problem.	✓	✓	As for familiarisation private, and in addition, subjects were led to believe that others knew their initial decisions.	✓
Information.	✓	As above, and subjects also received unnamed decisions made by other group members.	✓	✓	As for information private except that decisions were named.	✓
Listening.	✓	A copy of a problem was read and then a tape recording of a discussion of that problem by a group of the same sex was heard.	✓	✓	As for listening private, publicity as for familiarisation public.	✓
Discussion.	✓	Subjects discussed points for and against the two alternatives in each problem. Own decisions were concealed. Rankings of perceived influence were obtained.	✓	✓	Discussion without consensus during which subjects made their decisions public. Rankings of perceived influence were obtained.	✓

* Initial Decisions and Confidence Ratings

+ Final " " " "

TABLE THREE

A Summary Of The Experimental Design And Of The Procedure For Each Condition

public and private conditions respectively.

Following many previous experiments e.g. Wallach & Kogan (1965), Kogan & Wallach (1967), Lamm (1967), no control group was used. This was because studies which have used control groups have consistently shown no significant shift to risk or caution for such groups, e.g. Stoner (1961), Rim (1964), Bateson (1966), Flanders & Thistlethwaite (1967), Pruitt & Teger (1967).

B. Subjects

The subjects were 96 male and 96 female University of Canterbury students enrolled in introductory courses in psychology or sociology. Ages ranged from 17 years to 29 years, the mean age being 19.38 years. Subjects were randomly assigned to the eight conditions with twelve male and twelve female subjects in each condition. Although no difference has been found in the initial risk taking or risky-shifts of males and females, (e.g. Wallach, Kogan & Bem 1962) it was considered preferable to control for this factor. Thus three groups of four males and three groups of four females were used in each condition.

C. Experimental Setting

Subjects sat in individual cubicles arranged around the E.* Communication slots which could be opened from both the subjects and the E's side enabled material to be passed to and from the subjects. Except for the discussion groups, subjects did not leave these cubicles or communicate with each other during the experiment. Discussion groups on completion of their initial decisions and confidence ratings, were seated around a table for the discussion and when this terminated, returned to their individual cubicles to make their final decisions.

D. Stimulus Material

The twelve choice dilemmas devised by Wallach & Kogan (1959), and used in most of the studies investigating the risky-shift, formed the stimulus material. Some minor changes were made to the problems for the present study so that they would be more acceptable in terms of idiomatic content to New Zealand subjects. These problems and instructions explaining the decision making tasks were distributed to subjects in the form of a booklet entitled "Opinion Questionnaire."^{**} This booklet also included beneath each problem, the scale for the measurement

* See Appendix 5 for a diagram of this experimental setting.

** These instructions and all others to be mentioned are reproduced in full in Appendix 3, while the problems can be seen in Appendix 1.

of the subject's confidence in the decision made for that problem,

E. Responses

1. Initial Response

The response scale on which subjects indicated their initial decision for each problem can be seen following problem one, in Appendix 1. This scale followed each problem. Subjects merely placed a tick beside one of the statements on the space provided to indicate the lowest probability of success they would demand before recommending that the more risky alternative be chosen. They also had the option of refusing to recommend the risky alternative no matter what the probability of success.

2. The Confidence Measure^{*}

The confidence measure was obtained for each decision by asking subjects to place a tick on the scale beneath each problem to indicate approximately how sure they were that the decision made was the recommendation that should be given to the central figure. This scale ran from "not sure at all" at 0% to "extremely sure" at 100% and was marked off in 10% intervals.

^{*} See Appendix 2.

3. The Influence Measure*

The perceived influence of each individual in the discussion groups was measured in the same manner as that used by Wallach, Kogan & Bem (1962). Subjects were asked to rank each individual in the group (including themselves) in terms of how influential they were in the discussion, the most influential to be given a rank of one, and the least influential a rank of four.

F. Procedure

As has been mentioned, four subjects of the same sex were used in any one experimental session. To this writer's knowledge, only in the experiment by Jamieson (1968) have mixed sex groups been used. The size of subject groups has varied from two to six with groups of three, four or five being the most common.

When the four subjects had arrived outside the experimental room, they were introduced to one another as it was anticipated that the majority of subjects would not know the others in their groups and the decisions of subjects in some public conditions were later to be identified by name.

As soon as they were seated, subjects were handed

* See Appendix 2.

copies of the choice dilemmas. Subjects in the public conditions were asked to write their name and initials clearly on the front of the booklets while those in the private conditions were asked to write any three digit number on their booklets, so that they would be the only persons able to identify their own questionnaires. It was essential in most public conditions, for the purpose of later manipulations, that E be able to identify the decisions of each individual. However, as much privacy as possible was desired in the private condition and the use of code numbers was felt to emphasize this privacy in as much as was possible in the experiment. A pilot study revealed that initial decisions were no different for public and private conditions, so that it could be anticipated with some confidence that this procedure would not affect initial decisions.

1. Initial Decisions

The instructions for the making of initial decisions were identical for all subjects. When the booklets were appropriately labelled, subjects were asked to follow the instructions on their booklets as the E read them (see Appendix 3). These instructions described the nature of the two alternatives in each problem, one being more attractive but more risky than the other, and illustrated

this with an example written for this purpose. This example was also used to clarify the instructions explaining the subjects' decision making task. The written instructions concluded with the scale for obtaining confidence ratings and instructions for its use. Following this point, subjects were given the opportunity to ask questions about the instructions.* Following Wallach & Kogan (1965), certain further points were emphasised by E in standard instructions that were verbally communicated. These instructions further explained the more attractive nature of the risky alternative and the task to be carried out by the subjects. Once again, opportunity was given for questions and subjects were then asked to begin. No time limit was imposed but the instruction to "pass in your booklets as soon as you have finished the twelve problems" may have served to reduce the time slower subjects would otherwise have taken, as they could hear other subjects passing in their completed booklets.

2. Experimental Manipulations (See Appendix 3)

When all booklets were handed in, the instructions appropriate to the condition being run were distributed

* Questions were rare and of little apparent relevance to the experimental task per se e.g. do we do the example?

and read to the subjects. The order of conditions was randomly determined, the only constraint being that sufficient discussion groups preceded listening groups so that a tape of each discussion was used only once in the public and private listening conditions.

a) A note on the public/private manipulations

In the public conditions, except for the discussion public, the named initial decisions of each subject were distributed, or were supposedly distributed by E to the experimental group of which the subject was a part, so that each subject felt that his or her decisions were known by the group. In the discussion public groups, subjects make their decisions known to their group. In the private conditions, subjects' decisions were not known by the group. Thus a public decision is one which the subject feels is known by the experimental group of which he is a part, while a private decision is one which is not known to the group.

Maximum privacy was desired in the private conditions, and similarly, maximum publicity was wanted in the public conditions. However, some restrictions were imposed by the nature of the experiment on the type of publicity manipulation that could be used. Possibly a stronger publicity manipulation than having subjects feel that

others knew what decisions they had made would have been to have subjects call out their decisions for a particular problem when E called the subject's name. While this manipulation would have been suitable for the information public condition as it would have supplied the restricted information required by that condition, it would not have been suitable for the familiarisation public condition. It is essential that subjects do not know these decisions in the familiarisation conditions as they would then be information conditions. Therefore while this method could not be adapted to suit all conditions, the method used in this experiment was able to be used for all conditions. (This will be more fully explained when the procedure for each condition is considered.) It is obviously desirable that these public/private manipulations were as similar as possible for each mechanism so that meaningful comparisons between mechanisms could be made.

The procedure for each condition will now be described.

b) Familiarisation private

Subjects were asked to place themselves in the position of a counsellor attempting to make clear the advantages and disadvantages of each alternative in any particular problem, in an effort to assist the central figure in the problem to make a decision. This could be done e.g. by

listing pros and cons and was to be done for all twelve problems spending about five minutes on each. The rationale given was that psychologists when counselling, do attempt to clarify problems in this way and the experimenters were interested to see how well subjects could clarify the problems they had been given. This rationale was a useful one since it was able to be adapted to all conditions and so could be kept relatively constant. This has not always been the case. The Flanders & Thistlethwaite (1967) familiarisation condition rationale was to prepare for a group discussion while the discussion condition was supposedly to assist in the development of a human relations course.

Subjects were given one problem at a time and after about four minutes were asked to hand these in when they had completed writing. (By which time approximately five minutes had elapsed.) Thus the time spent reviewing the problems is very similar to the time spent discussing each problem in the discussion condition. Copies of the problems without response scales were provided, since in the pilot study subjects appeared to be more concerned with making a second decision rather than with the familiarisation process, despite instructions to the

contrary. Thus copies of the problems without the response scale were used for all conditions for this stage of the experiment.

c) Familiarisation public

Instructions conveyed the same information to this condition as to the above and also included instructions for the publicity manipulation. 'Since information about others' decisions could not be given to subjects in this condition as this would then become an information condition, subjects had to be given the impression that others knew what decisions they had made without actually doing this. To this end, subjects were told that all twelve decisions made by one of them would be distributed to the rest of the group. When the copy of the first problem to be reviewed was handed to the subjects, three of them would also receive the fourth members named decision for that problem while this person would not receive a decision, and so on for the twelve problems. It was anticipated that by not distributing any decisions, each subject would receive the impression that he was the "fourth person" and that his twelve decisions would be known to the others. Retrospective reports from subjects indicated that this was indeed the case. The

manipulation was assisted by attaching to each problem, the form on which these decisions were supposedly being publicised. This contained a space where E supposedly wrote the decision maker's name and decision. Before the first problem was given to the subject at the beginning of the familiarisation procedure, E put a line through this space and a hand written note which indicated to the subject that his twelve decisions were to be distributed to the rest of the group.

Thus this procedure made each subject feel that his decisions were known to the rest of the group and yet the condition was still retained as a familiarisation condition.

d) Information public and private

As has already been discussed, the restricted information conditions used in previous experiments (Wallach & Kogan 1965, Teger & Pruitt 1967) have in fact been information and familiarisation conditions. The information condition used in this experiment therefore made this familiarisation explicit. Other changes were also made in an attempt to correct the other possible faults associated with previous information conditions that were mentioned in the previous chapter.

The two components of an information condition, familiarisation* and restricted information, were incorporated into the information condition of this study in the following way. Subjects were given familiarisation instructions as for that condition, and in addition were told that they would receive the decisions made by the other members of the group. For the information private condition, decisions were unnamed and it was emphasised that the decisions of any one subject could not be identified by the rest of the group, while in the information public condition, decisions were named and it was emphasised that everyone in the group would know what decisions others had made. Subjects were instructed to compare these decisions with their own and then to carry out the familiarisation procedure, bearing these decisions in mind as consideration of possible reasons leading to these decisions may stimulate new ideas.

Thus the requirements of Brown's value mechanism were met. Subjects were able to see if they were satisfying the value of risk. In addition, the familiarisation which will occur in any information condition was used to advantage here, in that this allowed about five minutes to

* It would appear to be impossible to have an information condition without familiarisation taking place since even if subjects did not have the opportunity to refer to copies of the problems, the provision of restricted information would surely cause the subjects to reconsider the problems. Therefore, some familiarisation would occur.

be spent on each problem at this stage of the experiment as it was in all other conditions.

e) Listening private

Instructions indicated that the group was to hear a tape recording of a discussion by another group of Canterbury students, of the same twelve problems that had just been considered. The subjects were told that the experimenters would later be interested to know if those listening to the discussion of a diversity of opinions thought that it served to clarify the advantages and disadvantages of the two alternatives in each problem.

A copy of the problem was passed to each subject, and time was allowed for this to be read before beginning the tape recording of the discussion of each problem. Female listening groups heard discussions by females, males heard discussions by males. Subjects remained in their cubicles so that possible additional information cues in the form of reactions by the rest of the listening group to points made in the discussion, were not available to the subjects.

The discussions heard were discussion without consensus to minimise the likelihood that subjects would feel they were supposed to move to some particular decision.

Also Kogan & Wallach (1967) used discussion without consensus, while Lamm (1967) used both discussion with and without consensus. Thus comparisons with these studies can be made more readily with the use of discussion without consensus. Each discussion was used once so that information was the same for listening and discussion conditions.

f) Listening public

The same instructions, procedure and tape recordings as for listening private groups were used but with some additional instructions for the publicity manipulation. The publicity manipulation was the same as that used for the familiarisation public condition since it was considered essential that the only information received by subjects should be that contained in the discussion. In this way, the information received by both listening conditions was the same, whereas had publicity been achieved by actually distributing decisions, listening public subjects would have received more information than listening private. The communication of the "fourth person's" decisions to the rest of the group was supposedly accomplished when the copy of the problem next to be discussed was passed to each subject. Once again, the manipulation

was assisted by the addition of the form on which decisions were supposedly publicised. Thus listening public and private conditions received identical information since the same discussions were heard by each condition.

g) Discussion private

At first sight this condition appears impossible but in terms of the definition of public and private used in this experiment, such a condition is possible since providing the initial decisions of a subject are not known to the group they are private.

Following initial decisions, subjects were grouped about a table, given new copies of the problems and were asked to discuss the advantages and disadvantages of the two alternatives in each problem without being influenced by the decisions they had made and without mentioning or implying what decision they had made. The rationale was that counsellors attempt to assist clients to make decisions by investigating the alternatives available but want the client to make his own decision. Consequently they do not want the client to know what decision they (the counsellors) would make themselves. In effect the subjects were asked to role play as neutral advisers. Thus the subjects were told, that the experimenters were

interested to see how well a group could discuss the advantages and disadvantages of the two alternatives in each problem without revealing their own decisions. A tape recording of the discussion was being taken so that E could later replay it to see how well they had accomplished this objective. (This of course was one reason for the tape recording, the other being to keep this factor equal for both discussion conditions.)

h) Discussion public

As in the discussion private condition, subjects were grouped about a table and given new copies of the problems and instructions which they followed as E read them. The subjects were told that they had completed the questionnaire to familiarise themselves with all the situations it contained, the real purpose of the experiment being to have them discuss the situations as a group. The rationale was that the experimenters were interested to see if such a discussion would serve to clarify the nature of the problems to a listener. For this purpose the instructions continued, a tape recording of the discussion was being taken so that the experimenters could later hear the discussion again. Kogan & Wallach (1967) and Lamm (1967) had taken tape recordings

of group discussions and still obtained the risky-shift so the use of a tape recorder in this experiment was not expected to effect the discussion-induced shift.

No publicity manipulation was required of course, as subjects during the discussion voluntarily make their decisions public. In all cases this in fact occurred.

Thus, as in all other experiments, the discussion was completely unrestricted, so that it can be assumed that it took the same form as in other experiments.

3. Final Decisions

The instructions for final decisions were the same for all conditions, subjects being asked to go back over each problem and make further decisions and confidence ratings. The instructions emphasised that subjects were free to change their decisions, but that if they wished to make the same decision again, that was entirely satisfactory. Thus every effort was made to ensure that subjects did not feel obliged to change their decisions.

G. A Note on the Instructions

While parts of the instructions used are similar to those in some previous experiments e.g. instructions for initial and final decisions are similar to those of Wallach & Kogan (1965), any suggestion that subjects were

expected to change their decisions is strictly avoided. Wallach & Kogan (1965) for example, as part of their instructions for final decisions, told subjects that the purpose of the discussion was to see how much diversity of opinion was generated by each situation. They go on, "obviously, the expression of such diversity should have some impact on everyone's personal opinions."

Such statements and others such as the following used by Teger & Pruitt (1967) for their information condition, possibly exercise additional pressures to change as well as those induced by the experimental manipulation. Teger & Pruitt as part of the instructions to their information condition said, "Remember, if this were the usual form of discussion, many of you would change your answers for various reasons during the course of the discussion. Always consider your own decision in the light of other's decisions, but in the end do whatever you think is best."

Thus instructions emphasising change and such phrases as "in the light of" were avoided in the instructions used in this experiment.

H. Summary^{*}

The influence of four experimental manipulations, familiarisation, information, listening and discussion, on decisions made for the twelve Wallach & Kogan (1959) choice dilemma problems, was investigated under both public and private conditions, a four by two design being used. Twenty four University of Canterbury students, twelve males and twelve females in single sex groups of four, were used in each of the eight conditions. Following the making of initial individual decisions and confidence ratings for the twelve dilemmas, subjects experienced the manipulation appropriate to the condition being run, i.e. familiarisation, information, listening or discussion, under either public or private conditions. The initial decisions of subjects in private conditions were not known to the other subjects in their group, while those of subjects in public conditions were either known to other group members (information public and discussion public) or E led the subjects to believe that their decisions were known to their group (familiarisation public and listening public). Following the experimental manipulations, subjects made final individual decisions and confidence ratings for the twelve dilemmas. Those in the discussion conditions

* Table 3 summarises the design and also the procedure for each condition.

then ranked each subject, including themselves, in terms of perceived influence in the discussion. The experiment then concluded.

CHAPTER FOUR

Results

In the analysis of results, an individual's risk taking score for initial decisions is the average of the decisions made for the twelve problems. An individual's shift score is the sum of the shifts for the twelve problems, the shift for any one problem being the final decision minus the initial decision for that problem. Hence a risky-shift is denoted by a negative number.

Other measure used will be explained in conjunction with the results with which they are associated.

A. Initial Decisions

A two way analysis of variance (mechanisms by public/private) comparing the mean initial decisions for each condition was used to check that the eight conditions were initially equal in their risk taking positions. (The test for homogeneity of variance did not reach statistical significance.) The use of the two way analysis also allows the check to be made that there were no initial public/private differences. The analysis resulted in no significant F ratios for either of the main effects or for the interaction.

Thus the random sampling procedure was successful.

No condition was different from any other in initial risk taking and neither were public conditions different to private, nor are any of the four mechanism conditions different to any other.

B. The Risky-Shift

Table 4 presents the mean risky-shifts and standard deviations for each condition and also t values for evaluating whether each of the mean shifts was significantly different from zero. It can be seen that while all but two conditions, familiarisation public and discussion private, shifted in a risky direction, only three of these reached statistical significance - listening public and private and discussion public. Thus, hypothesis one, that a risky-shift will occur for discussion public and listening private conditions, can be accepted. In addition, it has been found that a significant risky-shift has occurred for the listening public condition.

C. Stability Of Initial Decisions

The measure of stability of initial decisions used for each individual was the number of decisions that were changed at the final decision. The figures in table 5 represent the average of these individual measures for each

Table 4Mean Risky-Shifts, Standard Deviations and t Values

	Public			Private		
	$\bar{x}$	s	t	$\bar{x}$	s	t
Familiarisation	0.88	7.72	0.55	-2.25	8.67	1.25
Information	-0.79	6.72	0.60	-1.96	6.61	1.03
Listening	-3.5	6.98	2.41*	-4.63	8.49	2.61**
Discussion	-6.25	9.13	3.29***	1.21	5.82	1.00

Negative sign denotes a risky-shift

* $p < 0.05$ two tailed

** $p < 0.02$ " "

*** $p < 0.01$ " "

condition. Table 6 is a summary of the two way analysis of variance for the data of table 5 (F max not significant). The F ratios for both of the main effects reach statistical significance but that for the interaction does not.

Thus hypothesis two has been supported. Fewer decisions are changed in public than in private conditions. In addition the F ratio for mechanisms is significant; most shifting occurs in the discussion conditions, followed by familiarisation, listening and information.

D. Risky-Shifts Compared

It was expected that less changing of decisions in some conditions than others as shown above would be reflected in corresponding differences in risky-shifts. Table 4 clearly shows that there were differences in the shifts induced by different conditions, with these differences tending to be in the predicted directions. Except for discussion private, shifts were greater in private than in public conditions. In addition, risky-shifts tended to increase from small shifts for familiarisation and information conditions to greater shifts for listening conditions and for discussion public. However, a two way analysis of variance (Table 7) of the data in Table 4 (F max not significant) showed that only the F

Table 5Number of decisions changed - means and standard deviations

	Public		Private	
	$\bar{x}$	s	$\bar{x}$	s
Familiarisation	5.17	2.30	5.96	1.84
Information	4.25	2.09	5.17	1.95
Listening	4.75	1.20	5.04	2.61
Discussion	5.63	1.65	6.08	1.87

Table 6Summary of analysis of variance for data in table 5

Source	df	MS	F
Mechanisms (A)	3	14.10	3.25*
Public/Private (B)	1	18.13	4.18*
A x B	3	1.01	0.23
Error	184	4.34	
Total	191		

* $p < 0.05$

ratio for the interaction reached statistical significance. Thus although differences in risky-shifts between public and private conditions tend to be as predicted and although publicity of initial decisions has been shown to stabilise these decisions, the data did not support hypothesis three that risky-shifts would be greater when initial decisions remained private than when they had been made public. Neither do the differences in the risky-shifts of familiarisation, information, listening and discussion conditions reach statistical significance.

Since the interaction was significant however, pairs of conditions were investigated to discover which were significantly different. Table 8 presents only those comparisons that were significantly different. Other comparisons which approached statistical significance were the following. Discussion public greater than familiarisation private ($F = 3.23^*$); discussion public greater than information private ($F = 3.72^*$); listening public greater than familiarisation public ($F = 3.86^*$).

E. Confidence

An individual's confidence score for the initial decisions was the average of the confidence ratings for the twelve decisions. The measure of change in confidence

* F must exceed 3.91 to be significant at the 5% level.

Table 7Summary of analysis of variance for data in table 4

Source	df	MS	F
Mechanisms (A)	3	104.55	1.76
Public/Private (B)	1	12.51	0.21
A X B	3	267.91	4.51*
Error	184	59.42	
Total	191		

* $p < 0.01$ Table 8Pairs of conditions for which risky-shifts were significantly different

	F
Discussion public > Familiarisation public	10.28**
" " > Information public	6.02*
" " > Discussion private	11.23**
Listening private > Familiarisation public	6.11*
" " > Discussion private	6.87**
" public > " "	4.48*

* $p < 0.05$ ** $p < 0.01$

from initial to final decisions for each individual was the sum of the changes in confidence over the twelve decisions.

1. Initial Confidence

As for the initial risk decisions, the random sampling should have resulted in eight conditions equal in initial confidence. F max did not reach the critical level so a two way analysis of variance (mechanisms by public/private) of confidence ratings was carried out. None of the F ratios obtained reached a significant level. Thus there were no differences in the confidence with which initial decisions were made.

2. Confidence and Initial Risk Taking

A Pearson Product Moment Correlation Coefficient was calculated to investigate the relationship between riskiness of initial decisions and confidence. The correlation was $-.03$ and was not significant. Thus higher or lower initial risk taking is not accompanied by higher or lower confidence in these decisions.

3. Confidence and the Risky-Shift

Did those below the mean confidence level for initial decisions exhibit greater risky-shifts than those above the mean? Table 9 presents the mean risky-shifts and

* The mean confidence level for all conditions was 71.16.

standard deviations for groups split at the mean confidence level. The number of subjects in each category and the t value for determining whether the two risky-shifts are significantly different are also presented.

Table 9

	Below $\bar{x}$	Above $\bar{x}$	t
$\bar{x}$ Risky-shift	-2.7	-1.6	0.96
s	8.81	6.83	
N	98	94	

While those below the mean did shift further to risk than those above the mean, this difference was not significant. Since the difference was in the predicted direction however, a further comparison was made. An extreme groups analysis was undertaken. The risky-shifts of those more than one standard deviation below and those more than one standard deviation above the mean confidence level were compared. Table 10 presents the relevant data and it can be seen that the difference in risky-shifts for the two groups reaches statistical significance. This gives some support to hypothesis four, that those with lower confidence in their initial decisions would shift

further to risk than those with higher confidence in their initial decisions.

Table 10

	Below 59.34	Above 82.98	t
$\bar{x}$ Risky-shift	-5.3	-1.32	2.3*
s	8.29	5.95	
N	33	37	

* $p < 0.05$ two tails.

This analysis includes all eight conditions of which only three shifted significantly to risk. It would be expected that the above finding of a greater risky-shift by the less confident would be more firmly supported if this relationship was investigated only for those conditions that did shift significantly to risk. The above two types of analysis were therefore carried out for the public and private listening conditions and for discussion public. This time a significant difference was found for the mean split. The data are presented in Table 11.

Table 11

	Below $\bar{x}$	Above $\bar{x}$	t
$\bar{x}$ Risky-shift	-6.25	-2.97	1.68*
s	8.54	7.66	
N	40	32	

* $p < .05$ one tail.

Thus, consideration of those conditions that shift significantly to risk offers stronger support for hypothesis four - an extreme groups analysis is not required to demonstrate the difference in risky-shifts of high and low confidence groups. However a one tail* test is required to achieve statistical significance so an extreme groups analysis was also carried out with these three groups. The results in Table 12 show that hypothesis 4 is given additional support.

Table 12

	Below 60.09	Above 82.35	t
$\bar{x}$ Risky-shift	-10.15	-0.86	3.57*
s	7.42	5.49	
N	13	14	

* $p < .01$ two tails.

* A one tail test was permissible since it was predicted that high confidence subjects would shift to risk less than low confidence subjects.

4. Shifts in Confidence

An examination of the raw data suggested that final decisions were accompanied by higher confidence ratings than initial decisions. While there appeared to be no differences between conditions in the magnitude of this change, a two way analysis of variance (F max, not significant) was carried out to investigate this possibility. However, neither the F ratio for the main effects nor the interaction approached statistical significance.

Since there was no difference in changes in confidence between conditions, the data from all eight conditions was pooled and a t test revealed that the move to greater confidence was significant at the .001 level (two tailed).

F. Influence

The four rank order positions assigned to one individual were summed to obtain his perceived influence score. Thus the highest influence is indicated by a score of 4, lowest influence by 16.

1. Influence and Risk Taking

A Pearson product moment correlation of mean initial risk taking and influence for the public discussion

condition resulted in a correlation coefficient of .134. This correlation was in the expected direction i.e. greater risk taking, greater influence, but did not approach statistical significance. Thus hypothesis five was not supported.

This correlation was also calculated for the private discussion condition, r being $-.025$ and not significant.

2. Influence and Confidence

Influence scores were correlated with mean confidence for initial decisions for both the public and private discussion conditions. For the public discussion condition r was $-.33$ and for the private condition, $.12$. The correlation for the public condition was in the direction which could well be expected i.e. more confidence, more influence. (The correlation is negative since high influence is associated with low influence scores while high confidence is associated with high confidence scores). However this correlation did not reach statistical significance.

G. Summary

1. Hypothesis one, that a risky-shift would occur for the discussion public and listening private conditions, was supported.
2. The second hypothesis predicted that fewer initial decisions would be changed when they had been made public, than when they had remained private. This hypothesis was supported.
3. Hypothesis three could not be supported. Except for the discussion condition, smaller risky-shifts did occur within each condition when initial decisions had been made public than when they had remained private, but these differences did not reach statistical significance.
4. Hypothesis four did receive considerable support. While a mean confidence split for initial decisions for all conditions did not result in a significant difference for the risky-shifts of these two groups, an extreme groups analysis did support the hypothesis that subjects with higher confidence in their initial decisions would shift to risk less than those who had less confidence in their initial decisions. This result was further supported by a mean split and an extreme groups analysis for those three conditions that did shift significantly to risk as

both of these analysis supported the hypothesis.

5. No support can be given to hypothesis five. High initial risk takers were not perceived by other members of their group to be more influential in discussion than low initial risk takers for either the discussion public or private conditions.

6. Results other than those relevant to the hypotheses were as follows.

a) A two way analysis of variance of initial decisions showed that there were no differences between conditions in initial risk taking.

b) The same result was obtained for a two way analysis of variance of confidence in initial decisions.

c) The greatest number of decisions were changed in the discussion conditions, followed by familiarisation, listening and information conditions.

d) The F ratio for mechanisms in the two way analysis of variance did not reach statistical significance.

e) The interaction for the two way analysis of variance of risky-shifts was significant. Pairs of conditions were therefore compared with six differences reaching statistical significance.

f) No relationship was found between confidence and initial

risk taking.

g) A significant shift to greater confidence from initial to final decisions was found with no differences between conditions in the magnitude of this shift.

h) Confidence in initial decisions was found to be positively correlated with rankings of influence, more confidence, more influence, for discussion public but the correlation was not significant. The correlation for discussion private was in the opposite direction but was small and not significant.

CHAPTER FIVE

Discussion

A. The Random Sampling

Of primary importance is the success of the random sampling in ensuring that there were no differences in initial risk taking positions for the eight conditions. The analysis of variance of initial decisions showed that the random sampling procedure was successful. Thus any differences between conditions in the riskiness of final decisions can be ascribed to the effect of experimental manipulations and not to initial differences in risk taking.

In addition to the initial decisions, there was no difference between conditions in the confidence with which initial decisions were made. This offers further assurance that the eight conditions were initially equal.

B. Which Conditions Shift to Risk?

In this section the shift for each condition will be examined in order to see to what extent previous research has been supported. Comparisons between conditions will be disregarded until a later section.

1. Discussion Public

No study has been reported which has failed to find

a discussion-induced risky-shift when the stimulus material has been the Wallach & Kogan choice dilemmas. While most studies have been conducted in the U.S., there is sufficient data, as has been shown in the literature review, to demonstrate that the discussion-induced shift is not limited to that culture e.g. Rim (1964, 1966) in Israel, and more particularly, Jamieson (1968) in New Zealand. Thus the finding of such a risky-shift in this experiment was no surprise. By comparison with some other experiments the average discussion-induced risky-shift per individual of 6.25 found in this experiment is not large, other studies having reported larger risky-shifts e.g. Kogan & Wallach (1967). However smaller risky-shifts for discussion conditions have also been obtained e.g. Wallach & Kogan (1965). Thus the magnitude of the risky-shift varies considerably from experiment to experiment so that the discussion-induced risky-shift in this experiment, especially since it is highly significant ($p < 0.01$), clearly supports similar previous findings for the choice dilemmas.

The magnitude of the shifts for each problem are presented in Appendix 4. These shifts can be compared with the table of norms of Pruitt & Teger (1967) which were based on studies by Wallach & Kogan (1961); Wallach,

Kogan & Bem (1962); Stoner (1961); Teger & Pruitt (1967); Flanders & Thistlethwaite (1967) and other unpublished studies carried out by Pruitt & Teger in Buffalo. These norms are also given in Appendix 4. The magnitude of the shifts for each problem in this experiment are considerably different to those in the Pruitt & Teger norms. Indeed a rank order correlation coefficient is not significant ($\rho = +.446$). However a rank order correlation coefficient of initial decisions for the two sets of norms yields a highly significant ($p < .01$) correlation coefficient of $+ .93$. Thus although initial decisions are highly similar, the magnitude of the risky-shift for each problem may not be similar across cultures. Of course the shift values are based on only the discussion public condition, a sample of 24 subjects, while the figures for initial decisions are based on all conditions, a sample of 192. Thus the difference in similarity of initial decisions and risky-shifts in this study to those of the Pruitt & Teger norms may be partially a function of the smaller sample from which the risky-shift figures in the present study are obtained. It is of interest however, to note that a cautious shift has occurred for problem 12 as has usually been the case e.g. Teger & Pruitt (1967), Wallach, Kogan & Bem (1967), but not for problem 5

which has also typically shifted to caution in previous studies. The reason for the absence of a cautious shift for problem 5 is not readily apparent. It has been suggested that the cautious shift typically found for this problem is due to recent heavy losses in overseas investments by some U.S. Companies. If this were the reason, it is not surprising that no cautious shift was found in this study for problem 5. The cautious shift for problem 2 may possibly be related to the recent heart transplant operations, this study being carried out after the advent of these operations.

Thus while the risky-shifts induced by discussion in this study are somewhat different for each item than for the shifts of the Teger & Pruitt norms, a significant risky-shift of considerable magnitude has occurred for the choice dilemmas, clearly supporting previous findings demonstrating the individual's willingness to accept a lower probability of success following group discussion. It is important to note however, that two problems have shifted to caution so that this shift must be explained as well as the risky-shift.

2. Listening

In addition to discussion public, two other conditions

shifted significantly to risk - listening public and private. Kogan & Wallach (1967) and Lamm (1967) have both obtained risky-shifts for listening conditions and the results of this experiment clearly support their findings.

Therefore, some support can be given to Brown's (1965) value and information interpretation. Listening to the discussion of the choice dilemmas and hearing what risks others are taking and the reasons for these decisions does cause a risky-shift.

The ability of Brown's interpretation to explain the risky-shift will be considered when the risky-shifts of the listening conditions are compared with that of the discussion public condition.

3. Familiarisation

The finding by Bateson (1966) and Flanders & Thistlethwaite (1967) of a significant risky-shift as a result of familiarisation with the choice dilemmas has not been supported. Rather, the results agree with those of Pruitt & Teger (1967) who, in six experiments, found no support for Bateson. While a non-significant risky-shift occurred for familiarisation private, familiarisation public shifted in a cautious direction, although this shift was small and not significant. Thus neither of the

familiarisation conditions provide support for this interpretation.

Both of the information conditions and also the discussion private condition supply evidence which supports the above finding of the absence of a significant risky-shift as a result of familiarisation. Subjects in the information conditions also experienced the familiarisation procedure and while these conditions did shift in a risky direction, the shift is small and not significant.

Familiarisation is clearly one of the components of the discussion private condition. Subjects in this condition are not limited to reviewing the problems individually as in the familiarisation and information conditions, but the views of other subjects are also heard as the advantages and disadvantages of the two alternatives in each problem are discussed. Thus the familiarisation occurring in the discussion private condition would appear to more closely approximate that which occurs in the discussion public condition. In spite of this, the discussion private condition did not shift to risk - in fact a non-significant cautious shift occurred. This evidence is certainly not favourable to a familiarisation interpretation.

Thus a substantial body of evidence strongly suggests that familiarisation does not induce a risky-shift of

other than minimal size. It must be concluded with Pruitt & Teger (1967) that "a judgement of "not proven" must be recorded against the hypothesis that familiarisation produces a risky-shift and, hence against the conclusion that the risky-shift produced by group discussion is due to familiarisation."

4. Information

The information conditions have fared little better than the familiarisation. Although both conditions have shifted in a risky direction, these shifts are small and neither is statistically significant. Thus very little support can be given to Brown's (1965) suggestion that acquaintance with the decisions made by others will induce a risky-shift. The results of this experiment suggest that any such shift will be extremely small. This conclusion, while agreeing with the results of the Wallach & Kogan (1965) study, is contrary to those of Teger & Pruitt (1967) who obtained a significant risky-shift for their information condition. However, as was mentioned earlier, the effort to induce a change in decisions was possibly more explicit in that condition than in the procedure used in this experiment. In addition, the result may have been due to the give-and-take of the balloting procedure rather than to the information transmission. These faults have been avoided in this experiment but the requirements of Brown's value

mechanism were still met. Subjects were acquainted with the decisions made by others and so had the opportunity, by comparing their decisions with those of others, to judge the riskiness of their decisions. As a result, some would have found that their decisions were more cautious than those of others and so, according to the value interpretation, should have shifted to risk. However, the absence of other than an extremely small risky-shift for these information conditions clearly demonstrates the inability of this explanation to explain the risky-shift.

5. Discussion Private

A number of conclusions can be drawn from the finding of a non-significant shift to caution for this condition, those relevant to familiarisation having already been discussed.

First, this finding does suggest that the instructions requesting that personal decisions be kept private were successful. If this had not occurred and decisions had been made public, a risky-shift of similar magnitude to the discussion public condition would have been expected. In fact, the shifts of these two conditions are significantly different ($p < .01$). This is not the only evidence bearing on the success of the manipulation. Only

on very few occasions did E feel that a subject had revealed his decision either explicitly or implicitly and on no occasion did a subject announce what specific probability he had chosen. In addition, retrospective reports from subjects indicated that they felt that their decisions were private.

However, unlike the other conditions, public and private discussion conditions cannot be compared to examine the effect of the publicity of the decisions. By eliminating the discussion of decisions, the nature of the discussion has been considerably altered. There is no opportunity for the value and information mechanism to operate as decisions are not made public so that subjects cannot learn what is considered to be a risky decision. However, there appears to be little reason to suspect that the conditions required for diffusion of responsibility have not been met. The face-to-face discussion should allow the formation of affective bonds among group members and it is this which supposedly leads to responsibility diffusion (Wallach, Kogan & Burt 1967). However, since this condition has not shifted to risk, a responsibility diffusion mechanism is not supported.

Pruitt & Teger (1967) tested this interpretation

by having subjects discuss items not relevant to risk taking between the making of initial and post discussion decisions for gambling items. They argued that this group experience satisfied the requirements for diffusion of responsibility. However, a risky-shift did not occur.

The discussion occurring in the discussion private condition in this experiment would appear to be more favourable to the operation of responsibility diffusion as subjects do discuss the choice dilemmas rather than filler items. Since this condition has not shifted to risk however, a responsibility diffusion explanation is not supported. Nevertheless, Wallach & Kogan may have a reply to this finding. It was pointed out in the literature review that Kogan (personal communication to Teger & Pruitt 1967) argued against the above Pruitt & Teger finding by saying that diffusion of responsibility only occurs if the individual receives information about the level of risk that other group members are taking. The reply of Pruitt & Teger would apply here. "If that is what diffusion of responsibility theory implies, we will agree that our experiment did not provide a test of that theory, but it does suggest that the theory should be restated."

C. Public/Private Differences

The rationale for the importance of the publicity of initial decisions for the risky-shift was that this publicity would render decisions more resistant to change so that subjects in public conditions should change fewer decisions than those in private conditions. The analysis of the number of decisions changed did support hypothesis two. Fewer decisions were changed in public than in private conditions. Thus the public/private manipulations have been effective, to this extent at least, as publicity has stabilised initial decisions.

Given that in private conditions more decisions are changed than in public conditions, is this difference reflected in the magnitude of the risky-shifts? From an examination of table (4)², it can be seen that for every condition, except discussion, the differences in the magnitude of the risky-shifts were in the predicted direction. Private conditions did shift further to risk than their public counterparts. However the analysis of variance for these risky-shifts did not result in a significant public/private difference, even although the private familiarisation, information and listening conditions did shift further to risk than these conditions

with initial decisions public. (Neither was a significant difference obtained for a two way analysis of variance for these six conditions where the differences were in the predicted direction).

Comparisons between pairs of conditions to investigate the significant interaction that was found in the analysis of variance of risky-shifts presented in Chapter four, revealed that only one of the mechanisms, discussion, showed a significant public/private difference. It has previously been explained that these two conditions do not differ only in terms of the relative publicity of decisions so that this difference cannot be attributed solely to this variable.

Thus while differences in the risky-shifts for public and private conditions are in the predicted direction, hypothesis three, that smaller risky-shifts will occur in public than in private conditions, cannot be accepted.

However, the fact that differences are in the predicted direction and also that the publicity of initial decisions has been shown to result in fewer decisions being changed, does suggest that control of the publicity variable may be of considerable importance.

The extent to which failure to control for this

variable may effect the conclusions as to the mechanisms responsible for the risky-shift will be considered in the next section.

D. Mechanisms

The analysis of the number of decisions changed resulted in a significant F ratio for mechanisms as well as for the public/private factor. An examination of Table five indicates that the greatest amount of shifting occurred in the discussion conditions followed by familiarisation, listening and information conditions. Consideration of the shifts to risk or caution in each condition has shown that some conditions shift significantly to risk while others do not, but a comparison of the magnitude of these shifts has not yet been undertaken. To what extent are the differences in the number of decisions changed reflected in differences in risky-shifts for each mechanism?

The analysis of variance of risky-shifts summarised in Table seven in which no significant F ratio for the public/private factor was found, also failed to result in a significant F ratio for mechanisms, although the magnitude of shifts induced by each condition fell in the expected order. Discussion public has induced the

greatest shift, followed by listening, information and familiarisation.

However, the comparison of pairs of conditions, since a significant interaction was found, does result in some significant differences of interest. Those differences that are significant are presented in Table eight. Consideration will now be given to those comparisons for which the risky-shifts were significantly different and also to those which were not.*

1. Familiarisation

The risky-shift for familiarisation public is significantly less than that for discussion public whereas this is not the case for familiarisation private. The difference in the magnitude of the risky-shifts for familiarisation private and discussion public is considerable however, and a significant difference would probably have occurred had a larger sample been used, statistical significance almost being reached in this experiment. However, since in this experiment this difference is not significant whereas that between familiarisation public and discussion public is significant, it is of interest to consider the importance of the control of the publicity variable suggested by this result. On the basis of the

* Most comparisons will be of discussion public with other conditions since the major interest is the extent to which other conditions contribute to the discussion-induced shift.

evidence presented above, and remembering that public conditions do change fewer decisions than private conditions, it would appear to be possible to draw incorrect conclusions concerning the contribution of familiarisation to the risky-shift if only a familiarisation private condition is used (as was done by Bateson 1966 and Flanders & Thistlethwaite 1967). This conclusion may be that the risky-shift induced by familiarisation is not significantly different to the discussion-induced shift and that it does (if the shift for familiarisation was greater than in this experiment) account for a considerable portion of the risky-shift. However, the evidence suggests that if publicity of the initial decisions is controlled, the difference between the shifts induced by familiarisation and discussion may be significantly different, leading to the conclusion that familiarisation explains little of the shift. Thus the finding of a significant difference in the risky-shifts of discussion and familiarisation conditions, but only when publicity of initial decisions is controlled, does offer some support for the suggestion that publicity of the initial decisions is a variable which should be controlled.

As was earlier mentioned, the familiarisation conditions do not shift significantly to risk and by

comparison with the discussion-induced shifts, the familiarisation shifts are very small. Hence not only is Bateson's (1966) conclusion that familiarisation is sufficient to explain the risky-shift not supported, but it must be concluded on the basis of the evidence in this experiment, that familiarisation induced shifts are minimal and contribute little to the risky-shift.

2. Information

The information conditions bear the same relation to discussion public as do the familiarisation conditions. The risky-shift for information public is significantly less than that of discussion public, while this is not the case for information private. However, this difference almost reaches statistical significance, and once again, a larger sample would probably have resulted in a significant difference. The same argument for the importance of the control of the publicity variable can be formulated from this data as for the familiarisation conditions. Without control of publicity it would appear to be possible to draw erroneous conclusions concerning the contribution of information to the risky-shift.

However, in this experiment, shifts by both information conditions are extremely small and, as for familiarisation, appear to explain little, if any of the risky-shift.

Indeed, the risky-shift for these two conditions may be more parsimoniously explained by familiarisation since there is little difference in the risky-shifts of these conditions.

In the earlier section concerned with the significance of the risky-shifts in each condition, it was concluded that Brown's (1965) value mechanism could not be supported. Not only is this conclusion based on the lack of a significant risky-shift for the information conditions, but a comparison of the risky-shifts for the information and discussion public conditions clearly indicates its minimal importance.

In Chapter two it was pointed out that the relation of the risky-shifts induced by restricted information and by unrestricted information was in some doubt. Little doubt now remains as differences between information and listening conditions are considerable. Indeed information public does shift significantly less than listening private and is almost significantly different to listening public while differences between information private and the listening conditions are also considerable although not significant. Thus while listening does result in significant shifts to risk, information-induced shifts are extremely small. Clearly the additional information

provided by listening to the discussion rather than simple acquaintance with others' decisions, is of considerable importance. Restricted information induces only an extremely small risky-shift but this information coupled with listening to the discussion does induce a significant risky-shift. Therefore, the difference between the risky-shifts induced by restricted and unrestricted information which was somewhat tentatively suggested by between study comparisons has been firmly supported in this study.

3. Listening

The conclusions which can be drawn from a comparison of the risky-shifts of the listening and discussion conditions are of considerable interest. Both listening conditions shifted significantly to risk and while neither of these shifts was significantly less than the discussion-induced shift, the differences were considerable. Thus these results are similar to those of Kogan & Wallach (1967) and Lamm (1967) who also found smaller shifts for listening than for discussion conditions. Listening and discussion-induced shifts were significantly different in the former study but not in the latter, although as in the present study, the difference was considerable.

The difference is particularly marked in this study

when listening public is compared with discussion public, the difference being larger in this case than for the listening private, discussion public comparison. This was the expected result. Control of the publicity variable therefore, results in less support for the value and information explanation than is the case without control of this variable. Thus, while the significant risky-shift for listening conditions does lend some support to the value and information explanation, the difference between the risky-shifts of listening and discussion conditions, particularly when the publicity of the initial decisions is controlled, clearly indicates its inability to explain all of the shift which occurs in the discussion groups.

This difference between listening and discussion-induced shifts suggests that group interaction is of considerable importance. Such a conclusion does not suggest however, that the responsibility diffusion explanation is supported, although neither can it be refuted. Rather, the reason for the apparent importance of group interaction per se, is a matter for speculation. The possibility cannot be excluded however, that it is of importance because it allows responsibility diffusion to occur. On the other hand, as Pruitt & Teger (1967)

suggested when discussing proposed explanations of the risky-shift, perhaps what is required is a new idea.

This writer suggests that this new idea, which presumably would attempt to explain that portion of the risky-shift not explained by value and information, may be found if an examination of the nature of the group interaction was undertaken. If this is analysed, its apparent importance for the risky-shift may also become clear.

E. Confidence

The findings in this study for confidence support some previous results and disagree with others. The lack of a relationship between initial risk taking and confidence agrees with the findings of Stoner (1961) and Teger & Pruitt (1967). Thus high risk takers do not rate themselves as more confident or vice versa. However, the result that those low in confidence shift further to risk than those high in confidence is contrary to the previous findings of the above authors. However this relation between confidence and change agrees with others in social psychology e.g. that of Deutsch & Gerard (1955) who found that the more uncertain an individual was that his perceptual judgement was correct, the more his

judgement could be influenced. This finding in this experiment is supported by the correlation between influence and confidence. If high confidence individuals are the ones who exercise influence and low confidence individuals do not, it would be expected that the latter would change their decisions while the former would not.

A significant increase in confidence for final decisions, since this occurred for all conditions, is of little theoretical interest. Also, in the absence of a control group it is not known whether this is due to the manipulations intervening between initial and final decisions or whether it would occur simply as a result of the making of second decisions.

F. Influence

The lack of a significant correlation between initial risk taking and rankings of perceived influence by the public discussion condition is an unexpected finding. Only in the studies by Kogan & Wallach (1967) and Wallach, Kogan & Burt (1967) has this relationship not been found when influence has been investigated. However, the subject groups in the former study were composed of particular personality types (high or low defensiveness coupled with high or low anxiety) while in the latter study this relationship was found for field independents but not for

field dependents. In other studies in which subjects have been randomly allocated to groups, as they were in this study, and in which measures of influence or forcefulness have been obtained e.g. Wallach, Kogan & Bem (1962), those who were initially more risky were perceived to be more influential.

The reason for the absence of this relationship in this study is far from clear since the same method for obtaining rankings of influence was employed in this experiment as has been used by many others (Wallach, Kogan & Bem, 1962). One possible reason is that other experiments have either involved discussion to consensus or, in those cases where discussion to consensus has not been used, final decisions have been made after the discussion of each problem. Both of these procedures may have drawn greater attention to the degree of influence exercised by each group member than was done by the procedure used in this study where final decisions were not made until discussion of all problems was completed.

Whatever the reason, the result found in this experiment casts some doubt on the strength of the relationship between risk taking and perceived influence and hence on the possibility that leadership favouring risk contributes to the risky-shift. It appears that in some situations,

high risk takers are not ranked as more influential than low risk takers even although a risky-shift does occur.

G. Summary

The discussion of results suggested that tentative support could be given to the proposal that publicity of initial decisions reduces the magnitude of the risky-shift in comparison with that which occurs when initial decisions are private. The evidence relevant to this conclusion was that significantly fewer decisions were changed in public than in private conditions and, in addition, risky-shifts were smaller, although not significantly so, in familiarisation, information and listening conditions when initial decisions were public than when they were private. The possible importance of the control of this publicity variable was demonstrated by considering how erroneous conclusions may be made regarding the contribution of familiarisation and restricted information to the risky-shift occurring in discussion groups when conditions in which initial decisions are private rather than public are compared with the public discussion condition.

This study's lack of support for a familiarisation and also for a value interpretation (as tested by a restricted information condition) was discussed, as was the support for value and information as a partial explanation. It was suggested that the difference in the

risky-shifts of the listening conditions (and particularly listening public) to that of the discussion condition, indicated the importance of group interaction per se to the risky-shift. The possibility that this supported a responsibility diffusion explanation was considered and it was suggested that an examination of the nature of the group interaction may assist in the search for the explanation of the risky-shift.

The discussion concluded with a consideration of two findings contrary to previous results. First, high confidence individuals shifted less to risk than those with less confidence in their initial decisions; second, high risk takers were not ranked as more influential in discussion than low risk takers. It was suggested that this latter result decreased the likelihood that a leadership explanation was tenable.

CHAPTER SIX

Conclusions and Implications

A. The Public/Private Variable

The major aim of this study was to determine whether the public/private variable was of importance for the magnitude of the risky-shift. The evidence presented in this study does suggest that this variable should be controlled in those studies which compare the risky-shifts of non-interacting and discussion groups. Although the risky-shifts of public and private conditions have not been shown to be significantly different (except for discussion public and private), fewer decisions were changed in public than in private conditions, thus demonstrating that publicity of initial decisions does influence the change in decisions which is induced by the experimental manipulations.

This study may be criticised for the nature of the publicity manipulation used. It has already been pointed out that the method used was governed largely by the familiarisation condition. Had a stronger manipulation been used, differences observed in this experiment may well have reached statistical significance. While decisions in the discussion public condition are made public in a

face-to-face situation and also are often defended, the publicity manipulation in other conditions lacks both the face-to-face component and also the defense of decisions. If subjects in a public listening condition were asked to write notes explaining to other subjects the reason for a particular decision as well as having their decisions made public, this publicity would then more closely approximate that which occurs in the discussion condition and differences between public and private listening conditions may well be more pronounced. Possibly a superior experimental strategy may have been to investigate the publicity variable for a listening condition only. A publicity manipulation similar to that suggested above could then have been used. However, it was felt that if publicity of initial decisions was a variable of some importance for the magnitude of the risky-shift, the manipulation used should have been sufficient to demonstrate this importance. The results do give some support to the possibility that this variable is one which should be controlled so that a further study could now well concern itself with reproducing as closely as possible in a listening condition, the publicity which occurs in the discussion condition. It would be expected that the somewhat tentative results in this experiment concerning the

importance of the publicity variable, would then be more firmly supported.

B. The Explanation of the Risky-Shift

Considerable evidence was presented in the literature review which suggested that the value and information interpretation constituted a partial explanation of the risky-shift. Not only has listening to a discussion of the choice dilemmas been shown to result in a risky-shift of a magnitude which approached that of the discussion-induced shift, but the interpretation has the added utility of being able to explain the shift to caution.

In this study, listening does result in a risky-shift, although the difference between the risky-shifts of the listening public and discussion public conditions clearly indicates that the value and information interpretation is at best, only a partial explanation.

Nevertheless, there are reasons to question this conclusion. Possibly the major criticism of the study is the assumption that publicity of initial decisions in the discussion groups has the effect of stabilising the decisions in this condition. While there are reasons to assume that this may well be the case, no evidence can be presented to confirm this assumption, and indeed, it

would appear to be extremely difficult to test. However, this conclusion is not solely dependent on the risky-shift of the listening public condition. While the listening private condition does shift further to risk than listening public, the risky-shift of listening private is still less than that of discussion public, thus supporting the conclusion drawn from a comparison of listening public and discussion public conditions that the value and information interpretation appears to be insufficient to explain the risky-shift.

One must also question however the validity of the listening condition as a test of the value and information interpretation. While both value and information may be operating in this condition to induce a risky-shift, the value of risk (or caution) may not be as salient in such a condition as it is in a discussion condition. Possibly value and information operate at greater strength in the discussion groups than in the listening groups. Thus the difference between the two conditions may be due to this factor. While this would suggest that the group interaction is of some importance, it would also suggest that a mechanism such as responsibility diffusion is not necessarily required.

Another factor may also be acting to reduce the shift

apparently caused by value and information. During this study, E noticed that subjects in the listening conditions appeared to become somewhat bored as the experiment proceeded. This did not appear to occur in any other conditions as subjects were busy writing or discussing whereas in the listening conditions, subjects simply sat and listened. Possibly this could be corrected by asking subjects to take notes on points they considered to be important arising from the discussion. This may eliminate the boredom which appears to occur and would also help to ensure that the discussion received careful attention. One can only speculate on the effect this may have on the risky-shift, but possibly shifts would be larger under these conditions.

Thus apart from considerations of the publicity of initial decisions, there are two difficulties associated with listening as a test of the value and information mechanism. The decrease in information transmission which may be occurring as a result of inattention would appear to be readily subject to correction. However, the possibility that the value of risk may become more salient as a result of participation in a discussion than is the case for listening subjects would appear to be extremely difficult to test.

Responsibility diffusion has not been directly tested in this experiment and so this interpretation cannot be accepted or rejected. Some evidence - that from the discussion private condition - did not favour it, but the difference in the risky-shifts of listening and discussion conditions does suggest that it may be a possible explanation in that group interaction does appear to be of importance. However, unless the supporters of this interpretation can provide evidence which clearly favours such an interpretation, this writer at least, will remain unimpressed with its ability to explain the risky-shift. In addition, one must remember its apparent inability to explain the shift to caution.

Two other possible explanations of the risky-shift, familiarisation and the original value interpretation received no support. Some reasons for the Teger & Pruitt (1967) finding of a risky-shift for a restricted information condition were suggested, but the positive results for familiarisation would appear to defy explanation.

Thus this study has not resolved the problem of explaining the risky-shift although it is becoming increasingly clear that the more parsimonious explanations - familiarisation and restricted information - are insufficient. Group interaction per se does appear to be of importance but

whether this is because it mediates a mechanism other than value and information e.g. responsibility diffusion, is still subject to question.

C. The Risky-Shift: Its Applied Significance

While there is considerable doubt as to the mechanism which causes the risky-shift, there is no doubt that discussion of the choice dilemmas results in a risky-shift for the large majority of these problems. This raises the question of the extent to which this finding can be generalised to other decisions concerning risk. Evidence was presented in the literature review which suggested that considerable generality could be ascribed to the risky-shift in that it was not limited to the hypothetical dilemmas but generalised to situations which involved both positive and negative consequences. However, these situations are still somewhat less than real in that they are either laboratory experiments (Wallach, Kogan & Bem 1964, intellectual problem solving; Bem, Wallach & Kogan 1965, risk of aversive consequences, Pruitt & Teger 1967, gambling problems) or are hypothetical situations, albeit made in extra-laboratory situations (Siegel & Zajonc 1967, clinical and choice dilemmas in a clinical setting). Possibly what the field requires is less attention, temporarily at least, to the reasons for the risky-shift, and

more attention to its study in real-life situations. Gambling situations at a race track would be one possibility as would the study of decision making by businessmen as group decision making or individual decision making following group discussion would appear to be a regular procedure and one which would seem to incorporate the group discussion desired in such studies. Whether a shift to increased risk taking would be manifested in these situations is a matter for speculation. Wallach, Kogan & Bem (1964) for example, have speculated on the implications of the risky-shift for military policy and strategy, suggesting that rather than the expected check-and-balance type of influence among staff that might be expected, the more risky strategy may prevail. However, they say, "We do not wish to push these analogies too far." This is certainly an important qualification. While the risky-shift does have considerable generality, there is little basis on which to generalise beyond the situations and stimuli studied to date. Indeed, it must be remembered that not all of these dilemmas shift to risk. Possibly the study of such real-life situations would lead to the conclusion drawn by Brown (1965), when it became clear that all the dilemmas do not shift to risk, that is, a risky, a cautious or no shift may be the result of

discussion of situations involving risk.

Thus while the finding for a number of sets of stimulus material of a risky-shift both for group and individual decisions as a result of group discussion is of considerable interest in view of the previous lack of research in this area, and while this finding has generated a considerable amount of research, its significance for real-life situations remains to be determined.

CHAPTER SEVEN

Summary

A study was undertaken to investigate the effect of publicity of initial decisions for the Wallach & Kogan choice dilemmas on the risky-shift induced by familiarisation, information, listening and discussion. These four conditions were investigated under public and private conditions using a 4 x 2 design. The use of these conditions also made it possible to investigate the extent to which the familiarisation, value, and value and information mechanisms could explain the risky-shift, and whether control of the publicity variable would effect these conclusions. Comparison of the risky-shifts of these conditions with that of the discussion condition also enabled conclusions to be drawn concerning the importance of group interaction for the risky-shift.

One hundred and ninety two University of Canterbury Students served as subjects, with twelve male and twelve female students being used in each of the eight conditions.

The results suggested that tentative support could be given to the possibility that publicity of initial decisions did reduce the magnitude of the risky-shift and results from the comparison of the risky-shifts of familiarisation and information conditions with that of

the discussion public condition were used to demonstrate the possibility of drawing incorrect conclusions without control of this variable.

The familiarisation and value interpretations of the risky-shift (the latter being tested by the information condition) were given no support and neither could a leadership interpretation be supported. However, the evidence did favour the value and information interpretation as a partial explanation. The responsibility diffusion explanation was not supported by data from the discussion private condition but evidence indicating the importance of the group interaction suggested that this interpretation could not be disregarded. It was suggested that a study of the group interaction, since it appeared to be of importance, may be a useful way to proceed if the risky-shift is to be completely explained.

Conclusions and implications for future research and a consideration of the applied significance of the risky-shift concluded the research report.

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APPENDIX 1

The Wallach & Kogan Choice Dilemma Problems

1.

Mr. A. an electrical engineer, who is married and has one child, has been working for a large electronics company since graduating from university 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 tick the lowest probability that you would consider acceptable to make it worthwhile for Mr. A. to take the new job.

_____ The chance 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.

_____ Please place a tick 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 doctor 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 favourite leisure-time pursuits. The doctor 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.

3.

Mr. C, a married man with two children, has a steady job that pays him about \$3,000 per year. He can easily afford the necessities of life, but few of the luxuries. Mr. C.'s father, who died recently, carried a \$2,000 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 might double their present value if a new product currently in production is favourably received by the buying public. However, if the product is unfavourably received, the stocks would decline in value.

4.

Mr. D, is the captain of a university rugby team. The team is playing its closest rival in a competition in the final game of the season. The game is in its final seconds and the university team is just behind on points. A penalty has just been awarded to the university team. Mr. D. must decide whether to kick a very easy goal and tie the scores or try a risky move which could bring victory if it succeeded, but defeat if it did not.

5.

Mr. E, is president of a light metals company. The company 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 N.Z. where there would be a moderate return on the initial investment, or building a plant in a foreign country. Lower labour 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.

6.

Mr. F, is a recent university graduate who is very eager to pursue post 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.

7.

Mr. G, a competent chess player, is participating in a national chess tournament. In an early match he draws the top-favoured 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-favoured man, Mr. G. notes the possibility of a deceptive though risky manouvre which might bring him a quick victory. At the same time, if the attempted manouvre should fail, Mr. G. would be left in an exposed position and defeat would almost certainly follow.

8.

Mr. H, a third year university student, 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 doctor, 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. realises 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.

9.

Mr. J, is a New Zealander captured by the enemy in World War 11 and placed in a prisoner-of-war camp. Conditions in the camp are quite bad, with long hours of hard physical labour 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.

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 parliamentary 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.

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 realises that he might work on a difficult, long-term problem which, if a solution would be found, would resolve basic scientific issues in the field and bring high scientific honours. 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.

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 counsellor as to whether it would be wise for them to marry. On the basis of those meetings with a marriage counsellor, they realise that a happy marriage, while possible, would not be assured.

APPENDIX 2

A. The Confidence Scale

By placing a tick on the scale below, indicate approximately how sure you are that your decision is the recommendation that should be given to the central figure.

Not sure at all											Extremely sure
0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	

B. The Influence Measure

Rank each individual in the group in terms of how influential they were in the discussion.

Include yourself.

Most influential	1)	_____
	2)	_____
	3)	_____
Least influential	4)	_____

APPENDIX 3

The Standardised Instructions

A. Initial Decisions

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.

Consider this situation. Mr. P, a 28 year-old management trainee who is married and has two children, has decided to move from his present home. He is trying to decide whether to build an expensive new home at a cost much greater than he can now afford, but which would be within his means if he gained a possible, but not certain promotion in his company, or to buy an older house which he could afford on his present salary. Thus Mr. P. can choose the more attractive alternative - i.e. build the new house, but he runs the risk that his promotion may not eventuate, forcing him to give up the new house. On the other hand, he can choose the less desirable alternative and buy the older house which he can now afford.

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 alternative, X, be chosen. In the situation above, e.g., what are the minimum odds of Mr. P's receiving the promotion which you would demand before recommending that he build the expensive home.

- ☐ The chances are 1 in 10 that he will be promoted.
- ☐ The chances are 3 in 10 that he will be promoted.
- ☐ The chances are 5 in 10 that he will be promoted.
- ☐ The chances are 7 in 10 that he will be promoted.
- ☐ The chances are 9 in 10 that he will be promoted.
- ☐ Please place a tick here if you think Mr. P. should not build the new house no matter what the probabilities.

So your task is to make a decision and place a tick in the appropriate space.

Read each situation carefully before giving your judgement. 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.

Now after each decision you will be required to indicate approximately how sure you are that your decision is the recommendation that should be given to the central figure. This will be done in the following way. After each problem there will be a scale identical to the one below. On the scale, place a tick to indicate that you are approximately _____% sure that your decision is the recommendation that should be given to the central figure.

Not sure
at all

Extremely
sure

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Thus as soon as you have made a decision for a problem, indicate approximately how sure of this decision you are.

The following additional instructions were then read to the subjects.

There are two further points that I should like to bring to your attention which may seem clear enough now, 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. Thus providing Mr. P receives the promotion it is more desirable for him to build the new house than to buy the older one. The second point concerns the meaning of the odds you are being asked to mark. It is not your task to decide what the odds might actually be in a life situation. 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. Pass in your booklets as soon as you have finished the twelve problems.

B. Instructions for Experimental Manipulations

1. Familiarisation Private

We now want you to put yourself in the position of a person attempting to make explicit to the central figure, the advantages and disadvantages of the two alternatives in each problem in an effort to help him make a decision. Let me explain the purpose of this. In a counselling situation, psychologists often wish to make clear to a client the advantages and disadvantages in a situation, in an effort to assist the client make his own decision. We are interested to see how well you people are able to make clear the advantages and disadvantages of the two alternatives in each problem. So your task is to try to clarify the nature of each alternative open to the central person. As you may need this information later, note on the copy of the problem what you consider to be the important issues. Use whatever method you use everyday, such as underlining, starring, jotting in the margin, or making lists of pros and cons. Feel free to read between the lines. You will have about five minutes for each problem.

2. Familiarisation Public

We now want you to put yourself in the position of a person attempting to make explicit to the central figure, the advantages and disadvantages of the two alternatives in each problem in an effort to help him make a decision. Let me explain the purpose of this. In a counselling situation, psychologists often wish to make clear to a client the advantages and disadvantages in a situation, in an effort to assist the client make his own decision. We are interested to see how well you people are able to make clear the advantages and disadvantages of the two alternatives in each problem. So your task is to try to clarify the nature of each alternative open to the central person. As you may need this information later, note on the copy of the problem what you consider to be the important issues. Use whatever method you use everyday, such as underlining, starring, jotting in the margin, or making lists of pros and cons. Feel free to read between the lines. You will have about five minutes for each problem.

In addition to this, three of you are going to be given the twelve decisions made by the fourth member of the

group. Later we will be interested to know, in those cases where the decisions were different to yours, if this aided you in reviewing the problems - e.g. by causing you to look for the reasons leading to that decision.

At the moment only one person's decisions will be made public as it would take too much time to go through the four booklets and make copies of everyone's decisions for all four of you. But now, by a chance procedure, the twelve decisions made by one of you will be selected and those will be distributed to the rest of the group. You will know whose decisions they are as that person's name will be written beside the decision.

Here then, is the procedure for this part of the experiment. You will all be handed a copy of the first problem and three of you will also receive a named copy of the fourth member's decision for that problem. Notice who made the decision and compare it with your own. With that decision in mind, review the problem. The person whose decisions are being made public will not receive information about the others' decisions during this part of the experiment but will just review the problem. This procedure will be followed for all twelve problems so that at the end of this stage of the experiment you will all have reviewed each problem and three of you will know what decisions the fourth member has made for all twelve problems.

3. Information Private

You are now going to be given, one problem at a time, the decisions made by the other members of the group. These decisions will not be named however, so that your decisions will be completely private. You will receive the decisions the three others have made for the first problem for example, but you will not be able to tell which person has made any particular decision and similarly the rest of the group will not know what decisions you made.

As well as this, you are going to be given new copies of each problem. Thus you will receive the decisions for problem one, and a copy of that problem. Examine the decisions the others have made and compare them with your own. Then, examine the problem again. Put yourself in the position of a person attempting to make explicit to the central figure, the advantages and disadvantages of the two alternatives in each problem in an effort to help him make a decision. Let me explain the purpose of this.

In a counselling situation, psychologists often wish to make clear to a client the advantages and disadvantages in a situation, in an effort to assist the client make his own decision. We are interested to see how well you people are able to make clear the advantages and disadvantages of the two alternatives in each problem. The information you receive on the decisions made by the others in the group may assist you - e.g. by causing you to look for the reasons leading to those decisions. So your task is to try to clarify the nature of each alternative open to the central person. As you may need this information later, note on the copy of the problem what you consider to be the important issues. Use whatever method you use everyday, such as underlining, starring, jotting in the margin, or making lists of pros and cons. Feel free to read between the lines. You will have about five minutes for each problem.

Thus you will be given the decisions of the rest of the group for the first problem and a copy of the first problem which you will review. After about five minutes you will be asked to hand in the copy of the problem and the other members' decisions and you will receive the decisions for the second problem and a copy of that problem. This procedure will be followed for all twelve problems so at the end of this stage of the experiment you will have reviewed each problem and you will have seen all the decisions made by others in the group.

4. Information Public

You are now going to be given, one problem at a time, the decisions made by the other members of the group. These decisions will be named so that you will know the decisions each members of the group has made for each problem. Also, of course, the decisions you made will be known by the group.

As well as this, you are going to be given new copies of each problem. Thus you will receive the named decisions for problem one, and a copy of that problem. Examine the decisions the others have made, notice who made them, and compare them with your own. Then examine the problem again. Put yourself in the position of a person attempting to make explicit to the central figure the advantages and disadvantages of the two alternatives in each problem in an effort to help him make a decision. Let me explain the

purpose of this. In a counselling situation, psychologists often wish to make clear to a client the advantages and disadvantages in a situation, in an effort to assist the client make his own decision. We are interested to see how well you people are able to make clear the advantages and disadvantages of the two alternatives in each problem. The information you receive on the decisions made by the others in the group may assist you - e.g. by causing you to look for the reasons leading to those decisions. So your task is to try to clarify the nature of each alternative open to the central person. As you may need this information later, note on the copy of the problem what you consider to be the important issues. Use whatever method you use everyday, such as underlining, starring, jotting in the margin, or making lists of pros and cons. Feel free to read between the lines. You will have about five minutes for each problem.

Thus you will be given the named decisions of the rest of the group for the first problem and a copy of the first problem which you will review. After about five minutes you will be asked to hand in the copy of the problem and the other members' decisions and you will receive the decisions for the second problem and a copy of that problem. This procedure will be followed for all twelve problems so that at the end of this stage of the experiment you will have reviewed each problem and you will know what decisions every other member of the group has made.

5. Listening Private

You are now going to hear a tape recording of a discussion of the twelve problems you have just considered. Let me explain the purpose of this. In a counselling situation, psychologists often wish to make clear to a client the advantages and disadvantages in a situation, in an effort to assist the client make his own decision. Now one way in which this clarification could be achieved, is to have people discuss in a group the decision they would recommend to the central figure. In such a situation the advantages and disadvantages of a number of recommendations may become clear. Now we have already had a group of Canterbury students discuss these situations together and they have made points for and against a number of different recommendations. Later we will be interested in your opinion of their discussion as a means of bringing out the advantages and disadvantages of a number of decisions. You will be given a copy of the problem to read over before hearing the discussion of that problem.

6. Listening Public

You are now going to hear a tape recording of a discussion of the twelve problems you have just considered. Let me explain the purpose of this. In a counselling situation, psychologists often wish to make clear to a client the advantages and disadvantages in a situation, in an effort to assist the client make his own decision. Now one way in which this clarification could be achieved, is to have people discuss in a group the decision they would recommend to the central figure. In such a situation the advantages and disadvantages of a number of recommendations may become clear. Now we have already had a group of Canterbury students discuss these situations together and they have made points for and against a number of different recommendations. Later we will be interested in your opinion of their discussion as a means of bringing out the advantages and disadvantages of a number of decisions. You will be given a copy of the problem to read over before hearing the discussion of that problem. In addition to this, three of you are going to be given the twelve decisions made by the fourth member of the group. Along with the discussion you will hear, this will give you some idea of the diversity of decisions made for each problem.

At the moment only one person's decision will be made public as it would take too much time to go through the four booklets and make copies of everyone's decisions for all four of you. But now, by a chance procedure, the twelve decisions made by one of you will be selected and these will be distributed to the rest of the group. You will know whose decisions they are as the person's name will be written beside the decision.

Here then, is the procedure for this part of the experiment. You will all be handed a copy of the first problem and three of you will also receive a named copy of the fourth members decision for that problem. Notice who made the decision and compare it with your own. With that decision in mind, listen to the discussion of the problem. The person whose decisions are being made public will not receive information about the others decision but will just listen to the discussion. This procedure will be followed for all twelve problems so that at the end of this stage of the experiment you will all have heard discussions of the problems and three of you will know what decisions the fourth member has made for all twelve problems.

7. Discussion Private

The questionnaire you now have in front of you is the same one you just completed. We have had each of you do this so that you would become familiar with all of the situations it contains. What we are really interested in is whether you can discuss each situation without being influenced by the decisions you have made.

Let me explain the purpose of this. In a counselling situation psychologists often wish to make clear to a client the advantages and disadvantages in a situation in an effort to assist the client make his own decision. In doing this, he must not be influenced by the recommendation he would make himself. We are interested to see how well a group is able to do this. Put yourselves in the position of a group attempting to make explicit to the central figure the advantages and disadvantages of the two alternatives in each problem in an effort to help him make a decision.

Thus your job is to raise points for and against each alternative without being influenced by the decision you have made. So even if you agree with a remark made by another member of the group, your job is to point out the faults and difficulties in that argument.

A tape recording of this discussion is being taken so that later we can listen to it and see if we can decide what decisions each of you made from the things you said in the discussion.

So there are two things you must do. First, raise as many arguments for and against each alternative as possible in an attempt to make clear the advantages and disadvantages in each situation for the central person. Second, ensure that your decisions are as private at the end of the discussion as they are now.

8. Discussion Public

The questionnaire you now have in front of you is the same one you just completed. We have had each of you do this so that you would become familiar with all of the situations it contains. We are really interested in having you discuss each of these situations as a group. Let me explain the purpose of these discussions. In a counselling

situation, psychologists often wish to make clear to a client the advantages and disadvantages in a situation in an effort to assist the client make his own decision. Now one way in which this clarification could be achieved is to have people discuss in a group the decisions they would recommend to the central figure. In such a situation the advantages and disadvantages of a number of recommendations may become clear. We are interested to see if this is the case. A tape recording of this discussion is being taken so that later we can see if a number of different points of view are made clear. You will have about five minutes to discuss each situation.

9. The Publicity forms

a) The form on which initial decisions were supposedly made public for public familiarisation and public listening conditions.

Decision made for this problem. _____

Name. _____

b) The form on which initial decisions were made public for the information public condition.

Decisions made by the other
members of the group for this
problem.

Name:

C. Final Decisions

We now want you to go back over each of these situations and indicate your present decision. It is quite natural that some further thoughts may have occurred to you since you indicated your reactions to the situations the first time. You need not consider yourself bound by any of the past decisions as we're not interested in your prior opinion but rather in just how you feel about the situation now. If you still feel the same way that's quite all right, but we should like you to reconsider each situation and indicate the recommendation you would give to the central figure at the present time.

As before, we would also like you to indicate approximately how sure you are that your decision is the recommendation that should be given to the central figure.

APPENDIX 4

Norms for Initial Decisions and Risky-Shifts

Mean initial decisions and discussion-induced risky-shifts per choice dilemma problem as presented by Pruitt & Teger (1967) and as obtained in this study.*

<u>Problem</u>	<u>Pruitt & Teger norms</u>		<u>Data for this study</u>	
	<u>Initial</u> <u>Decisions</u> ⁺	<u>Risky-</u> <u>Shifts</u> ⁺⁺	<u>Initial</u> <u>Decisions</u> ⁺	<u>Risky-</u> <u>Shifts</u> ⁺⁺
1	5.14	-0.97	6.14	-0.42
2	6.83	-0.27	6.70	+0.17
3	6.26	-0.63	7.03	-1.13
4	4.86	-1.68	6.01	-0.92
5	7.74	+0.09	7.87	-0.25
6	5.08	-0.97	5.42	-1.17
7	4.59	-1.83	4.44	-0.88
8	6.43	-0.83	6.35	-0.04
9	5.01	-0.77	5.71	-0.25
10	5.85	-0.68	6.25	-0.08
11	4.46	-0.64	5.22	-1.13
12	7.39	+0.75	8.27	+0.04

*The data for this study for initial decisions are based on 192 subjects, while that for the risky-shifts are based on 24 subjects (i.e. those in the discussion public condition.)

⁺Lower numbers imply greater initial risk.

⁺⁺A negative number denotes a risky-shift.

APPENDIX 5

Experimental Setting

A diagram of the experimental setting as looking from above.

== Represents a communication slot.