

INFORMATION TO USERS

This material was produced from a microfilm copy of the original document. While the most advanced technological means to photograph and reproduce this document have been used, the quality is heavily dependent upon the quality of the original submitted.

The following explanation of techniques is provided to help you understand markings or patterns which may appear on this reproduction.

1. The sign or "target" for pages apparently lacking from the document photographed is "Missing Page(s)". If it was possible to obtain the missing page(s) or section, they are spliced into the film along with adjacent pages. This may have necessitated cutting thru an image and duplicating adjacent pages to insure you complete continuity.
2. When an image on the film is obliterated with a large round black mark, it is an indication that the photographer suspected that the copy may have moved during exposure and thus cause a blurred image. You will find a good image of the page in the adjacent frame.
3. When a map, drawing or chart, etc., was part of the material being photographed the photographer followed a definite method in "sectioning" the material. It is customary to begin photoing at the upper left hand corner of a large sheet and to continue photoing from left to right in equal sections with a small overlap. If necessary, sectioning is continued again — beginning below the first row and continuing on until complete.
4. The majority of users indicate that the textual content is of greatest value, however, a somewhat higher quality reproduction could be made from "photographs" if essential to the understanding of the dissertation. Silver prints of "photographs" may be ordered at additional charge by writing the Order Department, giving the catalog number, title, author and specific pages you wish reproduced.
5. PLEASE NOTE: Some pages may have indistinct print. Filmed as received.

Xerox University Microfilms

300 North Zeeb Road
Ann Arbor, Michigan 48106

74-18,700

NADIEN, Margot B., 1930-
EFFECTS OF LOCUS OF CONTROL AND SITUATIONAL
DIFFERENCES ON RISKY DECISION MAKING.

The City University of New York, Ph.D., 1974
Psychology, experimental

University Microfilms, A XEROX Company, Ann Arbor, Michigan

© COPYRIGHT BY

MARGOT B. NADIEN

1974

EFFECTS OF LOCUS OF CONTROL AND SITUATIONAL DIFFERENCES
ON RISKY DECISION MAKING

BY

MARGOT NADIEN

A dissertation submitted to the
Graduate Faculty in Psychology
in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy, The City
University of New York

1974

This manuscript has been read and accepted for the Graduate Faculty in Psychology in satisfaction of the dissertation requirement for the degree of Doctor of Philosophy.

3/25/74

date

Florence L. Denmark
Chairman of Examining Committee

3/25/74

date

Florence L. Denmark
Executive Officer

Prof. Florence Denmark

Prof. Louis Gerstman

Prof. Walter Weiss

Supervisory Committee

The City University of New York

ACKNOWLEDGEMENTS

There are several persons to whom I am indebted for their aid in making this study possible.

Firstly, I wish to express my grateful thanks to Dr. Florence Denmark, my dissertation chairman. Her helpful suggestions, her guidance, and her consistent warm support were greatly appreciated.

I owe a special debt of gratitude to Dr. Louis Gerstman for the invaluable aid, guidance and critical evaluations offered throughout my dissertation work. His kindness and efforts on my behalf were of incalculable aid and made the completion of my dissertation infinitely easier than would otherwise have been the case. It was an enriching experience, both personally and professionally, to have worked with Dr. Gerstman.

I am also deeply appreciative of the wise and constructive suggestions given by Dr. Walter Weiss at each stage of my dissertation work and for the consistent help and guidance offered to me throughout my years as a graduate student.

To Dr. Florence Schmeidler and Dr. Ross Harrison I am also much indebted for their constructive advice and comments.

I owe special thanks to Dr. Geraldine Fennell for the sympathetic interest, critical comments and counsel given during the entire period of my dissertation work.

I would also like to express my appreciation to Dr. Ruth Skydell and to Miss Erica Fischer for their aid in finding subjects and in running the experiment.

Lastly, and certainly not least, I wish to express my deep

gratitude to my husband, without whose warm encouragement and moral support I could never have undertaken graduate work nor completed my dissertation.

TABLE OF CONTENTS

ACKNOWLEDGEMENTS	i
LIST OF TABLES.	vi

<u>Chapter</u>	<u>Page</u>
I Introduction	1
II Background	9
The Burnstein-Vinokur Model of Decision Making Under Uncertainty.	9
A. Edwards' Subjective Expected (SEU) Model.	10
B. Kogan-Wallach Dilemmas.	12
C. The Utilities' Ratio Model of Burnstein and Vinokur	14
D. Limitations of the Burnstein-Vinokur Model.	15
Locus of Control and Its Relationship to Variables that Might Influence Risk-Taking Levels and Processes	18
A. Locus of Control and a Success or Failure Orientation	18
B. Locus of Control and Levels of Self-Confidence.	21
C. Locus of Control and the Acquisition and Utili- zation of Information in Decision Making.	22
D. Locus of Control and Differential Responses to Skill and Chance Tasks.	24
E. Locus of Control and Rationality.	29
Methodological Issues Relating to the Burnstein- Vinokur Model	31
Locus of Control and the Differential Applicability of the Burnstein-Vinokur Model	35
A. Locus of Control and Differential Expectancies of Success in Skill-Perceived and Chance- Perceived Situations.	35

B. Locus of Control and Differences in Risk-Taking Processes in Skill-Perceived and Chance Perceived Situations	.36
C. Locus of Control and Differential Relationships Between Subjective Expectancy of Success and the Utilities	.37
Hypotheses	.39
III Method.	.41
Exploratory Study	.41
Revision of Kogan-Wallach Dilemmas.	.42
Pilot Study	.46
Subjects	.46
Materials.	.46
Results and Discussion	.47
Main Experiment	.51
Subjects	.51
Materials.	.55
1. Demographic Questionnaire	.55
2. Measurement of Locus of Control	.56
3. Measurement of Risk-Taking Preference	.56
4. Measurement of Utilities.	.57
5. Measurement of Subjective Expectancy of Success	.58
Procedure.	.58
IV Results	.61
Levels of Various Response Measures as a Function of Locus of Control and Situational Differences	.62
Dissimilarities in Decision-Making Processes in Skill and Chance Situations as a Function of Locus of Control and of Situational Differences	.66

Relationships of Subjective Expectancy of Success (p_s) with Risk-Taking Preferences (p_m), the Utilities' Ratio ($\hat{p}$), and Separate Utilities (U_s , U_c , U_f)	.69
Contrasts between Subgroups and the Total Sample on Risk-Taking Processes.	.70
V Discussion	.73
The Differential Applicability of the Burnstein-Vinokur Model.	.73
Risky Decisions as a Joint Function of Personality and Situational Factors	.75
An Alternative Decision-Making Model.	.76
The Burnstein-Vinokur Model: A Measure of Rational or Nonrational Risk-Taking?	.77
ICs' Risk Taking in Skill-Determined Situations	.79
The Role of Subjective Expectancy of Success.	.81
Implications and Suggestions.	.82
VI Abstract	.86
APPENDICES	
Appendix A. Exploratory Study Findings	.89
Appendix B. Kogan-Wallach Dilemmas.	.90
Appendix C. Kogan-Wallach-Nadlen Situations.	.93
Appendix D. Pilot Study Materials and Tables	.99
Appendix E. Main Study: Rotter Score Tables and Test Instruments.	120
Appendix F. Debriefing Statement	138
Appendix G. Multivariate Analyses on Skill and Chance Situations	142
Appendix H. Multivariate Analyses on Combined Skill and Combined Chance Situations	148
BIBLIOGRAPHY	151

AUTOBIOGRAPHICAL STATEMENT	155
--------------------------------------	-----

LIST OF TABLES

Table

1. Risk Taking and Related Dependent Measures for Skill- and Chance-Determined Situations for Three Subgroups and the Total Sample.	.64
2. Correlations with Risk-Taking (p_m) of Five Dependent Variables in Skill-Determined and Chance-Determined Situations for Three Subgroups and the Total Sample . .	.67
3. Correlations with Subjective Expectancy of Success (p_s) of Four Dependent Variables in Skill- and Chance-Determined Situations for Three Subgroups and the Total Sample.	.71

Tables in Appendices

Appendix A

Mean Scores of Ten Male Judges Indicating the Amount of Perceived Personal Ability to Control Outcomes in the Original Kogan-Wallach Situations.	.89
--	-----

Appendix D

1. Means, Standard Deviations and Range of Responses for 29 <u>Ss</u> (10 ICs, 10 ECs and 9 Ambis) on Three Skill- and Three Chance-Determined Situations.	114
2. Medians and Deviations Therefrom, Reflecting the Amount of Perceived Personal Control Over Outcomes Among ICs, ECs and Ambis in Three Types of Situations.	115-117
3. Frequency Distribution of Medians Across all <u>Ss</u>	118
4. Means, Standard Deviations and Raw Median Scores for 29 <u>Ss</u> (10 ICs, 10 ECs and 9 Ambis) on Three Skill and Three Chance-Determined Situations.	119

Appendix E

1. Rotter Scores for Three Subgroups of <u>Ss</u> and for the Total Sample.	120
2. Mean Ages for the Three Subgroups of <u>Ss</u> and for the Total Sample.	121

Appendix G

- 1 through 6. Multivariate Analyses of Variance for Each of the Six Variables (p_m , p_s , U_s , U_c , U_f , and $\hat{p}$) in Skill Situations 142-144
- 7 through 12. Multivariate Analyses of Variance for each of the Six Variables (p_m , p_s , U_s , U_f , U_c and $\hat{p}$) in Chance Situations. 145-147

Appendix H

- 1 through 6. Multivariate Analyses for each of the Six Variables (p_m , p_s , U_s , U_f , U_c and $\hat{p}$) in Combined Skill and Chance Situations. . 148-150

Chapter I

INTRODUCTION

Burnstein et al. (1971) and Vinokur (1971) have offered a model for accounting for a person's choice behavior under uncertainty -- specifically, a model that has been applied to Kogan-Wallach situations (1964) involving a choice between two alternatives: a conservative, nonrisky alternative, whose choice yields an almost guaranteed outcome of modest rewards but limited opportunities; and a risky alternative, whose choice will lead to one of two possible outcomes, a success or a failure. If successful, the risky alternative affords a more desirable outcome than the one assured by selection of the conservative alternative; but if unsuccessful, the risky alternative culminates in a less desirable outcome than the one assured by selection of the conservative alternative.

The Burnstein-Vinokur model asserts that a person's risk-taking level can be predicted solely from his ratio of utilities. The person's risk-taking level in the Kogan-Wallach situations is operationally defined as "the minimum odds that an individual requires in order to be willing to select the risky alternative rather than the conservative one;" and an individual's utilities' ratio refers to a relationship between three utilities (three subjective values): (1) the positive utility associated with a

successful outcome in the risky alternative; (2) the negative utility associated with an unsuccessful outcome in the risky alternative; and (3) the utility associated with the minimally rewarding outcome in the conservative alternative. In sum, the Burnstein-Vinokur model holds that the amount of risk that a person is willing to take is strictly determined by his values.

Studies utilizing the Burnstein-Vinokur model indicate that the model is not universally valid in that it has proven to be less applicable to some individuals than to others. This author therefore suggests that a particular variable relating to individual differences, namely locus of control, may explain why the Burnstein-Vinokur model is a less good predictor of the risk-taking of some individuals than it is of others.

Locus of control is a personality construct that refers to a person's generalized expectancy that he can or cannot control situational outcomes (and reinforcements) by virtue of the exercise of his own personal ability and effort. Internally controlled persons (ICs) have a generalized expectancy of success with respect to controlling outcomes and reinforcements through personal ability and effort, whereas externally controlled persons (ECs) have a generalized expectancy of failure to control outcomes and reinforcements through personal ability or effort (Rotter, 1966).

Empirical findings suggest that the Burnstein-Vinokur model's limited applicability may stem from the fact that both levels of risk-taking and determinants of risk-taking might differ depending upon the person's subjective expectancy that the choice of the

risky alternative will lead to a successful or to an unsuccessful outcome. The research literature also suggests that the person's subjective expectancy of success or failure in ability to control outcomes in particular types of situations may, in turn, be influenced by the joint or interactive influences of the individual's generalized expectancy of success (or of failure) and of his perception of the objective characteristics of the situation -- i.e., of his perception as to whether or not a situation provides objective possibilities for controlling the outcome through the exercise of personal ability and effort.

Let us consider, for a moment, a situational factor in terms of a particular element that might distinguish one risky situation from another. This element consists in the clarity with which objective possibilities for personal control inhere in situations. Some situations provide clear-cut indications that a person's skill will influence the outcome to some degree; other situations provide clear-cut evidence that only external factors or chance will determine the outcome; and still other situations are ambiguous in that there is no clear indication as to whether skill or chance represent the dominant factor that will determine the outcome. Situations, then, may be skill-determined, chance-determined, or ambiguous in terms of their objective characteristics.

A factor that complicates the issue of a situation's objective elements (of skill, chance, or ambiguity) is the individual's perception of those objective elements. Are skill-determined situations always perceived by all individuals as offering the opportunity for the

control over outcomes through personal effort and ability? Are chance-determined risky situations invariably recognized as ones in which personal ability and effort will play no part in determining outcomes? And what about ambiguous risky situations -- ones in which the relative roles of skill and chance are unclear? Do individuals differ in their perception of the relative influences that personal skill or that chance factors will exert with respect to the outcome? In other words, perception of control or noncontrol over risky situations may be influenced by individual differences in "perceived control" -- a subjective factor.

Why, one might ask, have I raised such issues as objective characteristics of a task (in terms of ambiguity and nonambiguity) and of subjective characteristics that might influence the perception of a task's objective characteristics? What bearing do such issues have upon risk-taking levels and processes in Kogan-Wallach dilemmas and upon the limited predictive power of the Burnstein-Vinokur model?

The answer stems from this author's deep interest in the processes underlying decision-making. If the Burnstein-Vinokur model had proved to be an adequate predictor of risk-taking for all persons in Kogan-Wallach dilemmas, this author would have turned her attention elsewhere. However, the Burnstein-Vinokur model explains the risk-taking of some persons but not of others. What factor or factors are responsible for the inapplicability of the Burnstein-Vinokur model to some persons and of its applicability to others?

It is this author's contention that the willingness to take

risks, and the factors underlying such willingness to take risks, will be influenced to some degree by a person's perception of "how likely he will be to experience a success if he were to choose the risky alternative" -- i.e., of his generalized expectancy of success.

Now, it became apparent to this author that Burnstein and Vinokur attributed willingness to take risks solely to the subjective value or utility that a person associated with the three possible outcomes in the Kogan-Wallach choice dilemmas. Burnstein and Vinokur never considered the issue of subjective expectancy of success as a possible factor influencing decision-making under uncertainty. As a consequence of disregarding the possible effect of subjective expectancy of success, they also failed to consider whether individual differences in subjective expectancy of success might exist as a function of locus of control and, furthermore, whether such individual differences might be responsible both for (1) differing perceptions of the objective characteristics of the Kogan-Wallach situations and (2) differing perceptions of their own opportunities for controlling situational outcomes regardless of the objective characteristics of the situations.

It also occurred to this author that the Kogan-Wallach dilemmas have never been analyzed in terms of their objective characteristics as skill-determined, chance-determined, or ambiguous situations.

In view of the foregoing, a number of general questions relating to opportunities for personal control must be raised and then explored:

- A. What are the objective characteristics of the Kogan-Wallach dilemmas with respect to the amount of personal control that an individual might have in determining outcomes; specifically, are the Kogan-Wallach dilemmas skill-determined, chance-determined, or ambiguous?
- B. Do the subjective perceptions of the nature of a risky situation like the Kogan-Wallach ones vary as a function of an individual's locus of control -- i.e., of his tendency to perceive that he does or does not possess personal control over outcomes in risky situations?

A consideration of the possible influence of both of these factors -- the objective nature of various types of situations and the subjective perception of various types of situations -- suggests that there are four theoretical possibilities:

- (1) All persons, regardless of locus of control, may perceive the objective probabilities of success or failure in all types of situations in exactly the same way -- they may fail to distinguish between ambiguous, skill-determined and chance-determined situations.
- (2) Persons may differ in their perception of objective probabilities for success only as a function of locus of control -- i.e., only in terms of their subjective expectancy of success.
- (3) All persons, regardless of locus of control, may perceive that the objective probabilities for controlling outcomes will differ in skill-determined situations as opposed to chance-determined or ambiguous ones.

- (4) Persons' perceptions of objective probabilities of success may result from the combined influence of the actual objective probabilities of success inhering in the situations and of their generalized expectancy of personal or nonpersonal control.

The research literature suggests that the first theoretical possibility does not obtain. The other three possibilities have not been investigated in terms of Kogan-Wallach situations. If the second possibility should prove to be the correct one, it would show that the Burnstein-Vinokur model failed to explain the risk-taking of all persons because the effects of individual differences in locus of control had not been taken into account.

If the third possibility should obtain, it would suggest that the Burnstein-Vinokur model failed to explain the risk-taking of all persons because of a failure to account for situational differences.

If the fourth possibility should prove to be the correct one, it would suggest that the Burnstein-Vinokur model failed to take into account both situational and personal factors that bear on an individual's estimate of his probability of success in controlling outcomes.

In sum, then, the purposes of this dissertation are twofold: (1) to account for the limited applicability of the Burnstein-Vinokur model as a predictor of risk-taking by demonstrating that other variables (individual utilities or subjective expectancy of success) may be better predictors of risk-taking for some individuals than is the utilities' ratio, and (2) to show that individual

differences in locus of control (i.e., in perceptions of personal control over outcomes in risky situations) will act separately, or in conjunction with situational factors, to determine a person's risk-taking.

To achieve these ends, the Kogan-Wallach choice of dilemmas will be refined so as to provide two types of clearly definable situations -- skill-determined ones and chance-determined ones -- and persons will be distinguished in terms of individual differences in locus of control.

Chapter II

BACKGROUND

This chapter is designed to provide the necessary background information, theoretical arguments, and empirical findings that together form the basis for the contention that differences both in locus of control and in the type of decision-making situation might necessitate dissimilar models of risk taking.

In order to support this contention, there will be a discussion of two rationality models of risk-taking and of the Kogan-Wallach risk-taking instrument; individual differences in risk-taking and related behaviors as a function of locus of control; methodological issues relating to the Burnstein-Vinokur model; and the possible need for two models of risk-taking -- the Burnstein-Vinokur one and another one -- as a consequence of situational factors and individual differences in locus of control.

I The Burnstein-Vinokur Model of Decision-Making under Uncertainty

An understanding of the Burnstein-Vinokur model is dependent upon an examination both of the Edwards model and of the Kogan-Wallach choice dilemmas; for the Burnstein-Vinokur model was derived from Edwards' Subjective Expected Utility Model and was

applied to the prediction of risk-taking preferences in the Kogan-Wallach situations.

A. Edwards' Subjective Expected Utility (SEU) Model

One of the major contemporary architects of rational decision-making models for situations involving risk or uncertainty is Ward Edwards. After exploring three different models involving differing combinations of objective and subjective values and probabilities, Edwards arrived at the formulation of his subjective expected utility (SEU) model, according to which risk-taking involves a choice between two alternatives, A and B, with each alternative consisting of several potential outcomes that involve combinations of aversive and pleasurable consequences associated with the choice of a particular outcome.

For example, on an afternoon when weather conditions are uncertain, the choice between the alternatives of golfing and sailing would involve different outcomes depending on the state of the weather. If weather outcomes were to involve four possibilities (wind and rain, wind and no rain, no wind and rain, no wind and no rain), then the person would evaluate both the relative aversive or pleasurable consequences for him (the relative value or subjective value or utility) of each of the four possibilities, and then he would give his view of the expected probability (the subjective probability) of the occurrence of each of the four possibilities. With the subjective value (SV) and the subjective probability (SP) estimated in terms of numerical values, the product

of each possibility's SP and SV would then be found, and then the sum of the SP-SV products would constitute the overall expected value of that particular outcome. The overall expected value for outcome A and the overall expected value for outcome B would then be compared, and the particular outcome (A or B) yielding the maximum subjective expected utility (SEU) would then be selected.

In his conceptualization of rational risk-taking, Edwards distinguishes between two types of probability, objective probability and subjective probability, and between two types of values, objective value and subjective value (the latter being customarily referred to as "utilities").

The concept of subjective probability (SP) differs from that of objective probability (OP) in the following way:

OP represents opinions about an event's probability that are based upon the frequency with which an event is known to occur -- a frequency that can be objectively determined (a) according to the laws of probability, and/or (b) on the basis of repeated observations. OP can be ascertained for repeated coin-tossing or dice-throwing. SP, by contrast, relates to the individual's own estimate (or personal opinion) of the probable outcome of a unique (non-repeatable) event -- an event for which there are no objectively determined frequencies).

The concept of subjective value (SV) differs from that of objective value (OV) in the following sense. Fixed sums of money (say \$200), or items readily convertible into fixed sums of money (a bicycle, a piano, a car, and so forth), all have relatively standard values -- i.e., have values that are known and hence

represent objective values. However, the relative value of the gain or the loss of \$200 (or of a bicycle, a piano, or a car) would be quite different for persons with annual incomes of \$20,000 as opposed to persons with annual incomes of \$5,000 in that proportionate losses or gains would differ. Thus, an outcome's SV or utility is the value of an item to a particular individual.

In sum, then, Edwards' SEU model involves a comparison of the subjective worth of alternative A versus the subjective worth of alternative B, as estimated by the summed products of the utility and subjective probability for each alternative's several potential outcomes. Research findings with situations involving these two alternatives indicate that decision making is accurately predictable according to Edwards' SEU model 55-70 per cent of the time (as compared with 50 per cent accuracy occurring strictly as a consequence of chance).

Edwards' SEU model (1954, 1961, 1965) is defined as a rationality model of decision making because decisions are presumably guided not by trial-and-error behavior, but by rational considerations, i.e., by the estimation of the utilities and probabilities associated with each possible outcome in such a way as either to maximize expected utility or to minimize expected loss.

B. Kogan-Wallach Dilemmas

A second approach to decision making under uncertainty is represented by the Kogan-Wallach dilemmas (Kogan & Wallach, 1964) and the Stoner dilemmas (1968). These situations involve a choice between alternative A, a relatively certain outcome with which are associated known modest rewards and known modest opportunities

as opposed to alternative B, a risky alternative that provides high rewards if the outcome is successful but high losses if the outcome is unsuccessful. The uncertain (risky) alternative, B, is represented as having potentially objective probabilities which are stated in terms of 1, 2, 3, 4, 5, 6, 7, 8, or 9 chances out of 10. Thus, while Edwards' situations involve unknown potential losses and gains associated with both alternatives A and B, Kogan-Wallach and Stoner situations involve a certain low-reward alternative, A, as pitted against an uncertain high-gain, high-loss alternative that has objectively stated probabilities of success (or failure) from which the person can choose.

In addition to the use of a different risk-taking instrument, the Kogan-Wallach approach involves the use of a different dependent measure. While Edwards requires that the person select the alternative yielding the "maximum expected gain," or the "minimum expected loss," the dependent measure in Kogan-Wallach and Stoner problems requires an indication of the "lowest odds a S would require for selection of the risky alternative" (Kogan & Wallach, 1964). Thus, if the risky alternative is treated as alternative B, then the only circumstance under which a person would select alternative A would be if he required 100 per cent probability (10 chances out of 10) that the risky alternative, alternative B, would lead to a successful outcome. In essence, then, the Edwards model involves a rational choice between two risky alternatives, whereas the Kogan-Wallach and Stoner situations require a choice only in terms of the level of risk taking with respect to the risky alternative, B, because the risk taker is being asked to indicate the lowest

minimum odds for success (i.e., the greatest degree of risk) that he would be willing to take and still select alternative B.

C. The Utilities' Ratio Model of Burnstein et al. and of Vinokur

Yet another approach to risk taking is to be found in the Burnstein-Vinokur conceptualization of rational risky decision-making, as measured in terms of the Kogan-Wallach dilemmas. Edwards' SEU model entails subjective probability and utility as its independent variables, and choice of the alternative with the maximum expected utility or the minimum expected loss as its dependent variable. For Burnstein and Vinokur, however, utility alone is the independent variable; and the selection of a particular level of risk, while presented as objectively stated odds (OP), is actually conceptualized both as the dependent variable and as the person's minimum subjective probability (SP). Thus, for Burnstein and Vinokur, the role of subjective probability is not conceptualized as an independent variable that acts conjointly with utility to determine the individual's risk preference. Instead, SP is defined as equal to or greater than the individual's minimum odds for risk taking ($SP \geq p_m$) and is thus omitted as an independent variable.

The Burnstein-Vinokur rationality model of risky decision making also differs from the Edwards model in the treatment of utility. Burnstein and Vinokur treat utility as a "ratio of three utilities" -- the three utilities associated with three possible outcomes: (1) the utility associated with a successful outcome in the uncertain and risky alternative (U_s); (2) the negative utility associated with an unsuccessful outcome in the risky

alternative (U_f); and (3) the utility associated with the certain but less rewarding conservative alternative (U_c). The utilities' ratio is calculated as follows:

$$\hat{p} = \frac{U_c - U_f}{U_s - U_f}$$

On the basis of empirical findings derived from several of their own experiments, Burnstein and Vinokur contend that, in the Kogan-Wallach and Stoner dilemmas, risk taking (p_m) can be predicted from $\hat{p}$ (p_m and $\hat{p}$ were found to be positively correlated in six different experiments). Thus for Burnstein and Vinokur, risk preference (p_m) is a function of the person's utilities ratio ($\hat{p}$):

$$p_m \simeq \hat{p}$$

However, the experiments of these investigators did not yield unequivocal support for their revision of the Edwards rationality (SEU) model of individual risk taking. Indeed, Vinokur (1971) found no high correlations whatsoever (only poor or moderate ones) while Burnstein *et al.* (1971) found that 75 per cent of his Ss showed moderate or high positive correlations, but 25 per cent did not.

D. Limitations of the Burnstein-Vinokur Model

The limited applicability of the Burnstein-Vinokur equation may stem from its failure to take into account individual differences. Evidence of such differences actually derives from the very studies that the authors themselves undertook to establish the validity of their model (Burnstein *et al.*, 1971; Vinokur, 1971).

The Burnstein-Vinokur rationality model of risky decision making in Kogan-Wallach dilemmas appears to be predicated upon the following four assumptions, all of which imply a disregard of individual differences:

- (1) almost all persons are rational
- (2) all rational persons should value the utility of a success in the risky alternative (U_s) more highly than they value the conservative alternative (U_c), and they should value a failure in the risky alternative (U_f) less highly than either of the other two possible outcomes such that

$$U_s > U_c > U_f$$

- (3) all rational persons' subjective probability (SP) should be equal to or greater than their utilities' ratio ($\hat{p}$)

$$SP \geq \frac{U_c - U_f}{U_s - U_f} \geq \hat{p}$$

- (4) all rational persons' subjective probability should be equal to or greater than the minimum odds for success that they require in order for them to be willing to select the risky alternative

$$SP \geq p_m$$

This equation, when expressed in terms of risk-taking level, actually ~~signifies~~ that SP must be equal to or less great than the S's level of risk taking.

Based on these four assumptions, the model then asserts that the risk preference of rational persons will be predictable strictly from their utilities' ratio. In other words, for Burnstein and Vinokur, all rational Ss whose SP is equal to or less great than their actual risk level will select their degree of acceptable

risks solely in terms of the utility (the subjective value) of three potential outcomes:

$$p_m \simeq \hat{p}$$

Objections to the Burnstein-Vinokur use of a single model to predict the risk taking of almost all persons derives from two considerations. Firstly, experimental evidence deriving from their own studies indicates that correlations between p_m and $\hat{p}$ are often only moderate or even poor. For example, while Burnstein et al. found that 75 per cent of their Ss exhibited high $p_m - \hat{p}$ correlations ($r = .61-1.00$), the remaining 25 per cent of his Ss manifested only moderate $p_m - \hat{p}$ correlations ($r = .21-.30$), poor $p_m - \hat{p}$ correlations ($r = .00-.20$) or inverse $p_m - \hat{p}$ correlations ($r \leq -.30$). Vinokur's three experiments yielded no high correlations and only moderate or poor ones. In one experiment, the $p_m - \hat{p}$ correlations ranged from .37-.53; in a second experiment, from .29-.54; and in a third experiment, correlations for four situations were extremely low ($r = .06$, $r = .09$, $r = .12$, and $r = .18$) with five other $p_m - \hat{p}$ correlations representing only modest ones ($r = .28$, $r = .29$, $r = .30$, $r = .32$, $r = .40$)

There is a second basis for questioning the universal applicability of the Burnstein-Vinokur approach. The Burnstein-Vinokur model is adduced as a "rationality" model -- a model which can predict "rational" risk taking. It further assumes that almost all persons are "rational." Yet, the research literature suggests that many persons are not at all rational. In particular, studies concerned with locus of control indicate that "nonrationality" in risk taking and in other behaviors may arise as a function either

of differences in locus of control or of the combined effects of locus of control and of situational factors.

As the Burnstein-Vinokur model attempts to explain only "rational" decision making under uncertainty, and as many persons have exhibited seemingly "nonrational" behavior in a number of different situations, the Burnstein-Vinokur model cannot be expected to constitute an adequate predictor of the risk taking of all persons.

Before discussing models of risk taking that may account for "nonrational" as well as "rational" risk taking, let us examine the empirical indications of differences in rationality in risk-taking which arise as a seeming consequence of locus of control and of situational differences.

II Locus of Control and Its Relationship to Variables That May Influence Risk-Taking Levels and Processes

Locus of control is a construct that derives from Rotter's Social-Learning Theory (1954). It refers to the degree to which an individual perceives outcomes (and reinforcements) as resulting from his own actions -- and thereby as being subject to his own personal or internal control -- or, alternatively, to the degree to which he perceives outcomes (and reinforcements) as being determined by external forces (by powerful authority figures, the fates, chance or luck) and thus as being determined by external control. As conceptualized by Rotter, locus of control represents a generalized expectancy, which is measured by responses to a 23-item Rotter inventory, wherein each item pairs an internally-controlled

statement with an externally-controlled one. This generalized expectancy of success or failure in "personal ability to control outcome" is thought to mirror the cumulative effect of a host of the person's past experiences in which personal or else external control seemed to him to be determining outcomes.

Now, in considering a person's locus of control, one is actually considering his generalized expectancy of success or failure and hence, by inference, his level of self-confidence with respect to determining situational outcomes by virtue of his own skill or effort.

Over 300 studies have examined the relationship of locus of control to a wide range of personality variables, perceptions, attitudes, and behaviors. Of these studies, only those relating to differences in expectations of success, self-confidence, rationality, and risk-taking in skill and chance tasks will be reviewed, as it is these attitudes and behaviors that are expected to explain differences in risk-taking levels and processes as a function of locus of control.

A. Locus of Control and A Success or Failure Orientation

The construct of locus of control is concerned with a generalized expectancy that one can be successful or unsuccessful in controlling situational outcomes. Persons having a generalized expectancy of success should presumably perceive less risk for themselves in uncertain situations than would be the case for persons having a generalized expectancy of failure.

Direct evidence of differential orientations toward success and failure derives from a study by Efran (1963), who found that

in experimentally induced successes and failures, internally controlled Ss (ICs) had a marked tendency to recall only successes whereas externally controlled Ss (ECs) exhibited a predisposition to recall their failures. In a similar vein, a study of peer-group influence upon a person's self-evaluation by Jones and Schrauger (1968) revealed that when presented with equal numbers of positive and negative evaluations of themselves, ECs agreed with a significantly greater number of the negative self-evaluations than did ICs. Findings consistent with those just cited were obtained in an investigation by Phares, Ritchie and Davis (1968), which indicated that ECs recalled significantly more negative information provided by personality assessments than did ICs.

Attitudes toward threatening information afford indirect evidence of a person's orientation toward success or failure; for a tendency to focus on threatening information suggests a heightened fear of failure, whereas a predisposition to ignore or repress awareness of threats implies an inclination to focus on the positive aspects of a situation. A number of studies indicate that ECs are highly sensitive to threatening aspects of situations whereas ICs are not. For example, Lipp, Kolstoe, James and Randall's (1958) study of perceptual defense revealed that the thresholds of physically disabled ECs to tachistoscopic presentations of physically disabled persons were considerably lower than those of ICs. Evidence of sensitization to threatening information by ECs as opposed to a denial or repression of such information by ICs (Tolor & Reznikoff, 1967; and Altrocchi et al., 1968) also suggests that ECs focus on negative aspects of a situation whereas ICs attend to the positive

aspects.

Another piece of indirect evidence of differential expectations of success derives from several studies of ICs and ECs with respect to their degree of anxiety and to whether their anxiety is facilitative or inhibitory. Responses to the Manifest Anxiety Scale (MAS) and to the Mandler Test Anxiety Scale (TAS), both of which show significant correlations with the Rotter I-E scale (Watson, 1967; and Ray & Katahn, 1968), indicated that ECs are significantly more anxious in general situations as well as in academic ones (Watson, 1967; Platt & Eisenmann, 1968; Ray & Katahn, 1968, and Hountras & Scharf, 1970). Furthermore, responses to the Alpert-Haber Facilitating-Debilitating Test Anxiety Questionnaire indicated that ECs experience debilitating rather than facilitating anxiety (Butterfield, 1964; and Feather, 1967).

These empirical findings which show ICs as low-anxious and ECs as high-anxious -- particularly in debilitating anxiety -- afford further indications that the nonanxious ICs would direct their thoughts toward a successful situational outcome whereas ECs would be more preoccupied with the possibility of an unsuccessful outcome.

B. Locus of Control and Levels of Self-Confidence

A person's degree of self-confidence is expected to influence his level of risk-taking and, perhaps, the factors underlying his risk preference.

Indirect evidence of differing degrees of self-confidence as a function of locus of control are found in studies of independence and of conformity wherein conforming attitudes and behaviors represent attitudinal and behavioral changes stemming strictly from susceptibility

to the influence of high-status individuals or authoritarian figures or group pressures. For example, a study which compared the responses of ICs and ECs to the Barron Independence-of-Judgment scale showed that ICs exhibited significantly greater confidence in their own judgments than did ECs and that, indeed, ECs tended to be quite low in self-confidence (Odell, 1959). In an Asch-type study of conformity to group pressure, ECs wagered less money than did ICs when compelled to make independent judgments (Crowne & Liverant, 1963). Finally, in an attitude-change study concerned with governmental budgeting, ECs evidenced greater conformity than did ICs to the opinions expressed by high-status individuals (Ritchie & Phares, 1969).

These and other studies suggest a correlation between degree of internality and level of self-confidence; the nonindependent, conforming behavior of ECs suggests relatively low self-confidence, whereas the independent, nonconforming and information-oriented behavior of ICs suggests relatively high self-confidence.

C. Locus of Control and the Acquisition and Utilization of Information In Decision Making

Rational decision making implies a set of behaviors that includes acquisition and consideration of all available information, as well as a conscious weighing of the probabilities and relative values of all alternatives (Edwards, 1961, 1965).

A number of empirical studies suggest that ICs and ECs make differential use of information. For example, tubercular ICs sought more information about their condition and prognosis than did ECs (Seeman & Evans, 1962), and IC reformatory inmates made

more detailed inquiries about the possibilities for parole than did ECs (Seeman, 1963).

In situations described as skill-determined or ambiguous, ICs sought out and considered more information than did ECs prior to their experimental task of attempting to influence the attitudes of others with respect to the Vietnam war (Davis & Phares, 1967); and in an experimental situation requiring that Ss evaluate the suitability of occupations and of female companions for men, ICs showed greater effective utilization of information than did ECs, as indicated by more accurate assessments and greater utilization of information in arriving at their assessments (Phares, 1955).

Differential utilization of information is also suggested by investigations showing that ICs are more apt to exhibit behavioral changes following exposure to relevant information. Thus, ICs were more apt to utilize some form of birth control than were ECs after both groups had been exposed to information on birth control (MacDonald, 1970); ICs were more inclined than ECs to discontinue smoking after exposure to the surgeon general's report on the correlation between smoking and cancer (James, Woodruff & Lerner, 1965; Platt, 1969); and ICs altered their attitudes about governmental budgeting methods strictly on the basis of relevant new information, whereas attitude change by ECs was unrelated to new information and only occurred as a consequence of conformity to high-status or authoritarian figures (Ritchie & Phares, 1969).

D. Locus of Control and Differential Responses to Skill And Chance Tasks

A major basis for distinguishing the differential responses of ICs and ECs to skill and chance tasks derived from a study by Phares (1957), who discovered that, among a large sample of Ss, skill and chance tasks were associated with substantially different behavioral patterns.

Chance tasks are ones involving gambling, guessing, or situations defined as chance-determined. Skill tasks refer either to a specific type of task with which skill is normally associated (e.g., color or line-matching tests, dart-throwing, arithmetic problems, or simple games) or with ambiguous tasks that are defined as skill-determined.

In situations involving a series of trials, "expectations of personal control" were inferred from the amount of money or tokens an S was willing to wager on his probability of being correct on the next succeeding trial. Phares noted that in skill situations the expectation of control over outcomes, as inferred from the amount of money wagered, increased following a success and decreased following a failure. By contrast, in chance situations, responses were either relatively unchanged following a success or a failure, or response changes indicated the operation of the gambler's fallacy, i.e., of a simplistic view of the laws of probability which led to increased monetary wagers following a failure and decreased monetary wagers following a success.

On the basis of these and other studies, a perception of personal or internal control came to be associated with the

behavior characterizing respondents in skill conditions and a perception of nonpersonal or external control came to be identified with the behavior characterizing respondents in chance conditions. It was then noted that the behavior of ICs in many tasks resembled that of persons responding to skill tasks, while the behavior of ECs in those same tasks resembled that of persons responding to chance tasks.

Later studies that examined differential responding of ICs and ECs to different kinds of tasks (Rotter & Mulry, 1965; Davis and Phares, 1967; Watson & Baumel, 1967; Lefcourt, Lewis & Silverman, 1968; and Julian & Katz, 1968) suggested that three types of tasks-- skill-determined, ambiguous and chance-determined ones -- were distinguishable in terms of the amount or quality of objective indications for personal or nonpersonal control that inhered in the tasks themselves. It became evident that skill-determined situations imply the possibility of some personal control over outcomes through the exercise of personal ability and effort; that, ambiguous situations lack clear-cut evidence as to whether situations are controllable by personal effort and ability; and that chance situations provide strong indications that outcomes are controllable only by external factors -- by the laws of probability, by chance, or by other external forces.

Behavior indicating a perception of personal control was inferred from one or a combination of indices: (1) appropriate shifts in Level-of-Aspiration tasks -- i.e., indications of decreased aspirations following a failure and of increased aspirations following a success (Rotter, 1954; Lefcourt, Lewis & Silverman, 1968); (2) consistent, nonvariable, and nonrandom responses in tasks involving minimal intertrial differences

(Lefcourt & Ladwig, 1965); (3) the selection of moderate or conservative risks in situations whose outcome was partially uncertain (Julian, Lichtman & Ryckman, 1968; and Liverant & Scodel, 1960); (4) an effort to acquire and utilize relevant information in situations where the accuracy of a decision was dependent on acquisition and utilization of information (Seeman & Evans, 1962; Seeman, 1963; Davis & Phares, 1967; Phares, 1968; and MacDonald, 1970); (5) spending sufficient time in assessing a problem before arriving at a decision so as to minimize the possibility of making errors (Julian & Katz, 1968; Lefcourt, Lewis & Silverman, 1968); and (6) making choices that maximize the expectancy of gain and/or minimize the possibility of loss (Nadien, 1970).

By contrast, behavior indicating a perception of non-personal control was inferred from the absence of the previously cited indications of personal control.

Now, if tasks are distinguished by clear-cut objective indications of differing degrees of opportunity for personal control over outcomes, do individuals invariably perceive such objective indications accurately? Do people match their own personal expectations of control over outcomes with the objective possibilities or non-possibilities for such control?

The research literature dealing with responses to skill, chance and ambiguous situations suggests that individuals differ with respect to their capacity for recognizing such differences: thus, behaviors are a joint function of a situation's objective characteristics and the individual's perception of that situation's characteristics.

In their responses to skill-determined tasks, ICs and ECs exhibit different behavioral patterns; the ICs' responses imply a perception of the tasks as being susceptible of personal control, whereas the ECs' responses suggest a perception of the tasks as denying personal control. Thus, in the experiments previously noted in which the situations were defined as skilled, ICs were distinguished from ECs in terms of utilizing substantially more information, in devoting more time and attention on the tasks and in showing greater accuracy (Davis & Phares, 1967; Julian & Katz, 1968; Lefcourt, Lewis & Silverman, 1968; Rotter & Mulry, 1965; Watson & Baumei, 1967). In skill-determined risk-taking situations -- ones involving jazz music (Lefcourt & Ladwig, 1965), dart-throwing (Lichtman & Julian, 1964) color- and line-matching (Phares, 1957) -- ICs exhibited moderate and consistent responses whereas ECs showed highly variable behavior, randomly fluctuating from one trial to the next between excessively risky or excessively conservative positions. Thus, skill-determined situations apparently elicit behaviors that suggest a perception of personal control over outcomes among ICs but a perception of nonpersonal control among ECs.

In terms of objective characteristics, chance-determined tasks represent ones in which outcomes are determined by external forces as they are situations that involve gambling, guessing, or a task described as chance-controlled. These situations elicit several different patterns of responses. In one risk-taking study, ICs were much more conservative than were ECs (Liverant & Scodel, 1960) whereas in another experiment it was ECs who

were more cautious (Baron, 1968). In another three studies, it was the ECs (not the ICs) who were displaying greater accuracy (Watson & Baumei, 1967), more task-relevant behavior (Lefcourt, Lewis & Silverman, 1968) and more moderate and consistent risk taking (Lefcourt, 1965). However, the apparently thoughtful, moderate and consistent behavior of ECs may have resulted from a perception of outcomes as determined not by personal control, but by the laws of probability; for the strategies used by the ECs were consistent with "playing the odds."

In most chance-controlled situations, ICs and ECs showed essentially similar responses -- most often, responses that were suggestive of a perception of noncontrol. Both ICs and ECs failed to seek out and carefully assess information (Rotter & Mulry, 1965; Davis & Phares, 1967; Julian & Katz, 1968); and both ICs and ECs exhibited unusual shifts and greater intertrial variability in Asch-type experiments (Lefcourt, Lewis & Silverman, 1968) and in risk-taking tasks (Lefcourt & Steffy, 1970; Minton & Miller, 1969).

While the impact of locus of control upon response patterns in chance-determined situations is not as clear-cut as in the case of skill-determined ones, most of the studies suggest that both ICs and ECs perceive chance-determined situations as ones in which they lack personal control.

In summarizing the differential responses of ICs and ECs to skill and chance situations, the following general pattern emerges: (1) in skill situations, ICs exhibit behaviors reflective of a perception of personal control, but ECs manifest responses suggestive of a perception of nonpersonal control; (2) in chance situations, in most cases both ICs and ECs give evidence of a perception of nonpersonal control.

In view of these differential patterns of responding as a function of situational and locus-of-control differences, risk-taking processes are expected to be as follows: ICs are expected to exhibit one set of behaviors in skill situations and another set in chance ones; ECs are expected to exhibit similar behaviors in both skill and in chance situations; and the behavior of ICs in chance situations is expected to resemble that of ECs in both skill and chance situations. In other words, it is only ICs in skill situations who are expected to exhibit responses reflective of a perception of personal control.

E. Locus of Control and Rationality

Rationality implies a set of behaviors which includes acquisition and careful utilization of all available information, nonrandom behavior, and a conscious weighing of the probabilities and the relative values of all alternatives with a view to maximizing the expected utility (Edwards, 1961, 1965); and the previously cited research studies suggest that "rational behavior" implies a perception of personal control over outcomes.

Now, a review of empirical findings relating to ICs' and ECs' differential responding to skill- and chance-determined situations suggests that (1) truly rational behavior is feasible only in skill situations because only skill situations possess objective indications that outcomes are susceptible of some degree of personal control through utilization of information and weighing possibilities; and (2) only ICs' responses to skill situations give evidence of consistently rational behavior. The behavior of ECs in skill situations and of both ICs and ECs in chance situations reflects nonrational

behavior and implies a perception of non-personal control, as indicated by the failure to acquire and utilize relevant information and the display of random behavior, unusual shifts, and relatively high intertrial variability.

To the best of this investigator's knowledge, no single researcher has explored the differential applicability of the Burnstein-Vinokur "rationality" model of risk taking in Kogan-Wallach situations as a function of individual differences in locus of control. While Baron (1970) examined ICs' and ECs' levels of risk taking in Kogan-Wallach situations, he did not assess their decision-making processes. On the other hand, while Burnstein and Vinokur did examine decision-making processes in the Kogan-Wallach dilemmas, they did not consider differences in decision-making processes as a function of locus of control. Their failure to predict the risk taking of all Ss may therefore have been attributable to differences among their Ss with respect to locus of control.

In view of the previously cited research indications that rational behavior appears to be associated with perceived control over outcomes and that rational behavior is characteristic only of ICs in skill-determined situations, it seems logical to assume that a rationality model of risk taking -- the Burnstein-Vinokur model -- will be a better predictor of the risk taking of ICs in skill situations than of either ICs in chance situations or of ECs in either skill or chance situations. By the same token, in view of the research indications that nonrational behavior appears to be associated with a perception of nonpersonal control over outcomes and that non-rational behavior is characteristic of

ECs in skill and chance situations and of ICs in chance situations, it seems logical to expect that in these cases the Burnstein-Vinokur model might be a less good predictor of risk taking than would some other model.¹

III Methodological Issues Relating to the Burnstein-Vinokur Model

There are methodological limitations that inhere in the Burnstein-Vinokur model, both in terms of its application to the original Kogan-Wallach situations and also as a model that ostensibly measures only "rational" risk taking.

1. The Burnstein-Vinokur model is one which has been applied to Kogan-Wallach dilemmas, risk-taking situations in which the respondent is compelled to opt for the risky alternative because the risk taking measure is that of "choosing the minimum odds that are required in order for the person to advise selection of the risky alternative." The highest odds that the respondent can select are "9 chances out of 10." By denying the right to require "10 chances out of 10," the S is denied the opportunity of opting for the conservative alternative.

In real life, when confronted with situations comparable to the Kogan-Wallach dilemmas, people have the right -- and often exercise the right -- of selecting a conservative choice rather than a risky one. Thus, if hypothetical situations are used to predict a person's real-life responses to risky situations, it

¹In their present form, Kogan-Wallach situations represent ambiguous or chance-determined ones (with the exception of one dilemma that was perceived as a skill-determined one). Thus, Burnstein and Vinokur examined risk-taking processes only in terms of ambiguous and chance-determined situations, and not in terms of clearly skill-determined and chance-determined ones.

would be advisable to render the hypothetical situations as comparable to real-life ones as is possible. To achieve this end, the Kogan-Wallach risk taking measure should be restated in such a way as to permit the respondent to indicate his preference for the conservative alternative by allowing him to opt for "10 chances out of 10" as his "minimum odds required for choosing the risky alternative."

2. In applying their model to the Kogan-Wallach dilemmas, Burnstein and Vinokur used situations that do not directly measure the respondent's own risk-taking preference. For the dependent measure requires that the subject indicate the "minimum odds that would be required in order to advise Mr. X. to select the risky alternative." Now, there is often a discrepancy between the advice one gives to others and the advice one gives to oneself. Therefore, a risk-taking measure that is designed to reflect the respondent's own risk preference should be expressed in the personal form; i.e., the respondent should be asked to indicate "the minimum odds for success that he would require for himself in order to be willing to select the risky alternative." This second proposed change would also decrease the hypothetical nature of the Kogan-Wallach dilemmas and thereby permit a more accurate indication of the respondent's willingness to take risks.

3. One aspect of the Burnstein-Vinokur model relates to the conceptualization of utilities. Burnstein and Vinokur examined three utilities -- U_s , U_f , U_c -- only as a "ratio of three utilities," but they did not examine each utility as a possible separate determinant of risk taking. It is conceivable that, for some "rational"

persons, one particular utility rather than a ratio of the three utilities would represent a better predictor of risk taking -- even for those Ss for whom the Burnstein-Vinokur utilities' ratio successfully predicts risk taking.

4. Another limitation associated with the Burnstein-Vinokur model relates to its expectation that the risk taking of all "rational" Ss is predictable strictly in terms of utilities. The Burnstein-Vinokur position that a person's risk taking in Kogan-Wallach dilemmas is predictable solely from his utilities' ratio stemmed from the assertions that, for rational persons (persons for whom $U_s > U_c > U_f$) for whom subjective probability is equal to or less great than his level of risk taking, (a) a S's subjective probability should also be equal to or less great than his utilities' ratio, and (b) a S's utilities' ratio alone should predict his risk taking level ($p_m \simeq p$). However, having made these assertions, Burnstein and Vinokur never explored experimentally the possible relationships between subjective probability and risk taking; i.e., they never ascertained whether or not SP was indeed equal to or less great than the level of risk taking.

Burnstein and Vinokur not only disregarded the possible role of SP- p_m relationships; they also ignored the possible influence upon risk taking of a more relevant variable: an individual's subjective expectancy of success. Now, subjective probability (SP) and subjective expectancy of success (p_s) are two subtly different constructs. As applied to the Kogan-Wallach situations, SP is the individual's personal opinion as to whether some unknown person, Mr. X., would be likely to experience a successful outcome given that he selected the risky alternative. By contrast, a person's

p_s is the individual's personal opinion as to his own likelihood of experiencing a success in the risky alternative if he were the central figure confronted with that risky venture.

Personal opinions concerning the subjective likelihood for others in general (SP) is not necessarily identical with personal opinions concerning subjective likelihood that one applies to oneself (p_s). When estimating the chances of others, one tends to think of some "typical human being" (or some shadowy individual who is a composite of persons with whom one has been acquainted). Self-concepts do not necessarily coincide with concepts of typical beings or a composite figure. Expectations of success for oneself (p_s) could coincide with expectations of success for some unknown other (SP) only if that unknown other were perceived as highly similar to oneself. Given the abundant research evidence indicating individual differences in person perception, it seems unlikely that all persons would perceive unknown others as being highly similar to themselves in ability, expectation of success, and motivation. Thus, expectancies of success for unknown others cannot be regarded, at least for some persons, as identical with subjective expectancy of success for oneself; and, by the same token, relationships between subjective expectancy of success and risk taking cannot be assumed to be the same as relationships between subjective probability and risk taking; i.e., $p_s - p_m$ relationships may differ from SP - p_m relationships.

IV Locus of Control and the Differential Applicability of the Burnstein-Vinokur Model

It was previously suggested that variations in locus of control and of situational factors could lead to differences in rationality, which in turn could be responsible for the differential applicability of the Burnstein-Vinokur equation as an explanation of risk-taking preferences. However, the way in which rationality differences might cause the Burnstein-Vinokur model to apply more readily to some Ss than to others was not identified. We are now suggesting, on a purely exploratory basis, that subjective expectancies, like rationality and nonrationality, may vary as a function both of locus of control and of situational differences.

A. Locus of Control and Differential Expectancies of Success in Skill-Perceived and Chance-Perceived Situations

As previously discussed, ICs and ECs differ significantly in their degree of anxiety, their general levels of self-confidence, and their attitudes toward success and toward threatening information. If ICs have a success orientation, a high degree of self-confidence, a tendency to disregard threatening aspects of a situation and low anxiety, is it not reasonable to expect that in skill situations -- in situations perceived as permitting personal control over outcomes -- that the ICs' subjective expectancy of success would be higher than that of ECs' -- i.e., higher than that of persons who have a failure orientation, a low degree of self-confidence, high anxiety and a tendency to be highly sensitive to

and fearful of threatening information?

On the other hand, in chance situations -- in situations perceived as being nonsusceptible of personal control -- is it not reasonable to expect that the ICs' normally high self-confidence and success orientation would not influence their responses because their rational attitudes would lead them to recognize that chance situations are obviously controlled by external forces? Thus in chance situations -- situations in which both ICs and ECs usually exhibit behaviors indicative of a perception of personal noncontrol -- both ICs and ECs are expected to exhibit the same levels of subjective expectancy. In sum, subjective expectancy of success is expected to be higher only for ICs only in skill situations.

B. Locus of Control and Differences in Risk-Taking Processes in Skill-Perceived and Chance-Perceived Situations

If the subjective expectancy of success of ICs in skill situations is expected to be quite high because of the ICs' perception in skill situations of personal control over outcomes, is it possible that p_s in such cases might be so high as to be irrelevant as a direct determinant of risk taking, in which case risk taking could be predicted solely by utilities -- i.e., risk taking could conform to the Burnstein-Vinokur model of " $p_m \simeq \hat{p}$ "? On the other hand, if situational outcomes are perceived as controllable largely by external and nonpersonal factors, might not subjective expectancy of success be considerably lower and therefore operate as a variable influencing preferred risk levels? If so, then for ECs in skill and chance situations and for ICs in chance situations, the Burnstein-Vinokur equation as a predictor

of risk taking might be surpassed by a model in which risk preference would be determined by the joint influence of p_s and utilities.

C. Locus of Control and Differential Relationships between Subjective Expectancy of Success and the Utilities

Existing theories of risky decision-making are based on the contention that risk taking reflects, either directly or indirectly, the operation of both p_s and utilities. This author therefore assumes that risk taking in Kogan-Wallach situations should also reflect, either directly or indirectly, the influences of both a person's p_s and of his utilities, even in those situations in which utilities alone can predict risk preference. Thus, for those persons for whom the Burnstein-Vinokur equation does not afford a good predictor of risk preference, p_s might act conjointly with utilities to determine risk preference; but for those Ss for whom the Burnstein-Vinokur equation provides a good prediction of risk preference, p_s might operate in two ways: (1) as previously mentioned, p_s might be so high as to be irrelevant as a direct determinant, so that utilities alone could dictate risk preference; and (2) p_s might correlate with some or all of the individual utilities (U_s , U_c , U_f) as well as with the utilities' ratio ($\hat{p}$). The latter condition might prevail (a) where relationships between utilities and subjective expectancies are initially consistent; (b) where, before decision making, utilities are changed so as to be congruent with subjective expectancies as might be the case for the "realist" seeking cognitive consistency; or (c) where, before decision-making,

subjective expectancies are altered so as to conform to utilities, as would be the case for those for whom "the wish is father to the thought."

These possible explanations, arrived at on purely logical and non-empirical grounds, serve as the basis for an exploratory investigation of p_s relationships with utilities; for it is hoped that the existence of p_s -utilities relationships might reconcile the Burnstein-Vinokur prediction of "utilities determining risk taking" with the theoretical position that "risk preference reflects the operation of both utilities and p_s ." Among S_s for whom utilities alone can predict risk level, evidence of p_s -utilities relationships should be reflected in high p_s - U_s correlations and/or high inverse p_s - U_c , p_s - U_f , or p_s - $\hat{p}$ correlations. However, for S_s for whom risk preference is best predicted by the joint influence of p_s and utilities, such p_s -utility correlations are not expected to emerge.

V Hypotheses

1. This experiment will seek to establish whether individual differences in locus of control do indeed account for the differential applicability of the Burnstein-Vinokur equation of the utilities' ratio ($\hat{p}$) correlated with risk-taking preference (p_m)

$$p_m \simeq \hat{p}$$

Explicitly, from the prior discussion, it is predicted that the relationship will be stronger for the ICs than for ECs.

2. In this study, which provides for an examination of risk-taking in both skill-determined and chance-determined situations, it is predicted that the $p_m - \hat{p}$ relationship will vary between skill-determined and chance-determined situations and that the ICs and ECs may differ in their response to the slightly revised chance-determined Kogan-Wallach situations and to the radically revised skill-determined Kogan-Wallach-Nadien situations.

In the absence of any prior research on this issue of risk-taking differences as a joint function of both locus-of-control and of situational differences, and in view of the prior discussion indicating that only ICs appear to be "rational" in situations in which personal control over outcomes appears to be feasible (i.e., in skill situations), it is expected that the Burnstein-Vinokur "rationality" model of risk-taking will best explain the response of ICs in skill situations.

3. In those cases where, as indicated in hypotheses 1 and 2, it is thought that the Burnstein-Vinokur model may not be a good predictor of risk-taking, relationships will be sought between

risk-taking (p_m) on the one hand, and the variables of subjective expectancy of success (p_s), the utility of a success in the risky alternative (U_s), the negative utility of a failure in the risky alternative (U_f), and the utility of a relatively guaranteed outcome provided by choice of the conservative alternative (U_c).

Specifically, it is expected that persons in situations where they perceive "no personal control" -- for ICs in chance situations and for ECs in skill and chance situations -- the ability of the utilities' ratio ($\hat{p}$) to predict risk-taking (p_m) may be surpassed by subjective expectancy of success (p_s) as a predictor of risk-taking (p_m) and/or by one of the utilities (U_s , U_f , U_c) as a predictor of risk-taking (p_m).

Chapter III

METHOD

Exploratory Study

Before describing the main experiment, this chapter will detail the essential steps which led to it. These include an exploratory study, the development of modified Kogan-Wallach situations, and a pilot study to assess the perception of these revised situations by individuals who differ with respect to locus of control.

Inasmuch as the existing research literature did not indicate whether the Kogan-Wallach choice dilemmas represented skill-determined, chance-determined or ambiguous situations, the first step was to ascertain how persons perceived the Kogan-Wallach situations.

The first basis for identifying the Kogan-Wallach choice dilemmas as skill-determined, chance-determined, or ambiguous was the assessment by 10 male judges (three lawyers, three doctors, two certified public accountants and two business executives) of "the amount of personal control over outcomes" they perceived, as measured along a scale ranging from 0 to 10. In this scale "0" represented the complete absence of ability to control outcomes through personal ability and effort; "10" represented complete control over outcomes through personal ability and effort; and

"5", the midpoint of the scale, presented 50 per cent chance of controlling outcomes through personal ability and effort. This author arbitrarily decided that scores of 0.00 to 4.49 would represent assessment of the situations as "chancy;" scores of 4.50 to 5.49 would represent assessments of the dilemmas as ambiguous; and scores of 5.50 to 10.0 would represent assessments of the dilemmas as being skill-determined.

As noted in Table 1, Appendix A, the mean responses of the ten male judges to the original Kogan-Wallach dilemmas suggested the following: only one situation was being perceived as skill-determined (No. 6); five of the situations were being perceived as ambiguous (Nos. 1, 4, 9, 11, 12); and six of the situations were being perceived as chance-determined (Nos. 2, 3, 5, 7, 8, 10).

II Revision of Kogan-Wallach Dilemmas

Two major substantive changes and two major methodological changes were introduced into the Kogan-Wallach dilemmas because of the following specific aims:

(1) The first aim of this study was to ascertain whether differences in locus of control would be reflected in differing perceptions of personal control in three types of revised Kogan-Wallach situations.

Specifically, the aim was to ascertain whether both ICs and ECs would perceive clear-cut differences in the amount of personal control in situations which, objectively speaking, permit differing degrees of control through personal effort and ability. In other words, inasmuch three types of situations (skill-determined, ambi-

guous, and chance-determined ones) possess inherently differing degrees of actual personal control, it was important to discover whether ICs and ECs really perceive the differences in the amount of personal control that is theoretically feasible in these objectively different types of situations.

In order to investigate task perception as a function of locus of control, equal sets of four skill-determined, four ambiguous and four chance-determined tasks were needed. This investigator therefore created: (a) three new skill situations by introducing elements of skill into three ambiguous situations (situations Nos. 1, 4, and 11); and (b) two additional ambiguous situations were created from two chance-perceived situations (situations Nos. 7 and 8). The following seven of the original Kogan-Wallach situations remained unchanged, but only with respect to task perception; all four chance-determined dilemmas (situations 2, 3, 5, and 10), two ambiguous dilemmas (situations 9 and 12), and one skill dilemmas (situation No. 6).

As a consequence of changes introduced in the above-cited situations, dilemmas Nos. 1, 4, 6, and 11 formed the four skill-determined situations; dilemmas Nos. 7, 8, 9, and 12 formed the four ambiguous situations; and dilemmas Nos. 2, 3, 5, and 10 formed the four chance-determined situations.

(2) A second aim was to reduce ambiguity associated with the utility of each outcome. Therefore in each situation, greater details were given with respect to one or more of the utilities of each outcome (to the positive and negative utilities associated,

respectively, with a successful or an unsuccessful outcome following selection of the risky alternative, or with respect to the negative utility of the conservative alternative).

(3) A third aim was to revise all of the situations in such a way as to make the respondent feel personally involved and thereby to reduce the hypothetical nature of the situation. The aim was to induce within the respondent the feeling that he himself would be affected by whatever decision he might make; i.e., it was hoped that the respondent would perceive that a successful outcome would afford him -- and not some vague unknown other -- tangible benefits; and that if the risky alternative culminated in a failure, he himself would have to experience the aversive consequences.

In order to achieve this goal of increasing the respondent's sense of personal involvement, the following two changes were introduced:

- (a) The respondent himself -- and not some unknown person, Mr. X -- was depicted as the central figure of each situation; and
- (b) the dependent measure of risk taking, p_m , consisted in an indication by the respondent of his own risk preference as a consequence of responding to the following instruction:

"For each situation, please indicate the lowest chance (or probability) of success that would make it worthwhile to you to select the risky alternative."

In the original Kogan-Wallach dilemmas, the dependent measure,

p_m , consisted in the respondent's "advice to Mr. X" as to the lowest minimum odds for success that he, Mr. X, should select.

(c) Because real-life decisions under uncertainty permit people to select a conservative position rather than a risky one, the risk-taking measure p_m was altered so as to permit the respondent to opt for the conservative alternative. This was achieved by giving respondents the opportunity of selecting "10 chances out of 10" before being willing to select the risky alternative by virtue of the instructions to indicate in terms of odds given (0, 1, 2, 3, 4, 5, 6, 7, 8, 9, or 10 chances in 10) those odds which most closely approximated the lowest chance of probability of success that would make it worth his while to select the risky alternative.

In the original form of the Kogan-Wallach dilemmas, "minimum odds for selecting the risky alternative were 1, 3, 5, 7, or 9 chances out of 10 (see Appendix B).

It is important to note that both the second and third changes did NOT relate to the degree of perceived "control" over outcomes -- to subjective expectancy of success or subjective probability. Consequently, these changes were not expected to affect relationships between utilities and risk-taking (although, conceivably, they could affect levels of risk-taking as well as the positive or negative valuing of outcomes).

III Pilot Study

Subjects

Twenty-nine white male psychology students were the Ss in this pilot study. These Ss were defined as ICs, ECs or ambiter-nals (persons who were partly internally controlled and partly externally controlled on the basis of their responses to Rotter's forced-choice 23-item Internal-External (I-E) Scale. Assessments of an external or an internal orientation were made on a comparative basis (i.e., in terms of their rank order). Thus, the lowest ten scorers (those with scores of 4 to 9) were defined as ICs; the highest ten scorers (those with scores from 14 to 21) were defined as ECs; and the middle nine scorers (those with scores of 10 through 13) were defined as "ambis".

Materials

1. The 23-item forced-choice Rotter I-E Scale was administered in order to ascertain each S's degree of internality or externality.

2. Twelve revised Kogan-Wallach, or Nadien-Kogan-Wallach, situations were administered. (The texts of these revised situations are provided in Appendix C.) Four of these situations were expected to be perceived as skill-determined, four were expected to be perceived as chance-determined, and four were expected to be perceived as ambiguous.

With respect to each one of the twelve Nadien-Kogan-Wallach situations, each S was asked to assess the risky alternative only with respect to the degree to which he perceived that each of two

general factors might influence a successful outcome if he were to select the risky alternative. One general factor related to his perception of the degree to which a successful outcome in the risky alternative would be influenced by his own ability or effort (or both). The other general factor related to his perception of the degree to which a successful outcome in the risky alternative would be influenced by chance or other factors beyond his own personal control.

Results and Discussion

Information relative to this pilot study's first aim -- that of ascertaining Ss' perceptions of the revised choice dilemmas, the Nadien-Kogan-Wallach situations, is found in table 1 (Appendix D), which indicates that, when examining the overall responses of all Ss, only three of the skill-determined situations were clearly perceived by all three groups (ICs, Ambis and ECs) as "skill-controlled" in terms of the arbitrary definition of skill situations (scores at or above 5.5); that only three of the chance situations were clearly perceived as chance-controlled in terms of the arbitrary definition of chance situations eliciting scores ranging from 0.0 - 4.5; and that none of the ambiguous situations were clearly perceived by all groups as ambiguous, as none of the scores fell within the range of 4.50 to 5.49. With one exception, the ambiguous situations appeared to be perceived as being skill-determined, although the variability of perception among groups (among ICs, Ambis, and ECs) was greater than that exhibited by the same Ss' responses to the arbitrarily defined skill-determined tasks and the

scores were generally lower than those elicited by the skill-determined situations.

This finding led to the decision to omit, in the dissertation study, a consideration of any of the ambiguous situations on the grounds that in these situations there was (a) higher intergroup variability in the Ss' mean responses than in any of the other situations, and (b) the absence of clear-cut evidence of a perception of these situations as ambiguous rather than skill-determined.

Because of high intrasubject variability, each S's median score of perceived ability to control outcomes through personal ability and effort for each of the three situations was ascertained and served as the basis for a frequency distribution of all Ss' median responses to each situation. Intrasubject scores were established by ascertaining each S's median response across all situations and then recording each S's response to a particular situation as a deviation from his own median. An S's overall median response on the scale of 0 to 10 was converted into a "0". Deviations on each separate situation from the S's own score of "0" were then noted, with plus (+) and minus (-) signs used to indicate the direction of deviation and with specific amounts of deviation also noted.

Table 2 provides information on each S's raw median response and his numerical deviations above and below his median after that median score has been converted into a zero score.

Table 3 shows the frequency of deviations across all Ss as estimated from intrasubject medians. The numbers enclosed in squares represent the overall median of the intrasubject median responses to a given task. The overall median responses on skill

tasks 4, 6, and 11 are all in the "plus" direction (+1, +3, +2) and the overall median responses on chance tasks 1, 3, and 5 are all in the "minus" direction (-4, -5, -2). (Overall median responses to all ambiguous tasks and to a fourth skill task, task 1, are at the zero point -- the median response -- and a fourth chance task, task 10, scores in the plus direction.)

It was decided that a second basis for inclusion of skill and chance situations in the final dissertation study would be only those situations in which median responses indicating perceived amount of personal control were in the appropriate direction: (a) inclusion of only those skill situations where the median response to a particular skill situation was above the overall median score for all situations-- the score of zero -- i.e., only those skill situations having plus numbers; and (b) inclusion of only those chance-perceived situations in which the median response to a particular chance situation was below the overall median score for all situations. On these grounds, as well as on the basis of mean responses to all the tasks, it was therefore decided to retain for the final dissertation study only skill situations Nos. 4, 6 and 11 and chance situations Nos. 2, 3, and 5.

Let us turn to an examination of findings relative to the first aim of this pilot study -- that of ascertaining whether individual differences in locus of control would be reflected in differing perceptions of the amount of personal control offered by each of three types of situations.

An examination of means and standard deviations noted in Table 1 (Appendix D) indicates that for given skill-determined, chance-determined and all but one ambiguous situation, the perceptions of

ICs, ECs and Ambis are not clearly different. Uncorrelated t-tests comparing ICs with ECs also indicated no significant differences in their perceptions of the skill-determined, chance-determined and ambiguous situations.

As perceptions of the three different types of Nadien-Kogan-Wallach situations (skill-determined, chance-determined and ambiguous ones) did not produce differences as a function of locus of control, we can assume that task perception of these situations represents a controlled variable.

Another major aim of this pilot study was to ascertain whether ICs and ECs would exhibit differing perceptions of each of the three types of situations. However, because only three situations were clearly perceived as skill-determined, and as only three other situations were clearly perceived as chance-determined, tests were made only among these three clearly perceived skill-determined and these three clearly perceived chance-determined situations. Examination of table 4 indicates the means, standard deviations and raw median scores on skill situations Nos. 4, 6 and 11 and chance situations Nos. 2, 3, and 5. Evidence of a significant difference in the perception of both ICs and ECs of the skill and chance situations was indicated by highly significant Wilcoxon matched pairs tests. For example, in comparing skill situation 4 with chance situation 5 -- those two situations which are closest in mean values and closest in overall median values -- a Wilcoxon matched pairs test yielded a $z = 3.845$ ($p < .00006$).

On the basis of both mean and median responses to both skill and chance situations, it seems fair to conclude that both ICs

and ECs perceive the three skill situations as being governed by personal control and also perceive the three chance situations as being governed by personally noncontrollable factors.

IV Main Experiment

Subjects

All Ss were volunteers drawn from graduate classes in counseling and guidance at Long Island University and at Fordham University. While White and Black males and females participated in the experiment, the Ss used in the dissertation study consisted of only 90 male Caucasian graduate students. The advance decision to omit from consideration females, Blacks and undergraduate students derived from the awareness that considerable variance could be expected to occur as a function of differences in sex, race and degree of educational experience. The bases for these three criteria of exclusion were as follows:

Females were excluded because the central figure in the original Kogan-Wallach dilemmas as well as in the revised Nadien-Kogan-Wallach dilemmas are males and because quite a number of the situations are much more oriented toward male interests than female ones (current changes resulting from the female liberation movement notwithstanding). Furthermore, Wallach and Kogan (1959) reported differential risk-taking with respect to certain situations as a function of sex.

The omission of Blacks was based on two considerations: one relating to the differential applicability of the Rotter I-E Scale

to Blacks and Whites and a second relating to the subject matter of the Kogan-Wallach dilemmas.

While the Rotter I-E Scale has been established as a fairly reliable and valid measure of generalized expectancies of success and failure among Whites, its reliability and validity as a measure of the locus of control among Blacks has been undermined by a study by Gurin, Gurin, Lao and Beattie (1969), which indicated the existence for Blacks of two general factors in the Rotter I-E Scale: one factor is defined as personal control, which refers to the individual's belief in his ability to control events in his own life; and the other factor is defined as control ideology, which refers to a person's "general beliefs about the role of internal and external forces in determining success and failure in the culture at large" (Gurin et al., p. 35). Because of the generally differing life history of Blacks as opposed to Whites in our culture, Blacks could be internally controlled with respect to Rotter items reflective of personal control but externally controlled with respect to the factor of control ideology -- or vice versa. The findings by Gurin et al. in a number of studies of Black populations has suggested that "this separation of personal and ideological levels is likely to be a valid...difference between Negro and White populations" (Gurin et al., p. 41).

A second reason for omitting a study of Blacks stems from the possibility that the subject matter of the risk-taking situations might be perceived differently by Blacks than by Whites inasmuch as the subject matter of these dilemmas was introduced by Stoner

(1961) for a predominantly white male population (for students at the Massachusetts Institute of Technology in 1961) and because revisions of these Stoner dilemmas by Kogan and Wallach (1964) and, later, by Nadien have not altered the basic subject matter.

For these two reasons -- the lesser degree of reliability and validity of the Rotter I-E Scale for Blacks than for Whites, and the possibility that the risk-taking dilemmas might elicit differing perceptions of personal control as a function of whether one is Black or White -- this author believed that exploration of the effects of locus of control on the perceptions and responses of Ss to the revised Kogan-Wallach dilemmas might be confounded by including a group of persons for whom the Rotter I-E Scale is less appropriate and for whom the revised Kogan-Wallach risk-taking situations might constitute a less suitable measure of skill- and chance-determined situations.

The decision to use graduate psychology students rather than undergraduate ones was prompted by the discovery that, in a pilot study of the final dissertation study, undergraduate psychology students at Hunter University and Fordham University experienced some difficulty in understanding the instruction and the measures both of risk-taking and of the utilities. Graduate students, on the other hand, indicated that they understood the instruction. It was therefore decided to sacrifice "naivete" for understanding.

In view of the seeming inappropriateness of the materials for an understanding of the possible interactive effects of locus of control and of task perception on the risky decision-making of females, Blacks and undergraduates, the Ss studied in this dissertation were

90 white Caucasian males from graduate classes in counseling and guidance at Long Island University (N=89) and Fordham University (N=1).

These 90 Ss were assessed for degree of internality on the basis of a rank-ordering of the Ss' responses to the Rotter I-E Scale, with scores marked in terms of "number of responses indicating an external orientation." The 90 Ss were then trichotomized: the 30 Ss whose scores represented the lowest one-third (scores ranging from 1-7) were arbitrarily defined as internally controlled (IC); the 30 Ss whose scores represented the middle one-third (scores ranging from 8-12) were defined as ambiterials (Ambis), as persons who lacked either clear-cut internal or external orientations; and the 30 Ss whose scores represented the highest one-third (scores ranging from 13-21) were arbitrarily defined as externally controlled (EC)¹. The mean responses of the three subgroups (ICs, Ambis and ECs) and of the entire sample are reported in Table 1, Appendix E.

As indicated in Appendix E, Table 2, the mean age of all 90 Ss was 28 years of age and the mean ages of ICs, Ambis and ECs were, respectively, 31.4, 27.5, and 25.9. At first it appeared that the ages of ICs and ECs were significantly different. However, there

¹Investigators have employed dissimilar methods of defining Ss as being ICs and ECs. While Rotter's studies and those reported in his comprehensive review (1966) normally employed a mediansplit, with ICs representing Ss below the median and ECs comprising those above the median, many other researchers have employed different criteria: Watson and Baumei (1967) defined ICs and ECs as the lower and upper 10 per cent of scorers (ICs scoring 1-4; ECs, 15-21); Liverant & Scodel (1960) defined ICs as the lower and upper one-third of scorers (ICs scoring 0-7; ECs, 16-23). Still other investigators have not specified their criteria, but ICs and ECs tend in such studies to represent clearly nonoverlapping groups. Thus, for Davis & Phares (1969), ICs scored 0-5 and ECs, 10-20; for Lefcourt et al. (1968)

was no significant correlation between age and degree of internality; and, upon examining the age ranges of each group, it was discovered that the seemingly older IC group was wholly accounted for by two members, whose ages were 50 and 61. When these two disproportionately older Ss were eliminated from the comparisons, the mean age of 28 ICs was 29.7 ($SD=7.8$), and the ostensibly significant differences between the ages of ICs and ECs vanished. Furthermore, as a subsequent analysis of the data showed that these two disproportionately older ICs responded to all dependent measures in a fashion similar to that of the remaining 28 ICs, it was concluded that age differences were not related to degree of internality.

Materials

The five sets of material consisted of a demographic questionnaire, a measure of locus of control, and three separate instruments designed to provide, for each of the three skill-determined and the three chance-determined situations, direct assessments of each S's risk preference (or level of risk-taking), his subjective expectancy of success, and his utilities.

1. Demographic Questionnaire

This questionnaire, which is reproduced in Appendix E, contained instructions for assuring anonymity as well as five questions designed to ascertain each S's identification number or names, his sex, date of

ICs scored 0-7; ECs, 8-23; for Phares (1968), ICs scored 0-12; ECs, 19-23; for Crowne & Liverant (1960) ICs scored 0-15; ECs, 16-23; and for Ritchie & Phares (1969), ICs scored 1-6; ECs, 12-17.

birth, college attendance and general field of academic and professional interest.

2. Measurement of Locus of Control

Rotter's 29-item forced-choice Locus-of-Control (I-E) Scale was used to measure the subjects' degree of internality or externality. This scale, also reproduced in Appendix E, comprised 6 buffer items and 23 items consisting of two paired statements, one representing a sentiment indicating an external orientation, the other representing a sentiment indicating an internal orientation. The instructions preceding the actual inventory advised the S that each item consisted of alternative statements that reflect differing attitudes or opinions toward general social events. For each item, the Ss were requested to indicate which statement seemed to be most reflective of their own personal opinion. The respondents were assured that the entire questionnaire was strictly a measure of personal belief, and that there were therefore no "right" or "wrong" answers.

3. The Measurement of Risk-Taking Preference (p_m)

The instrument employed to assess a person's risk-taking level consisted of the six previously described Kogan-Wallach-Nadien situations -- three skill-determined and three chance-determined ones.¹ These are reproduced in Appendix E. Each situation consisted in a

¹The main study did not include an examination of responses to ambiguous situations because, as noted previously, the pilot-test responses indicated that none of the Kogan-Wallach-Nadien situations had been perceived as ambiguous by the three subgroups.

dilemma in which the respondent was confronted with a choice between, on the one hand, a low-cost low-gain conservative and nonrisky alternative and, on the other hand, a high-cost high-gain risky alternative -- an alternative which, if it culminated in a success, would afford a more desirable outcome than assured by the conservative alternative, but which, if unsuccessful, would lead to a less desirable outcome than that guaranteed by the conservative alternative.

The three chance situations consisted of revised versions of Kogan and Wallach's second, third and fifth dilemmas and the three skill-determined situations consisted of radically altered variations of Kogan and Wallach's fourth, sixth and eleventh dilemmas.

The order of presentation of skill-determined and chance-determined situations was as follows: skill situation no. 6; chance situation no. 2; chance situation no. 3; skill situation no. 4; chance situation no. 5; skill situation no. 11.

4. A Measurement of the Positive or Negative Valuing of Three Possible Outcomes (U_s , U_f , U_c) in Each Risk-Taking Situation

In this instrument (see Appendix E), which was presented along with the description of the six situations, respondents were requested to indicate, along three separate 11-point scales provided for each situation, their assessment of the value for themselves of a success in the risky alternative, which constituted the measure of the utility of a success in the risky alternative (U_s); the negative value of a failure in the risky alternative, which formed the basis for the measure of the negative utility of a failure in the risky alternative (U_f); and the value of the conservative alternative, which provided a measure of the utility of the conservative alterna-

tive (U_c).

The instructions preceding this set of 36 eleven-point scales (three scales per situation) included the caution that the S respond strictly in terms of how he, the respondent, felt about these potential outcomes and to disregard the issue of how others might value or disvalue outcomes.

This assessment of a respondent's three utilities (U_s , U_f , U_c) provided the basis for arriving at each S's utilities' ratio,

$$\hat{p} = \frac{U_c - U_f}{U_s - U_f}$$

5. The Measurement of Subjective Expectancy of Success (p_s).

In this instrument, which is reproduced in Appendix E, the respondent was requested to indicate along 11-point scales, one scale per situation, his own personal expectation of success in obtaining the more desirable outcome in the risky alternative.

This instrument was presented along with the description of the six situations.

Procedure

Prior to administration of the various instruments, all Ss were told that the experiment was concerned solely with attitudes and with decision-making. They were assured that anonymity would be guaranteed by each S indicating in the appropriate spaces provided on each questionnaire his choice of four identification numbers or two false names.

Ss were also assured that the study was totally unrelated to intelligence and that there was no such thing as a correct or incorrect response inasmuch as all answers would be a reflection of

personal attitudes or beliefs.

The Ss were also told that their participation in this experiment would serve a twofold purpose: it would aid the experimenter in gaining data for her doctoral dissertation; and it would provide them, in the course of a poststudy de-briefing session, with insights into major factors that influence decision-making.

The procedure involved administration of five instruments and the order of presentation for Ss differed in only one respect. Half of the Ss received the subjective expectancy of success questionnaire before receiving the valued outcomes instrument, whereas the other half of the Ss received the subjective expectancy questionnaire after having responded to the valued outcomes instrument. The general order of presentation was therefore as follows:

1. Administration of the Demographic Questionnaire.
2. Administration of the 23-item Rotter I-E Scale.
3. After a brief interval of rest following completion of the Rotter I-E Scale, administration of the measurement of risk taking (p_m). The six situations were contained in one booklet and the risk-taking responses were recorded in a separate booklet entitled, "Answers to Risk Taking Questionnaire."
4. Half of the Ss responded to the Subjective Expectancy of Success (p_s) questionnaire while the other half responded to the Valuing of Outcomes Instrument.
5. Finally, those Ss who had already responded to the Subjective Expectancy questionnaire responded to the Utilities instrument whereas those who had completed the Utilities questionnaire gave responses to the Subjective Expectancy measure.

Ss were requested, at the end of their last questionnaire, to indicate any personal reactions (thoughts and/or feelings) that they might have had concerning the experiment.

All Ss were administered the five questionnaires during a single two-hour session. A short time-interval intervened between administration of the Rotter I-E Scale and the Risk-Taking Questionnaire, but all the remaining questionnaires were completed at the S's own pace.

A given S received only one questionnaire at a time. Each S was required to return a completed questionnaire before receiving the next one. However, since responses to the Risk-Taking Questionnaire were recorded in a separate answer booklet and then returned to the experimenter before receiving the next instrument, Ss were permitted to retain the Risk-Taking Situations in case they needed to refer to the dilemmas in responding to the utilities' or subjective expectancies' measures.

When all Ss had responded to and returned all booklets, approximately twenty to thirty minutes was devoted to a debriefing session and to responses to questions that the Ss raised. The debriefing statement, entitled "Purpose of this Study in Risk Taking" is contained in Appendix F.

CHAPTER IV

RESULTS

Prior to examining responses of the entire sample and of the subgroups in skill and chance situations on all dependent measures (see Table 1, p.64), the data for each dependent variable (p_m , p_s , U_s , U_f , U_c , and $\hat{p}$) were screened by means of six separate analyses of variance for the three skill-determined situations and six separate analyses of variance for the three chance-determined situations. Results of these analyses are reported in Appendix G.¹ With the exception of responses by the three subgroups (ICs, Ambis and ECs) to the utilities' ratio ($\hat{p}$) in chance situations, there was little variation as a function of locus of control. On the other hand, with but two exceptions -- the negative utility of failure (U_f) in skill situations and risk taking (p_m) in chance situations -- the twelve analyses of variance revealed exceptionally high variability in the Ss' responses to the separate skill and chance situations.

In the hope of reducing this variability and of thereby permitting subgroup differences to emerge, the remainder of the data analyses were based on summed scores on the three skill-determined situations and summed scores on the three chance-determined dilemmas. The rationale for examining responses to combined skill and combined chance situations derived from the pilot study findings, which had indicated that all Ss, regardless of locus of control, had perceived

¹The form of each anova used in this study was that of a mixed-model two-factor design with repeated measures on one factor (J.B. Winer, Statistical Principles in Experimental Design, p. 303).

all three skill situations as primarily skill-determined and all three chance situations as predominantly chance-determined. On these grounds, the three skill-determined situations were treated as three replicates of a single exemplar of a skill-determined situation and the three chance-determined situations were considered as three replicates of a single exemplar of a chance-determined situation.

I. Levels of Various Response Measures as a Function of Locus of Control and Situational Differences

Although this study's main focus of interest was upon decision-making processes, actual levels of risk taking (p_m), subjective expectancy of success (p_s) and the valuing of differing utilities (U_s, U_f, U_c), as well as of the utilities ratio ($\hat{p}$), were also expected to differ to some degree as a function of locus of control and of the nature of the situation.

As indicated in Appendix H, six multivariate analyses examined the main and interactive effects of situational type (skill versus chance situations) and locus of control variations (being internally or externally controlled) upon six different response measures ($p_m, p_s, U_s, U_f, U_c, \hat{p}$). The influence of locus of control was reflected only in a significant difference among three groups with respect to the ratio of three utilities, $\hat{p}$ ($F = 5.74, p < .01$). However, situational differences elicited significantly marked differences across all groups on five of the six variables: risk taking, p_m , was significant beyond the .001 level ($F = 61.25$); subjective expectancy of success, p_s , beyond the .005 level ($F = 60.29$); the negative utility of failure, U_f , beyond the .005 level ($F = 9.168$); the utility of the conservative alternative, U_s , beyond the .001 level

($F = 29.09$).

Although five of the six multivariate analyses concerned with the main effects of locus of control did not yield significant differences, two-tailed t -tests of differences between ICs and ECs were undertaken because a priori predictions had been made relative to expected differences among Ss as a function of locus of control as well as of situational differences.

Table 1 presents means and standard deviations for six dependent variables -- p_m , p_s , U_s , U_f , U_c , and $\hat{p}$ -- for each of three groups (ICs, Ambis, and ECs) and for all Ss in skill-determined and in chance-determined situations. T -tests comparing the responses of ICs and ECs indicated a complete absence of significance in skill situations and only a significantly lower utilities' ratio ($\hat{p}$) by ECs in chance situations. The latter finding may have resulted from the ECs' lesser valuing of the utility of the conservative alternative (U_c) in chance situations than was the case for ICs. While ICs in skill situations exhibited a higher p_s than did ECs, the expectation of a significantly higher p_s by ICs did not obtain.

Partial support for hypothesis 2 was afforded by virtue of finding that it was with respect to differential responses to the situations themselves (to skill versus chance ones) that all three groups and the entire sample of 90 Ss exhibited significant differences in their responses on most of the dependent variables. Two-tailed correlated t -tests indicated significantly lower risk-taking levels in chance as opposed to skill situations, as evidenced by a significantly higher p_m in chance situations by ICs ($t = 3.83$, $df = 29$, $p < .01$); by Ambis ($t = 4.52$, $df = 29$, $p < .01$); by ECs ($t = 5.48$, $df = 29$, $p < .01$) and by all 90 Ss ($t = 4.57$, $df = 89$,

Table 1
Risk Taking and Related Dependent Measures
for Skill- and Chance-Determined Situations
for Three Subgroups and the Total Sample

		<u>Skill</u>		<u>Chance</u>	
		<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
ICs (n=30)	p _m	18.07	5.68	22.59	6.34
	p _s	25.57	4.54	21.70	6.40
	U _s	27.77	5.35	21.80	5.58
	U _f	22.20	6.01	22.47	8.07
	U _c	16.70	7.42	22.20	6.24
	p	0.78	0.18	0.88	0.11
Ambis (n=30)	p _m	18.73	3.77	23.87	5.09
	p _s	24.60	3.85	18.93	5.24
	U _s	27.70	3.82	26.73	5.09
	U _f	19.43	5.78	24.50	7.43
	U _c	19.27	4.52	22.97	4.13
	p	0.83	0.13	0.93	0.14
ECs (n=30)	p _m	16.00	5.41	21.70	4.82
	p _s	23.80	4.70	20.10	5.14
	U _s	29.80	3.56	24.47	4.18
	U _f	21.40	5.58	22.87	9.12
	U _c	17.67	6.33	20.17	5.87
	p	0.76	0.13	0.81	0.09
All Ss (n=90)	p _m	17.60	5.13	22.72	5.47
	p _s	24.67	4.39	20.24	5.68
	U _s	24.82	4.38	28.10	5.23
	U _f	21.01	5.85	23.28	8.19
	U _c	17.88	6.23	21.78	5.56
	p	0.79	0.15	0.88	0.12

$p < .01$). Two-tailed correlated t-tests suggested a significantly lower subjective expectancy of success in chance as opposed to skill situations by ICs ($t = 3.98$, $df = 29$, $p < .01$); by Ambis ($t = 6.59$, $df = 29$, $p < .01$); by ECs ($t = 3.34$, $df = 29$, $p < .01$) and by the entire group ($t = 4.48$, $df = 89$, $p < .01$).

When considering differential utilities' responses in skill and chance situations, only ECs exhibited a significantly decreased valuing of the utility of a success in the risky alternative (U_s) in chance as opposed to skill situations ($t = 3.22$, $df = 29$, two-tailed, $p < .01$); and only Ambis evidenced a significantly increased valuing of the negative utility of failure (U_f) in chance as opposed to skill situations ($t = 4.92$, $df = 29$, two-tailed, $p < .01$). However, all groups evidenced a significantly increased positive valuing of the utility of the conservative alternative (U_c) in chance as opposed to skill situations. Indications of these significant differences is reflected in two-tailed correlated t-tests by ICs ($t = 3.35$, $df = 29$, $p < .01$); by Ambis ($t = 3.89$, $df = 29$, $p < .01$); by ECs ($t = 2.19$, $df = 29$, $p < .05$) and by all 90 Ss ($t = 3.57$, $df = 89$, $p < .01$).

A significantly higher $\hat{p}$ was evidenced in two-tailed correlated t-tests by all groups in chance as opposed to skill situations: for ICs, $t = 2.65$, ($df = 29$, $p < .05$); for Ambis, $t = 3.53$ ($df = 29$, $p < .01$); for ECs, $t = 2.41$ ($df = 29$, $p < .05$); for all Ss, $t = 2.86$ ($df = 89$, $p < .01$). These substantially higher $\hat{p}$'s in chance situations probably stem largely from the significantly increased valuing of U_c , especially for ICs, who exhibited no significant differences between skill and chance situations in either of the

other two component utilities, U_s and U_f , which comprise, together with U_c , the utilities' ratio, $\hat{p}$.

These findings suggest that, strictly in terms of levels of responding, all Ss differentiated between skill and chance situations (a situational factor) but not as a consequence of locus-of-control variations, with the exception of responses to U_s and U_f .

II. Dissimilarities in Decision-Making Processes in Skill and Chance Situations as a Function of Both Locus of Control and of Situational Differences

Table 2, which presents correlates of risk taking in skill- and chance-determined situations, shows that in skill situations the only significant determinants of p_m were U_c and $\hat{p}$ -- but this was the case only for ECs and for the group taken as a whole (for all 90 Ss). While the ECs' $p_m - U_c$ and $p_m - \hat{p}$ correlations were both significant ($p < .01$), only the ECs' significant $p_m - U_c$ correlations differed substantially from the nonsignificant $p_m - U_c$ correlation evidenced by ICs ($z = 2.41$, $df = 28$, $p < .05$, two-tailed).

The finding of a significant $p_m - \hat{p}$ correlation only among ECs indicates partial support and partial nonsupport for the predictions contained in hypotheses 1 and 2. On the one hand, the discovery that risk-taking can be determined by utilities solely for ECs and not for ICs affords support for the general prediction in hypothesis 1 that individual differences in locus of control would account for the differential applicability of the Burnstein-Vinokur equation. On the other hand, the fact that the Burnstein-Vinokur model predicted the risk-taking of ECs rather than of ICs runs counter to the

Table 2

Correlations with Risk Taking (p_m) of Five Dependent Variables in Skill-Determined and Chance-Determined Situations for Three Subgroups and the Total Sample

		ICs (n=30)	Ambis (n=30)	ECs (n=30)	All the Ss (n=90)
SKILL	p_s	.071	.057	-.225	-.095
	U_s	-.019	-.207	.005	.086
	U_f	.047	-.029	.001	.002
	U_c	.150	.183	.699**	.356***
	$\hat{p}$	.155	.250	.516**	.351***
CHANCE	p_s	.050	.004	.113	-.021
	U_s	.522** ¹	.242	.325* ¹	.333*** ¹
	U_f	.209	.101	.153	.169
	U_c	.539**	.424*	.583**	.534***
	$\hat{p}$	.199	.115	.511**	.278***

¹ Only negative $p_m - U_s$ correlations would have been meaningful. The positive $p_m - U_s$ correlation implies "irrationality" as it indicates the lower utility of a success in the risky alternative, the greater would be the risk taking.

* $p < .05$, $df = 28$, 2-tailed

** $p < .01$, $df = 28$, 2-tailed

*** $p < .01$, $df = 88$, 2-tailed

specific predictions in hypotheses 1 and 2 that the Burnstein-Vinokur "rationality" model would explain only the risk-taking of persons who normally exhibit "rational behavior" -- of ICs in skill-determined situations.

Two responses elicited by chance-determined situations were dramatically different from those evoked by skill situations. Significant $p_m - U_c$ correlations were found among all groups, not just among ECs; and significant $p_m - U_s$ and $p_m - U_c$ correlations characterized the behavior of both ICs and ECs (although the positive $p_m - U_s$ correlations actually indicated a significant absence of relationship in that U_s would be a determinant of p_m only if the relationship were inverse).

That these significant $p_m - U_c$ and $p_m - U_s$ correlations characterized both ICs' and ECs' responses in chance situations provides some support for the general prediction that chance-determined situations would elicit similar behavior among ICs and ECs because of the expectation that locus-of-control variations would be relatively inoperative in chance-determined situations -- situations which possess objective indications that outcomes are controlled solely by external factors and, hence, situations which were expected to elicit perceptions of personal noncontrol over outcomes among ICs as well as among ECs.

In considering decision-making processes (correlates of p_m), both locus-of-control and situational variables appear to have played a role. Situational differences produced differing p_m relationships among ICs but not among ECs; and locus-of-control differences were reflected within each type of situation, with skill situations having elicited significant $p_m - U_c$ and $p_m - \hat{p}$

correlations only among ECs and not among ICs, and with chance situations having elicited significant $p_m - U_c$ and $p_m - \hat{p}$ correlations for ECs but only a significant $p_m - U_c$ correlation for ICs. Thus, the general prediction embodied in hypothesis 2 -- that risk preference would vary both as a function of personality and situational factors -- won some support, whereas the specific prediction -- that utilities would determine risk-taking only for ICs in skill situations -- did not.

III Relationships between Subjective Expectancy of Success (p_s) With Risk-Taking Preferences (p_m), the Utilities' Ratio ($\hat{p}$), and Separate Utilities (U_s, U_f, U_c)

Two specific predictions had been made with respect to the role of subjective expectancy of success (p_s) as a direct or an indirect determinant of risk-taking (p_m). (1) Where risk-taking conformed to the Burnstein-Vinokur model by virtue of being predictable from the utilities' ratio ($p_m \simeq \hat{p}$), p_s had been expected to be equal to or greater than p_m and/or to be correlated with utilities as a consequence of significant $p_s - U_s$, $p_s - U_f$, or $p_s - U_c$ correlations. However, for those ss for whom the Burnstein-Vinokur model did apply -- for ECs in skill and chance situations -- p_s was not invariably equal to or greater than p_m , and p_s was unrelated to separate or combined utilities. (2) Where risk-taking did not conform to the Burnstein-Vinokur model, decision-making was expected to be determined by p_s and/or one or more of the separate utilities. However, for those persons for whom the Burnstein-Vinokur model did not apply -- for ICs in skill and in chance situations -- regression analysis (simple and multiple) revealed that p_s failed to act

singly or conjointly with one or more of the utilities to predict risk-taking.

As noted in Table 3, only in one circumstance did p_s correlate with Ss' behavior. Among ICs in skill situations, significant $p_s - U_s$ and $p_s - \hat{p}$ correlations indicated a relationship between subjective expectancy and utilities; however, the implications for risk-taking of these expectancy-utility relationships is unclear inasmuch as the risk preferences of ICs in skill situations were unrelated either to subjective expectancy or to utilities.

In view of these findings, this study was unable to establish the hypothesis that p_s might have some direct or indirect relationship to a person's risk preference in Kogan-Wallach-Nadlen situations.

IV Contrasts between Subgroups and Total Sample on Risk-Taking Processes

There are three important findings yielded by comparisons of subgroup responses with those of the sample taken as a whole: (1) while the Burnstein-Vinokur prediction of $p_m - \hat{p}$ characterized all Ss taken as a single group, the trichotomization of Ss on the basis of locus-of-control variations revealed that ECs alone were responsible for the significant $p_m - \hat{p}$ correlation in both skill and chance situations (see Table 2). This finding provides some support for hypothesis 1, which had predicted that the limited applicability of the Burnstein-Vinokur model might be attributable to variations in locus of control. However, the fact that the Burnstein-Vinokur model predicted the risk-taking of ECs in both skill and chance situations disconfirmed the specific prediction that a purportedly "rational" model of risk-taking should only explain the behavior of "rational"

Table 3

Correlations with Subjective Expectancy of Success (p_s) of
Four Dependent Variables in Skill- and Chance-Determined
Situations for Three Subgroups and the Total Sample

		ICs (n=30)	Ambis (n=30)	ECs (n=30)	All the $\underline{Ss}^1$ (n=90)
SKILL	p_m	.071	.057	-.225	-.095
	U_s	.474***	-.367	-.360	.358***
	U_f	.138	.035	.132	.112
	U_c	-.112	.113	-.100	-.115
	$\hat{p}$	-.390*	-.285	-.189	-.279***
CHANCE	p_m	.056	.004	.113	-.021
	U_s	.322	.028	.231	.215*
	U_f	.213	.084	-.171	.024
	U_c	.255	-.179	.103	.090
	$\hat{p}$	.004	.180	.141	-.123

*p $\angle$.05, 2-tailed

**p $\angle$.025, 2-tailed

***p $\angle$.01, 2-tailed

¹df = 88 for all 90 $\underline{Ss}$ as opposed to df = 28 for each of the three groups

persons in situations permitting "rational" behavior (i.e., of ICs in skill situations only).

(2) The fact that both $p_m - U_c$ and $p_m - \hat{p}$ correlations characterized the responses of ECs in both skill and chance situations but that only $p_m - U_c$ correlations marked the responses of ICs in chance situations provides empirical support for hypothesis 2, which had predicted that decision-making in Kogan-Wallach-Nadlen situations would be influenced not only by locus-of-control variations, but by the combined influence of locus-of-control and of situational differences.

(3) While the utilities ratio ($\hat{p}$) was a predictor of ECs' risk preference in both skill and chance situations, a single utility, U_c , exceeded $\hat{p}$ as a meaningful predictor of the risk-taking of ECs in both skill and chance situations; and U_c alone (and not $\hat{p}$) provided a predictor of the risk-taking of ICs in chance situations. This finding affords some support for hypothesis 3, which had predicted that some single utility and/or subjective expectancy might afford a better predictor of risk-taking than $\hat{p}$. On the other hand, the theoretical position underlying both hypotheses 1 and 3 was largely disconfirmed by the fact that p_s was not related, either directly or indirectly, to the risk-taking of any group in any situation, and that no predictor was found for the risk-taking of ICs in skill situations.

Chapter V

DISCUSSION

Because the Kogan-Wallach-Nadien situations are different from the Kogan-Wallach dilemmas used by Burnstein and Vinokur, this investigation does not constitute a direct replication of the Burnstein-Vinokur ones. However, since the changes introduced into the Kogan-Wallach-Nadien dilemmas were not ones that should have affected the applicability of the basic model used by Burnstein and Vinokur, this author views this study as a systematic replication of the Burnstein-Vinokur ones and believes that findings in this study should be comparable to those yielded by the Burnstein-Vinokur ones.

I. The Differential Applicability of the Burnstein-Vinokur Model

To date, the Burnstein-Vinokur rationality equation has been the only model employed to investigate risk-taking processes in Kogan-Wallach real-life decision-making situations. Because that model had enjoyed only partial success in predicting risk-taking levels, one broad purpose of this study had been to isolate the particular cases in which the Burnstein-Vinokur model would apply and to introduce an alternative approach to explain the risk-taking of those SS for whom the Burnstein-Vinokur model would not apply. Because the research literature provided evidence of differences among ICs and ECs in terms of their decision-making behavior in

various risky and nonrisky experimental situations, a specific aim of this study was to demonstrate that varied perceptions of personal control over outcomes which are linked to differences in locus of control might be responsible for differing processes underlying risk-taking in Kogan-Wallach-Nadlen situations.

The data derived from this study supports the general contention that the Burnstein-Vinokur equation fails to constitute a universally valid predictor of risk-taking processes. By comparing the responses of the entire sample of Ss with the responses of Ss trichotomized on the basis of locus of control, it was discovered that ECs alone were responsible for the Burnstein-Vinokur prediction of risk preference determined strictly by one's utilities' ratio (by $p_m \simeq \hat{p}$). More specifically, the utilities' ratio provided a modest predictor of the risk preferences for the sample taken as a whole by virtue of accounting for 12 per cent of the variance in skill situations and 8 per cent in chance ones; but an examination of subgroup responses revealed that this prediction which held for the entire sample was attributable solely to the decision-making processes of ECs, for whom $\hat{p}$ explained 27 per cent of the variance in skill situations and 26 per cent in chance ones.

While this major objective was achieved, the specific prediction was not. Because of its description as a model of rational risk-taking, the Burnstein-Vinokur equation had been expected to be most applicable to persons who perceived the possibility for personal control and hence for rational behavior -- i.e., it was expected to apply to ICs confronted with skill situations. However, this did not occur. Instead it explained only the risk preferences of ECs, of persons whose behavior normally reflects a perception of nonpersonal

control in both skill and chance situations.

A second interesting discovery not only disproves the capacity of the Burnstein-Vinokur model to predict the risk-taking for all Ss but also calls into question the validity of the model itself. The model was asserted by its authors to predict risk preference in Kogan-Wallach situations for those persons for whom $U_s > U_c > U_f$ and for whom $p_s \cong p_m$. Yet a separate analysis of the data revealed that for those ICs who met these criteria, the Burnstein-Vinokur model did not serve as a predictor of risk-taking, either in skill or in chance situations. On the other hand, the analysis indicated that for ECs who violated these criteria, the Burnstein-Vinokur model still served as a predictor of their risk-taking. Thus, the predictive ability of the Burnstein-Vinokur equation itself is called into question on two counts: in this study it failed to predict the risk-taking of Ss whose responses conformed to its prerequisite criteria; and yet, at the same time, it successfully predicted the risk-taking of Ss who had violated its prerequisite criteria.

II Risky Decisions as a Joint Function of Personality and Situational Factors

A second general objective of this study was to show that decision-making processes vary both as a function of locus of control and of situational differences; for situational as well as locus of control factors were expected to bear upon a person's perception of the presence or absence of purely personal control over outcomes -- and hence upon the factors determining their risk preferences. Because the bulk of the research data had suggested that ECs' behavior is externally controlled in both skill and chance situation (i.e.,

by implication, that ECs fail to perceive that they, personally, can control outcomes either in skill or in chance situations), it had been expected that ECs would exhibit similar decision-making processes in both skill and chance situations. On the other hand, because research findings had indicated that the behavior of ICs reflects a perception of personal control over outcomes in skill situations but a perception of nonpersonal control over outcomes in chance ones, it had been expected that the decision-making processes of ICs would vary as a function of the type of situation. These differing general expectations for ICs and ECs in skill and chance situations were borne out by the data: ECs' decision-making was predictable both from their utilities' ratio and a single utility (U_c) in both skill and chance situations whereas ICs' risk preferences were not clearly predictable from any variable in the skill situations, but were predictable from U_c in chance situations. Thus the contention that risky decision-making would be influenced both by personality and situational factors was supported by the data.

III An Alternative Decision-Making Model

A third general aim had been to demonstrate that some single utility and/or subjective expectancy of success would afford a better predictor of success than would the utilities' ratio alone. This general objective also won some empirical support inasmuch as a single utility, U_c , emerged as the only meaningful predictor of ICs' risk-taking in both skill and in chance situations.

IV The Burnstein-Vinokur Model: A Measure of Rational or Nonrational Risk-Taking?

While some broad objectives of this study gained empirical support, some specific predictions did not. The Burnstein-Vinokur model, which had been expected to explain the risk-taking only of ICs in skill situations, actually emerged as a predictor (albeit a modest one) for ECs in both skill and chance situations. Thus, while support was gained for the general prediction that the " $p_m \simeq \hat{p}$ " equation would vary as a function of locus-of-control differences, the specific expectations were controverted by the data.

Why is it that these specific outcomes were not foreseen and predicted? Well, underlying the specific predictions of the differential applicability of the Burnstein-Vinokur model was the following logic: as the Burnstein-Vinokur equation had been adduced by its authors as a model of "rational" risk taking, and as empirical findings in locus-of-control studies had indicated that only ICs in skill situations would be rational, the Burnstein-Vinokur rationality model was expected to be most applicable to the risk taking of rational persons confronted with situations permitting rational behaviors -- i.e., to the risk taking of ICs in skill situations.

In order to discover why the specific predictions were disconfirmed, let me review the evidence and reasoning that underlay the above-cited assumptions. As noted previously, rational risk taking had been traditionally viewed as resulting from choices designed to maximize subjective expected utility; and such rational choices have been associated with behaviors marked by acquisition

and utilization of information, consistent and nonrandom choices, and evaluations of the subjective expectancy and the utility associated with each alternative (Edwards, 1961, 1965). Empirical data derived from locus-of-control studies had suggested that rational behavior would be feasible only in skill situations (i.e., in situations permitting a perception of some degree of personal control over outcomes); and empirical findings indicated that only ICs in skill situations exhibited behaviors reflective of a perception of personal control. On these grounds, the Burnstein-Vinokur "rationality" model had been expected to predict the "rational" decision making of ICs in skill situations.

What significance can be attached to the finding that the Burnstein-Vinokur equation provided only a modest predictor of the risk taking of ECs, of persons whose behavior has usually been interpreted as nonrational? Does it not suggest that the Burnstein-Vinokur equation may have been mislabeled as a "rationality" model? The exploratory study indicated that, in Burnstein and Vinokur's own investigations, their equation was only explaining the risk taking of Ss confronted with chance-determined or ambiguous situations, i.e., of Ss assessing situations that normally induce a perception of nonpersonal control over outcomes; and in this study the equation also predicted only the risk taking of persons who normally perceive nonpersonal control over outcomes (ECs in skill and in chance situations). Thus, if nonrational behavior is associated with a perception of nonpersonal control over outcomes, and if the Burnstein-Vinokur model can only predict the behavior of persons who normally exhibit "nonrational behavior," it would appear that the Burnstein-Vinokur model is one that is descriptive only of "nonrational" risk taking.

V. IC's Risk Taking in Skill-Determined Situations

The data supported the general expectation the the decision-making processes of the ECs would be essentially the same in both skill and chance situations, but that the decision-making processes of ICs would be different. However, one startling and not readily explainable finding emerged: while ICs' responses to skill and chance situations were significantly different, no single factor (or combination of factors) explained ICs' risk taking in skill-determined situations. Did the ICs, persons who normally exhibit rational responses in skill situations, behave nonrationally -- even irrationally -- because they, too, failed to perceive the clear possibility for personal control over outcomes in the skill situations? Yet, the ICs' responses to skill situations were clearly different from those of ECs, and were clearly different from their own responses to chance situations.

Let us propose a tentative post-hoc explanation. A pilot study had indicated that all Ss (ICs, Ambis and ECs) had perceived each of the skill-determined situations as permitting greater control by personal ability and effort than by chance or external factors. The mean amount of personal control perceived by ICs for the three skill situations was 7.1, 8.6, 8.5 (these mean scores represented the perception by ICs of a greater amount of personal control than was perceived by Ambis and ECs). By contrast, the mean amount of personal control perceived by ICs in chance situations was 1.6, 2.4, and 4.7. In general, the mean responses of all Ss to the combined skill situations was significantly greater than the mean responses to the combined chance situations, thereby indicating

that a significantly greater amount of personal control was perceived to inhere in the skill situations. Although these differing perceptions of the skill and chance situations were not expected to yield differing responses among ECs -- and such proved the case -- they were expected to yield differences among ICs. However, while ICs did exhibit significantly different responses, the specific factors responsible for the ICs' risk taking in skill situations were not isolated. Could it be, then, that the ICs perceived the skill situations as ones affording "only some degree of personal control greater than 55 per cent?" (55 represented the arbitrary cut-off point between skill-determined and ambiguous situations, as is noted in the Method Section). Could it be that the amount of perceived personal control was not sufficiently great in the minds of ICs to give them strong convictions about their ability to control outcomes?

In other words, the ICs may have perceived the skill situations as affording "some control" but "not sufficient control." Hence, the issue of "degree of control" may have been a factor. If a perception of "insufficient control" induced feelings both of uncertainty and of some personal control, it would explain why the ICs' p_s was only somewhat higher, rather than significantly higher, than that of ECs. Furthermore, given the foregoing inference, the perception of "some degree of personal control" may have permitted the emergence among ICs of the predicted significant relationships between utilities and subjective expectancies; but the perception of "an insufficient degree of personal control" may have interfered with a rational choice -- with the choice of a risk preference that

would have clearly reflected a significant relationship between risk taking on the one hand, and of subjective expectancy and utility on the other. The absence of such clear-cut relationships, then, may have stemmed from a sense of "uncertainty" as to how much the ICs could expect to succeed, with such uncertainty emerging as apparently non-rational behavior.

The possibility of nonrationality as induced by "uncertainty over amount of personal control" is also suggested by the written comments of some ICs in their questionnaires and by Ss' post-test debriefing session expressions of dissatisfaction stemming from the lack of sufficient information regarding skill situations 1 and 3. Inasmuch as the locus-of-control literature indicates that ICs actively seek out and utilize information in skill-determined situations, it is conceivable that some ICs' discomfiture over inadequate possession of information may have been responsible for uncertain and nonrational responses.

VI The Role of Subjective Expectancy of Success

A third unanticipated finding was the discovery that subjective expectancy of success (p_s) failed to emerge either as a direct or and indirect determinant of risk taking in situations perceived as lacking opportunities for personal control over outcomes. A possible explanation may inhere in the nature of the original Kogan-Wallach situations and the revised Kogan-Wallach-Nadien ones. All of these situations represent ones that are "unique" -- unique in the sense that respondents cannot derive an estimate of their own subjective likelihood of success either from identical past experiences or from a sequential task in which they could perhaps learn how successful

or unsuccessful they would be in future attempts in the risky course of action. If sure knowledge as to one's own expectancy of success is unavailable, perhaps one's decision-making is necessarily determined solely by the known utility of each potential outcome on the one hand, and only by "guessing" about one's subjective expectancy of success on the other hand; and if "guessing" were indeed the basis for the Ss' responses to the subjective-expectancy questionnaire, it could explain why p_s did not emerge as a determinant of the Ss' risk preferences. For "guessing" is usually associated with a lack of conviction; and a lack of conviction, with indecisiveness. In sum, the effect of the "unique" nature of the situations used in this study as well as in the Burnstein and Vinokur ones may have resulted from the following condition: if rational decision-making is dependent upon relatively certain knowledge of one's subjective expectancy of success as well as of one's utilities, then "rational" risk taking in the Kogan-Wallach and in the Kogan-Wallach-Nadien situations may be impossible because these situations permit relatively sure knowledge only of one's utilities, and not of one's expectancies.

VII Implications and Suggestions

The data yielded by this study seem to justify the assertion that the Ss were presented with two clearly distinguishable types of situations; for (1) skill and chance situations elicited from all Ss significantly differing levels of risk taking and subjective expectancy of success, and utilities; and (2) skill and chance situations elicited from ICs correlates of risk taking in chance situations but not in skill ones. The nonemergence of specific identifiable correlates of ICs' risk taking in skill situations

suggests that a crucial element in such situations may have been lacking; i.e., the degree of perceived personal control over outcomes may have been insufficient.

Whether or not this assertion is valid, the findings yielded by this study suggest two interrelated issues of major concern: (1) the absence of clear predictors of rational risk taking suggests that there does not yet exist a proper model to describe risky decision-making in situations perceived as permitting personal control over outcomes; and (2) as presently devised, the Kogan-Wallach-Nadlen dilemmas fail to provide a set of situations that permit the operation of rational behavior. Consequently, before discarding the view that subjective expectancy of success plays no identifiable role in risky decision-making in Kogan-Wallach-Nadlen real-life hypothetical situations, it is necessary to create new skill-determined situations that will induce a greater perception of personal control and, thereby, provide an instrument which can be used to determine whether situations permitting a greater perception of personal control over outcomes will elicit "rational" behavior among ICs in terms of relationships between risk preference on the one hand, and utilities and expectancies on the other. For it seems reasonable to expect that increased objective indications of personal control over outcomes in skill situations should decrease the uncertainty of ICs in assessing such situations; and such decreased uncertainty might well be reflected in rational behavior by virtue of the ICs' increased ability to assess both their subjective expectancy of success and utilities, and hence, their ability to arrive at decisions based on a consideration of both these factors.

Naturally, in order to establish whether there really is a co-relationship between "amount of personal control over outcomes" and "amount of certainty as to one's subjective expectancies of success," and to further establish whether such increased certainty would really yield an indication of factors determining risk preferences in skill situations, the following steps would have to be taken: (1) situations indicating greater personal control would have to be created and, before administration, would have to be confirmed by outside judges as being ones whose outcomes are perceived as more subject to personal control than was the case for the skill situations used in this experiment; and (2) in a future experiment using such situations, Ss would have to indicate their "degree of confidence or certainty as to their estimation of their own personal expectancy of success."

Given the absence of an appropriate model of rational risk taking in Kogan-Wallach-Nadieu situations, allow me to propose one. If newly created situations could be established as ones affording undeniable indications of a high degree of personal control over outcomes, perhaps such situations would permit rational Ss to evaluate their subjective expectancy of success with certainty, and would enable such Ss to select their risk preferences both in terms of their subjective expectancy of success and of one or more of the three utilities.

Further studies of risk taking in skill- and chance-determined Nadieu-Kogan-Wallach situations might also benefit from comparing two different approaches to the assessment of an S's utilities. In this study, each utility was evaluated separately so that, on a scale of 0 to 10, the utility of success in the risky alternative (U_s) was not affected by the value attached either to the negative

utility of failure (U_f) or by the value attached to the utility of the conservative alternative (U_c). A future study might provide for two methods of assessing utilities: one would be the method utilized in this study; but a second method would require $\underline{S}$ s to arrive at their U_s only after considering both their U_f and U_c . Similarly, $\underline{S}$ s might be requested to indicate their U_c only after assessing the relative subjective value of U_s and U_f .

The reason for suggesting inclusion of this second method of assessing U_s and U_c stems from the realization that, in real-life situations, individual $\underline{S}$ s may differ in their approach to assessing utilities: some $\underline{S}$ s might make separate and orthogonal assessments of each utility whereas other $\underline{S}$ s might assess each utility only in terms of the value of the other two utilities. Thus, given the second approach to utilities' measurement, a clearer reading of the relationship of U_s to p_m and of U_c to p_m might be achieved; and, perhaps, a clearer reading of U_s and U_c might lead to a clearer relationship between these two utilities and subjective expectancy of success -- and hence, between subjective expectancy of success and risk taking.

ABSTRACT

One purpose of this study was to show that the limited applicability of the Burnstein-Vinokur model to predict the risk taking of all Ss in Kogan-Wallach dilemmas was their failure to examine the individual differences in subjective expectancy of success and in perceptions of personal or nonpersonal control over situational outcomes that are associated with differences in locus of control. In order to determine whether subjective expectancy of success was a factor in decision-making under uncertainty, a measure of subjective expectancy of success was introduced.

Because situations differ with respect to clear-cut objective possibilities for controlling outcomes, a second aim was to ascertain whether skill-determined situations -- ones indicating objective possibilities for personal control -- would elicit differing subjective perceptions of personal control as a consequence of locus-of-control differences, with such differences inferred from dissimilar risk-taking processes.

The original Kogan-Wallach situations were revised in several respects: (1) in order to ascertain whether risk-taking differences occurred as a function both of locus of control and of situational differences, clearly nonambiguous skill-determined and chance-determined situations were created; (2) in order to reduce ambiguity associated with the utilities, greater details were afforded concerning the positive and negative utilities associated with the risky and conservative alternatives; (3) in order to lessen the hypothetical nature of the situations, the respondent himself was depicted as the central character of each situation and the dependent risk taking measure represented the respondent's own willingness to take risks

for himself; and (4) in order to render the situations more representative of real-life ones, the risk-taking measure did not require selection of the risky alternative but instead permitted the respondent the option of selecting either the risky or the conservative alternative.

The Ss -- 90 Caucasian male graduate students in guidance and counselling courses at Long Island and Fordham Universities -- were differentiated in terms of locus of control by the Rotter I-E scale and were administered three skill- and three chance-determined situations. Associated with each of the six situations were measures of levels and of correlates of risk taking (p_m), of subjective expectancy of success in the risky alternative (p_s), of the utility of the conservative alternative (U_c) and of the utility of a success (U_s) or a failure (U_f) in the risky alternative.

While subjective expectancy of success did not emerge as a direct determinant of risk taking, it did prove to be a correlate of the utility of a success in the risky alternative for ICs in skill-determined situations.

As predicted, the risk taking of Ss confronted with situations perceived as lacking personal control over outcomes (chance-determined situations) elicited one set of decision-making processes and situations perceived as possessing some degree of personal control (skill-determined situations) elicited different processes; for the risk taking of externally controlled persons (ECs) in both skill and chance situations and of internally controlled persons (ICs) only in chance situations was predicted best by the utility of the conservative alternative (U_c), whereas for ICs in skill situations no single variable predicted their risk taking.

When locus-of-control differences were disregarded and responses of the entire sample were examined, the Burnstein-Vinokur model of risk taking determined by utilities ($p_m \simeq \hat{p}$) won some empirical support. However, the Burnstein-Vinokur model's predictive power proved limited in two respects. Firstly, an examination of ICs and ECs, as separate subgroups, revealed that differences were occurring as a function of locus-of-control variations; for the relationship between p_m and p found among all Ss taken as a group were solely attributable to the responses of ECs. Thus, the Burnstein-Vinokur model predicted the risky decision making only of externally controlled persons. Secondly, the utility of the conservative alternative (U_c) proved to be a better predictor of risk taking than did Burnstein and Vinokur's utilities' ratio (p), not only for ECs in skill and chance situations but also for ICs in chance situations and also for all Ss taken as a group.

The nonemergence of any single variable as a determinant of ICs' risk taking in skill situations may have stemmed from irrational behavior arising from a lack of certainty as to the amount of personal control they possessed over situational outcomes.

Future research might be able to pinpoint the role of subjective expectancy in risk taking if skill-determined situations were to possess stronger objective indications of the possibility for personal control over outcomes; and a greater understanding of the role of specific utilities in relationship both to risk taking and to subjective expectancy might emerge if the measure of utilities required two approaches: one in which utilities were evaluated in relationship to each other, and the other in which utilities would be assessed independently of each other.

APPENDIX A

EXPLORATORY STUDY FINDINGS

Appendix A

Exploratory Study

Mean Scores of Ten Male Judges Indicating the Amount of
Perceived Personal Ability to Control Outcomes
in the Original Kogan-Wallach Situations

Type of Choice Dilemma	Mean Score
Skill-Determined	
No. 6	8.1
Ambiguous	
No. 1	5.3
No. 4	5.3
No. 9	5.2
No. 11	5.0
No. 12	4.7
Chance-Determined	
No. 2	2.5
No. 3	2.4
No. 5	2.6
No. 7	2.4
No. 8	2.4
No. 10	2.3

APPENDIX B

KOGAN-WALLACH DILEMMAS

Appendix B

CHOICE DILEMMAS PROCEDURE

Nathan Kogan and Michael Wallach

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

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

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

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

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

Please check the lowest probability that you would consider acceptable to make it worthwhile for Mr. A to take the new job.

- ☐ The chances are 1 in 10 that the company will prove financially sound.
- ☐ The chances are 3 in 10 that the company will prove financially sound.
- ☐ The chances are 5 in 10 that the company will prove financially sound.
- ☐ The chances are 7 in 10 that the company will prove financially sound.
- ☐ The chances are 9 in 10 that the company will prove financially sound.
- ☐ Place a check here if you think Mr. A should *not* take the new job no matter what the probabilities.

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

256

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

Please check the lowest probability that you would consider acceptable for the operation to be performed.

- ☐ Place a check here if you think Mr. B should *not* have the operation no matter what the probabilities.
- ☐ The chances are 9 in 10 that the operation will be a success.
- ☐ The chances are 7 in 10 that the operation will be a success.
- ☐ The chances are 5 in 10 that the operation will be a success.
- ☐ The chances are 3 in 10 that the operation will be a success.
- ☐ The chances are 1 in 10 that the operation will be a success.

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

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

Please check the lowest probability that you would consider acceptable for Mr. C to invest in Company X Stocks.

- ☐ The chances are 1 in 10 that the stocks will double their value.
- ☐ The chances are 3 in 10 that the stocks will double their value.
- ☐ The chances are 5 in 10 that the stocks will double their value.
- ☐ The chances are 7 in 10 that the stocks will double their value.
- ☐ The chances are 9 in 10 that the stocks will double their value.
- ☐ Place a check here if you think Mr. C should *not* invest in Company X stocks, no matter what the probabilities.

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

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

Please check the lowest probability that you would consider acceptable for the risky play to be attempted.

- Place a check here if you think Mr. D should *not* attempt the risky play no matter what the probabilities.
- The chances are 9 in 10 that the risky play will work.
- The chances are 7 in 10 that the risky play will work.
- The chances are 5 in 10 that the risky play will work.
- The chances are 3 in 10 that the risky play will work.
- The chances are 1 in 10 that the risky play will work.

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

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

Please check the lowest probability that you would consider acceptable for Mr. E's corporation to build a plant in that country.

- The chances are 1 in 10 that the foreign country will remain politically stable.
- The chances are 3 in 10 that the foreign country will remain politically stable.
- The chances are 5 in 10 that the foreign country will remain politically stable.
- The chances are 7 in 10 that the foreign country will remain politically stable.
- The chances are 9 in 10 that the foreign country will remain politically stable.
- Place a check here if you think Mr. E's corporation should *not* build a plant in the foreign country, no matter what the probabilities.

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

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

Please check the lowest probability that you would consider acceptable to make it worthwhile for Mr. F to enroll in University X rather than University Y.

- Place a check here if you think Mr. F should *not* enroll in University X, no matter what the probabilities.
- The chances are 9 in 10 that Mr. F would receive a degree from University X.
- The chances are 7 in 10 that Mr. F would receive a degree from University X.
- The chances are 5 in 10 that Mr. F would receive a degree from University X.
- The chances are 3 in 10 that Mr. F would receive a degree from University X.
- The chances are 1 in 10 that Mr. F would receive a degree from University X.

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

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

Please check the lowest probability that you would consider acceptable for the risky play in question to be attempted.

- The chances are 1 in 10 that the play would succeed.
- The chances are 3 in 10 that the play would succeed.
- The chances are 5 in 10 that the play would succeed.
- The chances are 7 in 10 that the play would succeed.
- The chances are 9 in 10 that the play would succeed.
- Place a check here if you think Mr. G should *not* attempt the risky play, no matter what the probabilities.

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

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

Please check the lowest probability that you would consider acceptable for Mr. H to continue with his musical training.

- Place a check here if you think Mr. H should *not* pursue his musical training, no matter what the probabilities.
- The chances are 9 in 10 that Mr. H would succeed as a concert pianist.
- The chances are 7 in 10 that Mr. H would succeed as a concert pianist.

- The chances are 5 in 10 that Mr. H would succeed as a concert pianist.
- The chances are 3 in 10 that Mr. H would succeed as a concert pianist.
- The chances are 1 in 10 that Mr. H would succeed as a concert pianist.

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

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

Please check the lowest probability that you would consider acceptable for an escape to be attempted.

- The chances are 1 in 10 that the escape would succeed.
- The chances are 3 in 10 that the escape would succeed.
- The chances are 5 in 10 that the escape would succeed.
- The chances are 7 in 10 that the escape would succeed.
- The chances are 9 in 10 that the escape would succeed.
- Place a check here if you think Mr. J should *not* try to escape no matter what the probabilities.

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

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

Please check the lowest probability that you would consider acceptable to make it worthwhile for Mr. K to run for political office.

- Place a check here if you think Mr. K should *not* run for political office no matter what the probabilities.
- The chances are 9 in 10 that Mr. K would win the election.
- The chances are 7 in 10 that Mr. K would win the election.
- The chances are 5 in 10 that Mr. K would win the election.
- The chances are 3 in 10 that Mr. K would win the election.
- The chances are 1 in 10 that Mr. K would win the election.

11. Mr. L, a married 30-year-old research physicist, has been given a five-year

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

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

Please check the lowest probability that you would consider acceptable to make it worthwhile for Mr. L to work on the more difficult long-term problem.

- The chances are 1 in 10 that Mr. L would solve the long-term problem.
- The chances are 3 in 10 that Mr. L would solve the long-term problem.
- The chances are 5 in 10 that Mr. L would solve the long-term problem.
- The chances are 7 in 10 that Mr. L would solve the long-term problem.
- The chances are 9 in 10 that Mr. L would solve the long-term problem.
- Place a check here if you think Mr. L should *not* choose the long-term, difficult problem, no matter what the probabilities.

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

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

Please check the lowest probability that you would consider acceptable for Mr. M and Miss T to get married.

- Place a check here if you think Mr. M and Miss T should *not* marry, no matter what the probabilities.
- The chances are 9 in 10 that the marriage would be happy and successful.
- The chances are 7 in 10 that the marriage would be happy and successful.
- The chances are 5 in 10 that the marriage would be happy and successful.
- The chances are 3 in 10 that the marriage would be happy and successful.
- The chances are 1 in 10 that the marriage would be happy and successful.

APPENDIX C

KOGAN-WALLACH-NADIEN SITUATIONS

Situation 1

You are an electrical engineer. You are married and have one child. Since graduating from college 5 years ago, you have been working in a large electronics corporation where you are assured of a lifetime job with a modest, though adequate, salary as well as liberal pension benefits upon retirement.

The founder and owner of a small newly formed electronics firm offers you a job with his new company as one of the company's two most important members. The new company's owner has had many years of experience in selling electronics and has a reputation in the trade as a skillful, persuasive, and highly successful salesman.

This new company faces competition from large electronics firms, so that its future is uncertain. However, on the basis of careful assessments of estimated markets, the degree of demand for the company's special services, and the company's projected earnings, the owner estimates that his new company will have competitive advantages. For the new company's smallness will permit its personnel to produce quality items and give personalized service.

You and the owner would be the new company's two key members, and your own performance as an electrical engineer would play a crucial role in the quality of the items produced.

Accepting this new job would enable you to earn considerably more money than you are now earning, would give you considerable control over company policy, and would permit an eventual share in the company's ownership -- provided that the company can survive the competition of larger electronics firms. However, if the company should fail, you might find yourself without a job.

In this situation, the conservative alternative represents the decision to remain on in your present job, and the risky alternative represents the decision to accept the new job.

Situation 2

You are a 45 year old accountant. You recently suffered a heart attack. After consulting with several renowned specialists, your general physician informed you that your heart ailment was diagnosed as being so serious that you will have to change many of your strongest life habits: you will have to reduce drastically your work activities, go on a strict diet, and give up most of your favorite leisure-time pursuits.

Your team of heart specialists have indicated, however, that a delicate medical operation could be attempted. If the heart surgery were to prove successful, your heart condition would be completely remedied and you could resume a normal life. However, the success of the operation is NOT assured; in fact, the operation could prove fatal.

In this situation, the conservative alternative represents the decision NOT to have the operation, and the risky alternative represents the decision TO HAVE the operation.

Situation 3

You are a married man with a wife and two children. You have a steady job that pays you about \$9,000 annually. You can afford the basic necessities of life, but few of the luxuries. A distant relative of yours recently died and left you a \$10,000 insurance policy.

You have decided to invest the \$10,000. You are well aware of the secure "blue-chip" stocks and bonds that would pay approximately 7% on your investment. On the other hand, you have heard from a close friend that the stocks of a relatively unknown company, Company X, might double their present value in one year if a new product currently being manufactured is favorably received by the buying public. If, however, the product is unfavorably received, the stocks could decline in value.

In this situation, the conservative alternative represents the decision to invest in secure "blue-chip" stocks and bonds, and the risky alternative represents the decision to invest in Company X stocks.

Situation 4

You are the quarterback of College X's football team. College X is playing its final game of the season with its traditional rival, College Y. During the past season, College X and College Y have won an equal number of games. Consequently, this game will determine which college will win the series.

The game is in its final seconds of play and your team, College X, is behind in the score. College X has time to run just one more play. The rules require that the clock must stop after just one more play, with no continued playoff in case of a tie. As the team's quarterback, you must decide whether it would be best (1) to follow a tactic that would almost certainly result in a tie score with neither team emerging as a victor in the series, or (2) to decide on a more complicated and risky play that could bring victory if it succeeded, but defeat if it failed.

In making your decision, you need not concern yourself about the competency of your teammates or their ability to implement your strategy; for past experience has indicated both the willingness and ability of your teammates to respond positively to your leadership.

In this situation, the conservative alternative represents the decision to follow a tactic that would almost certainly result in a tie score, and the risky alternative represents the decision to attempt the more complicated and risky play.

Situation 5

You are the president of a very prosperous light-metals corporation in the United States. For purposes of business expansion, you are planning to build an additional plant in a new location.

You are considering two choices of a new location for this new plant. You could build a new plant in the United States, where there would be only a moderate return on your initial investment; or you could build a plant in a small foreign country.

There are certain advantages to building the plant in the small foreign country: lower labor costs; easy access to raw materials; and low capital-gains taxes--all of which would yield a higher return on your initial investment than would be the case if you were to build the plant in the U.S. However, there are also certain possible disadvantages to building in the foreign country: the foreign country has a history of political instability and revolutions, and a leader of a minority party there is committed to nationalization--that is, to taking control over all foreign investments.

In this situation, the conservative alternative represents the decision to build your new plant in the U.S., and the risky alternative represents the decision to build your plant in the small foreign country.

Situation 6

You are currently a college senior. You are very eager to pursue an active career as a psychologist and therefore wish to engage in graduate study in psychology leading to the Doctor-of-Psychology degree. You have been accepted by both University X and also by University Y.

University Y's psychology department has a reputation as being quite mediocre and, therefore, the department's graduates do not always have an opportunity for good jobs. However, almost everyone admitted to College Y does receive a degree.

On the other hand, University X has a national reputation for excellence in psychology, and a degree from University X would afford you not only excellent training, but also the promise of eligibility for a wider range of worthwhile jobs in psychology after graduation. While University X's standards are so rigorous that only a certain percentage of candidates actually receive a degree, it has generally been found that students who apply themselves to their studies are among those who do graduate.

In this situation, the conservative alternative represents the decision to enter University Y, and the risky alternative represents the decision to enter University X.

Situation 7

You are a very competent chess player. You are currently participating in the final game of a national chess tournament. Your opponent is last year's champion. As it happens, in this tournament you and your opponent have each won an equal number of games.

During the course of this final game, you note the possibility of a deceptive and risky maneuver. If successful, the risky maneuver would bring you a victory. If the attempted maneuver should fail, however, you would be left in an exposed position and your opponent would be almost certain to win this final game.

In this situation, the conservative alternative represents the decision NOT to make the risky maneuver, and the risky alternative represents the decision TO ATTEMPT the risky maneuver.

Situation 8

You are a college senior with a pre-medical college background, and you have been accepted in a good medical school. However, you have also studied the piano since early childhood and have won national amateur prizes, have given several small piano recitals, and have been adjudged by musical experts as having a high potential as a concert pianist.

You are now confronted with the necessity for choosing between a career in medicine and a career in music. If you were to choose the career of a physician, you would have considerable assurance of a certain amount of prestige and of financial rewards. On the other hand, if you were to enter a conservatory of music for advanced training, you would have no guarantee that, after graduation, you would attain success or renown as a concert pianist because the possibilities for success and renown are less great in the musical field than they are in the medical field.

Your personal commitment to music is deep; and if considerations of financial success and renown were not a factor, your preference would be to pursue a musical career.

In this situation, the conservative alternative represents the decision to go to medical school, and the risky alternative represents the decision to go to the conservatory of music.

Situation 9

You are in the armed services and have been fighting in a war in a foreign country. You were captured by the enemy several months ago and have been in a prisoner-of-war camp ever since. Conditions in the camp are quite bad: you spend long hours at hard physical labor; you are kept at almost starvation level; the barracks to which you are assigned are infested with rats; and you are frequently subjected to periods of interrogation, sometimes accompanied by torture.

You have just discovered that there is a possibility of escaping from the prisoner-of-war camp by concealing yourself in a truck that shuttles in and out of the camp. If you are successful in devising some plan for entering and concealing yourself in the truck without detection, your escape will be assured. However, if your plan should not work, your detection by the enemy could result in your being executed.

In this situation, the conservative alternative represents the decision NOT to attempt to escape, and the risky alternative represents the decision TO MAKE the attempt to escape.

Situation 10

For many years you have been a successful member of the City Council and your various civic activities have won for you a considerable amount of favorable publicity and local fame. You have been approached by leaders of your political party as a possible congressional candidate in the next election. Your party is the minority one in your district, although several of your party's members have won elections in the past.

Failure to win the election might jeopardize your career at the local level as the campaign would expose you to the attacks of your political opponents. On the other hand, success is possible provided that you can, through the use of political polls and analysts, identify and then support those issues that are important to a majority of your constituents. This approach has been identified by political analysts as having contributed to the success of other members of your party who have won past elections in your district.

In this situation, the conservative alternative represents the decision NOT to be a congressional candidate, and the risky alternative represents the decision TO BECOME the congressional candidate.

Situation 11

You are a married, 30 year-old research physicist who has been given a five-year appointment by a major university laboratory. You have a choice of working on one of two types of projects: (1) You could follow the procedure of most of your associates -- that of working on a series of short-term problems of limited scope where solutions are relatively easy to find but where the outcomes would not be labeled as major contributions to your field; (2) On the other hand, you could work on a difficult, long-term problem. If a solution could be found, you would have resolved a basic scientific issue of crucial concern in your field. As a consequence, you could become eligible for a Nobel prize.

Failure to solve the long-term problem would leave you little to show for your five years of work in the laboratory and might make it more difficult for you to get a good job at the end of the five years. However, students of the sociology of science have found that success in achieving scientific breakthroughs is usually dependent upon (a) an exhaustive review of the literature relative to the problem; (b) a careful definition of the problem; and (c) perseverance over a few years in conducting experimental tests of crucial hypotheses.

In this situation, the conservative alternative represents the decision to work on short-term, unimportant problems; and the risky alternative represents the decision to work on the long-term, highly important problem.

Situation 12

You have been dating Miss T for two years, seeing her about twice weekly. Both you and Miss T wish to get married as you are deeply in love. However, you are both concerned about the fact that you have had a number of arguments that indicate sharp differences of opinion in the way each of you views certain matters.

Miss T has been offered a job that will take her out of the country for a period of 5 years. She will accept the job only if you both decide not to marry. Because Miss T must make her decision about the job quite soon, you and Miss T decide to seek professional advice from a marriage counselor as to whether your differences of opinion would impede a happy marriage.

On the basis of these meetings with the marriage counselor, you both come to realize that while a marriage is more apt to endure if both partners agree on basic issues, nevertheless serious disagreements need not threaten the happiness of marriage, especially if both partners attempt to reconcile differences whenever they arise.

In this situation, the conservative alternative represents the decision NOT to marry Miss T, and the risky alternative represents the decision TO MARRY Miss T.

APPENDIX D

PILOT STUDY MATERIALS AND TABLES

Please Respond to the Following General Questions

Sex: Male ____ Female ____

Date of Birth: Day ____ Month ____ Year ____

College that you are currently attending: _____

Division of school that you are attending: Evening Session ____ Day Session ____

Major OR General Field of Interest _____

Instructions

On the following pages, you will find a series of 12 situations that are likely to occur in everyday life. Situations like these, or ones highly similar to them, may confront you, personally, at some time during the course of your life. So, please try to imagine that these situations are real ones and that you are the central character in each one of them.

Each situation involves a dilemma -- a choice between two alternative courses of action. In other words, as the central person in each situation, you are presented with two alternative decisions that you might make: one alternative represents a conservative decision -- a decision that involves little or no risk; the other alternative represents a risky decision -- a decision that does involve some degree of risk.

In this particular study, we are concerned only with your assessment of the RISKY DECISION. Specifically, we would like you to estimate the degree to which you think that each of TWO GENERAL FACTORS might influence a successful outcome if you were to choose the risky alternative.

1. One general factor relates to your perception of the degree to which a successful outcome in the risky alternative would be influenced by your own ability or effort (or both).
2. The other general factor relates to your perception of the degree to which a successful outcome in the risky alternative would be influenced by chance or other factors outside of your own personal control -- that is, by impersonal factors.

In order to indicate your assessment in each situation of the relative influence of each of these two factors (personal control and nonpersonal control), we are providing two 100-point scales for each situation. Along the first 100-point scale, you are asked to indicate the amount of ability and effort that you think would influence a successful outcome in your case; and along the second 100-point scale, you are asked to indicate the degree to which you think that a successful outcome in your case would be determined by factors beyond your personal control -- by chance, luck or environmental factors over which you personally have no control.

-2-

In estimating the degree to which your own ability and effort on the one hand, and chance or personally noncontrollable factors on the other hand, would influence an outcome, the total influence of the two factors should sum to 100.

In each of the 12 situations you might reach any one of three possible conclusions; for you might decide that a successful outcome in the risky alternative

- (1) would be influenced largely or completely by your own ability and effort, with chance and noncontrollable factors exerting little or no influence; OR
- (2) would be influenced largely or completely by chance and other factors beyond your personal control, with ability and effort exerting little or no influence; OR
- (3) would be influenced equally by ability and effort on the one hand, and chance and noncontrollable factors on the other hand.

Exact copies of these two scales appear directly below:

1. Personal Ability and Effort Scale

0 10 20 30 40 50 60 70 80 90 100

My own ability
and effort would
have no influence

My own ability
and effort would
have complete
influence

2. Chance and Noncontrollable Factors Scale

0 10 20 30 40 50 60 70 80 90 100

Chance and non-
controllable
factors would
have no influence

Chance and non-
controllable
factors would
have complete
influence

-3-

You will notice that each scale is constructed in such a way that, on both scales,

- a. the zero (0) point represents NO INFLUENCE of that particular factor;
- b. the 100 point represents COMPLETE INFLUENCE of that particular factor;
- c. 50, the scale's midpoint, represents 50% INFLUENCE of that particular factor, and
- d. increasing numerical values between 0 and 100 represent increasing amounts of influence.

Because the two scales operate in conjunction with one another, whatever influence that is not attributable to one GENERAL FACTOR must be assigned to the other GENERAL FACTOR in order that the amounts assigned to the two scales, when added together, will total exactly to 100.

A General Procedure That You Could Follow:

1. Read a situation carefully; note the nature of the risky alternative; and then decide whether a successful outcome in the risky alternative.
 - a. would depend more on ability and effort than on chance and noncontrollable factors, OR
 - b. would depend more on chance and noncontrollable factors than on ability and effort, OR
 - c. would depend equally on both factors.
2. Then assign numerical values to the two scales that will reflect the approximate amount of influence (some percentage of 100) that you think each factor would exert. In order to achieve a total of 100,
 - a. assigning 50 to one scale requires assigning 50 to the other scale;
 - b. assigning 60 to one scale requires assigning 40 to the other scale;
 - c. assigning 70 to one scale requires assigning 30 to the other scale;
 - d. assigning 80 to one scale requires assigning 20 to the other scale;
 - e. assigning 90 to one scale requires assigning 10 to the other scale;
 - f. assigning 100 to one scale requires assigning 0 to the other scale.

Some Reminders

Every situation is different from every other situation. So please do not expect to produce a consistent pattern of assessments. (It is only the very rare person who would perceive every situation as involving the exact same proportions of ability and effort on the one hand, and of chance and lack of control on the other hand.)

There is no such thing as a "right" or a "wrong" assessment of any particular situation.

Situation 1

You are an electrical engineer. You are married and have one child. Since graduating from college 5 years ago, you have been working in a large electronics corporation where you are assured of a lifetime job with a modest, though adequate, salary as well as liberal pension benefits upon retirement.

The founder and owner of a small newly formed electronics firm offers you a job with his new company as one of the company's two most important members. The new company's owner has had many years of experience in selling electronics and has a reputation in the trade as a skillful, persuasive, and highly successful salesman.

This new company faces competition from large electronics firms, so that its future is uncertain. However, on the basis of careful assessments of estimated markets, the degree of demand for the company's special services, and the company's projected earnings, the owner estimates that his new company will have competitive advantages. For the new company's smallness will permit its personnel to produce quality items and give personalized service.

You and the owner would be the new company's two key members, and your own performance as an electrical engineer would play a crucial role in the quality of the items produced.

Accepting this new job would enable you to earn considerably more money than you are now earning, would give you considerable control over company policy, and would permit an eventual share in the company's ownership -- provided that the company can survive the competition of larger electronics firms. However, if the company should fail, you might find yourself without a job.

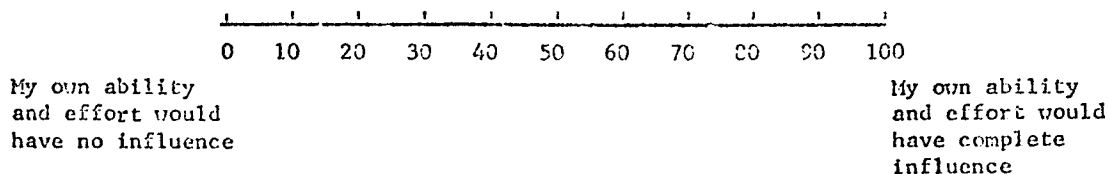
In this situation, the conservative alternative represents the decision to remain on in your present job, and the risky alternative represents the decision accept the new job.

Instructions

In responding to each of the two scales below, please note that both scales relate only to the RISKY ALTERNATIVE. Please be sure to circle only one number on each scale and be sure that your two circled numbers sum to an exact total of 100.

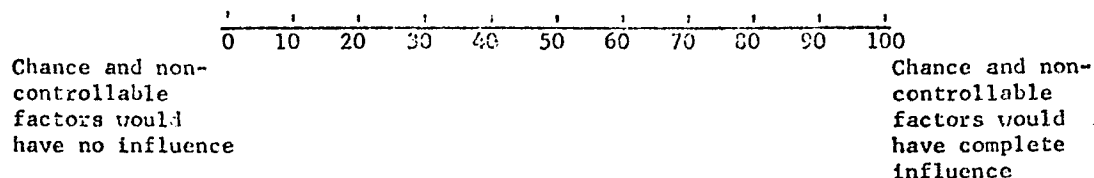
1. Personal Ability and Effort Scale

How likely do you think it is that a successful outcome in the risky alternative would be influenced by your own ability and effort?



2. Chance and Noncontrollable Factors Scale

How likely do you think it is that a successful outcome in the risky alternative would be influenced by chance or noncontrollable factors?



Situation 2

You are a 45 year old accountant. You recently suffered a heart attack. After consulting with several renowned specialists, your general physician informed you that your heart ailment was diagnosed as being so serious that you will have to change many of your strongest life habits: you will have to reduce drastically your work activities, go on a strict diet, and give up most of your favorite leisure-time pursuits.

Your team of heart specialists have indicated, however, that a delicate medical operation could be attempted. If the heart surgery were to prove successful, your heart condition would be completely remedied and you could resume a normal life. However, the success of the operation is NOT assured; in fact, the operation could prove fatal.

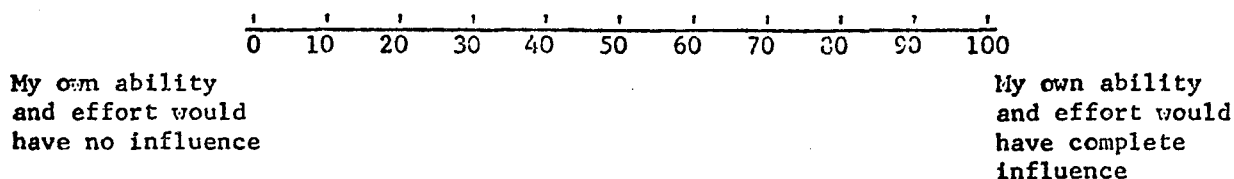
In this situation, the conservative alternative represents the decision NOT to have the operation, and the risky alternative represents the decision TO HAVE the operation.

Instructions

In responding to each of the two scales below, please note that both scales relate only to the RISKY ALTERNATIVE. Please be sure to circle only one number on each scale and be sure that your two circled numbers sum to an exact total of 100.

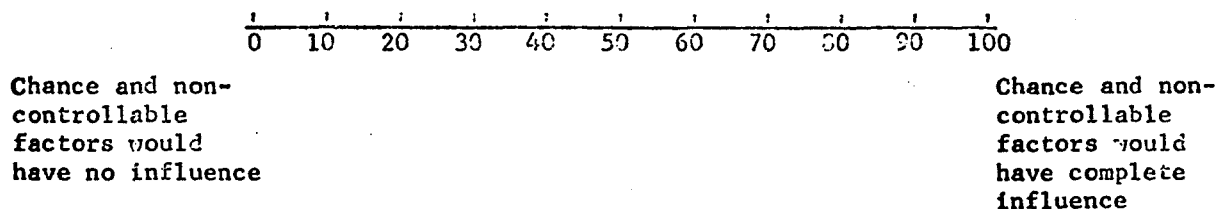
1. Personal Ability and Effort Scale

How likely do you think it is that a successful outcome in the risky alternative would be influenced by your own ability and effort?



2. Chance and Noncontrollable Factors Scale

How likely do you think it is that a successful outcome in the risky alternative would be influenced by chance or noncontrollable factors?



Situation 3

You are a married man with a wife and two children. You have a steady job that pays you about \$9,000 annually. You can afford the basic necessities of life, but few of the luxuries. A distant relative of yours recently died and left you a \$10,000 insurance policy.

You have decided to invest the \$10,000. You are well aware of the secure "blue-chip" stocks and bonds that would pay approximately 7% on your investment. On the other hand, you have heard from a close friend that the stocks of a relatively unknown company, Company X, might double their present value in one year if a new product currently being manufactured is favorably received by the buying public. If, however, the product is unfavorably received, the stocks could decline in value.

In this situation, the conservative alternative represents the decision to invest in secure "blue-chip" stocks and bonds, and the risky alternative represents the decision to invest in Company X stocks.

Instructions

In responding to each of the two scales below, please note that both scales relate only to the RISKY ALTERNATIVE. Please be sure to circle only one number on each scale and be sure that your two circled numbers sum to an exact total of 100.

1. Personal Ability and Effort Scale

How likely do you think it is that a successful outcome in the risky alternative would be influenced by your own ability and effort?

0 10 20 30 40 50 60 70 80 90 100

My own ability
and effort would
have no influence

My own ability
and effort would
have complete
influence

2. Chance and Noncontrollable Factors Scale

How likely do you think it is that a successful outcome in the risky alternative would be influenced by chance or noncontrollable factors?

0 10 20 30 40 50 60 70 80 90 100

Chance and non-
controllable
factors would
have no influence

Chance and non-
controllable
factors would
have complete
influence

Situation 4

You are the quarterback of College X's football team. College X is playing its final game of the season with its traditional rival, College Y. During the past season, College X and College Y have won an equal number of games. Consequently, this game will determine which college will win the series.

The game is in its final seconds of play and your team, College X, is behind in the score. College X has time to run just one more play. The rules require that the clock must stop after just one more play, with no continued playoff in case of a tie. As the team's quarterback, you must decide whether it would be best (1) to follow a tactic that would almost certainly result in a tie score with neither team emerging as a victor in the series, or (2) to decide on a more complicated and risky play that could bring victory if it succeeded, but defeat if it failed.

In making your decision, you need not concern yourself about the competency of your teammates or their ability to implement your strategy; for past experience has indicated both the willingness and ability of your teammates to respond positively to your leadership.

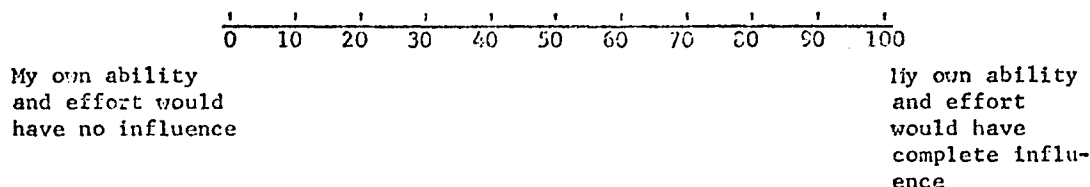
In this situation, the conservative alternative represents the decision to follow a tactic that would almost certainly result in a tie score, and the risky alternative represents the decision to attempt the more complicated and risky play.

Instructions

In responding to each of the two scales below, please note that both scales relate only to the RISKY ALTERNATIVE. Please be sure to circle only one number on each scale and be sure that your two circled numbers sum to an exact total of 100.

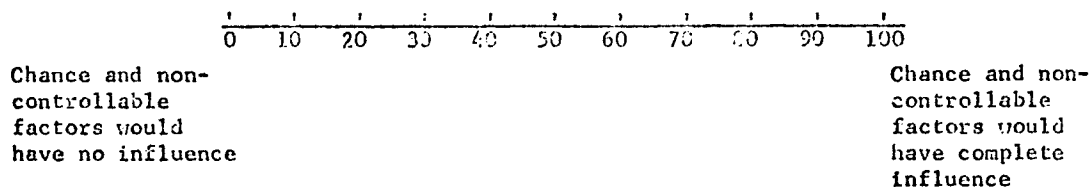
1. Personal Ability and Effort Scale

How likely do you think it is that a successful outcome in the risky alternative would be influenced by your own ability and effort?



2. Chance and Noncontrollable Factors Scale

How likely do you think it is that a successful outcome in the risky alternative would be influenced by chance or noncontrollable factors?



Situation 5

You are the president of a very prosperous light-metals corporation in the United States. For purposes of business expansion, you are planning to build an additional plant in a new location.

You are considering two choices of a new location for this new plant. You could build a new plant in the United States, where there would be only a moderate return on your initial investment; or you could build a plant in a small foreign country.

There are certain advantages to building the plant in the small foreign country: lower labor costs; easy access to raw materials; and low capital-gains taxes--all of which would yield a higher return on your initial investment than would be the case if you were to build the plant in the U.S. However, there are also certain possible disadvantages to building in the foreign country: the foreign country has a history of political instability and revolutions, and a leader of a minority party there is committed to nationalization--that is, to taking control over all foreign investments.

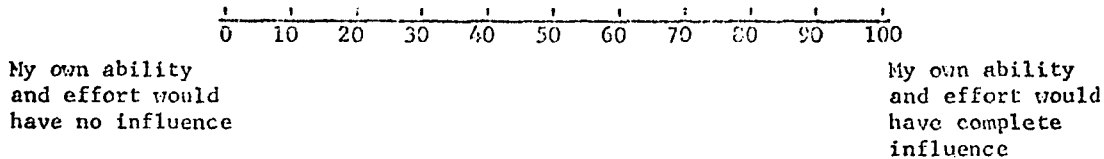
In this situation, the conservative alternative represents the decision to build your new plant in the U.S., and the risky alternative represents the decision to build your plant in the small foreign country.

Instructions

In responding to each of the two scales below, please note that both scales relate only to the RISKY ALTERNATIVE. Please be sure to circle only one number on each scale and be sure that your two circled numbers sum to an exact total of 100.

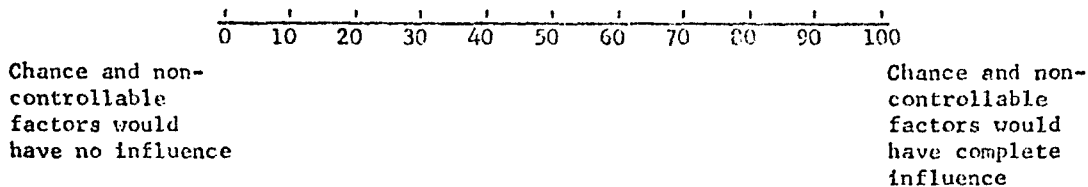
1. Personal Ability and Effort Scale

How likely do you think it is that a successful outcome in the risky alternative would be influenced by your own ability and effort?



2. Chance and Noncontrollable Factors Scale

How likely do you think it is that a successful outcome in the risky alternative would be influenced by chance or noncontrollable factors?



Situation 6

You are currently a college senior. You are very eager to pursue an active career as a psychologist and therefore wish to engage in graduate study in psychology leading to the Doctor-of-Psychology degree. You have been accepted by both University X and also by University Y.

University Y's psychology department has a reputation as being quite mediocre and, therefore, the department's graduates do not always have an opportunity for good jobs. However, almost everyone admitted to College Y does receive a degree.

On the other hand, University X has a national reputation for excellence in psychology, and a degree from University X would afford you not only excellent training, but also the promise of eligibility for a wider range of worthwhile jobs in psychology after graduation. While University X's standards are so rigorous that only a certain percentage of candidates actually receive a degree, it has generally been found that students who apply themselves to their studies are among those who do graduate.

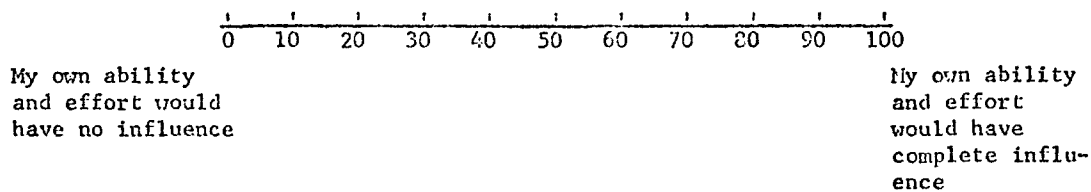
In this situation, the conservative alternative represents the decision to enter University Y, and the risky alternative represents the decision to enter University X.

Instructions

In responding to each of the two scales below, please note that both scales relate only to the RISKY ALTERNATIVE. Please be sure to circle only one number on each scale and be sure that your two circled numbers sum to an exact total of 100.

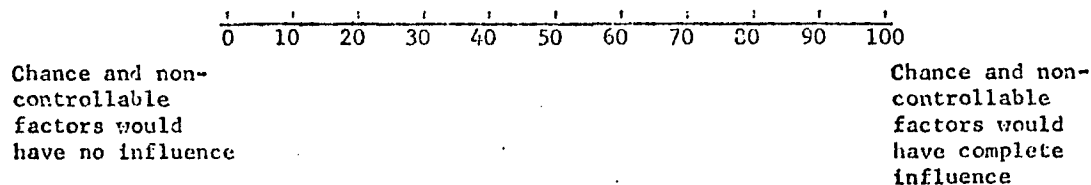
1. Personal Ability and Effort Scale

How likely do you think it is that a successful outcome in the risky alternative would be influenced by your own ability and effort?



2. Chance and Noncontrollable Factors Scale

How likely do you think it is that a successful outcome in the risky alternative would be influenced by chance or noncontrollable factors?



Situation 7

You are a very competent chess player. You are currently participating in the final game of a national chess tournament. Your opponent is last year's champion. As it happens, in this tournament you and your opponent have each won an equal number of games.

During the course of this final game, you note the possibility of a deceptive and risky maneuver. If successful, the risky maneuver would bring you a victory. If the attempted maneuver should fail, however, you would be left in an exposed position and your opponent would be almost certain to win this final game.

In this situation, the conservative alternative represents the decision NOT to make the risky maneuver, and the risky alternative represents the decision TO ATTEMPT the risky maneuver.

Instructions

In responding to each of the two scales below, please note that both scales relate only to the RISKY ALTERNATIVE. Please be sure to circle only one number on each scale and be sure that your two circled numbers sum to an exact total of 100.

1. Personal Ability and Effort Scale

How likely do you think it is that a successful outcome in the risky alternative would be influenced by your own ability and effort?

0 10 20 30 40 50 60 70 80 90 100

My own ability
and effort would
have no influence

My own ability
and effort
would have
complete influ-
ence

2. Chance and Noncontrollable Factors Scale

How likely do you think it is that a successful outcome in the risky alternative would be influenced by chance or noncontrollable factors?

0 10 20 30 40 50 60 70 80 90 100

Chance and non-
controllable
factors would
have no influence

Chance and non-
controllable
factors would
have complete
influence

Situation 8

You are a college senior with a pre-medical college background, and you have been accepted in a good medical school. However, you have also studied the piano since early childhood and have won national amateur prizes, have given several small piano recitals, and have been adjudged by musical experts as having a high potential as a concert pianist.

You are now confronted with the necessity for choosing between a career in medicine and a career in music. If you were to choose the career of a physician, you would have considerable assurance of a certain amount of prestige and of financial rewards. On the other hand, if you were to enter a conservatory of music for advanced training, you would have no guarantee that, after graduation, you would attain success or renown as a concert pianist because the possibilities for success and renown are less great in the musical field than they are in the medical field.

Your personal commitment to music is deep; and if considerations of financial success and renown were not a factor, your preference would be to pursue a musical career.

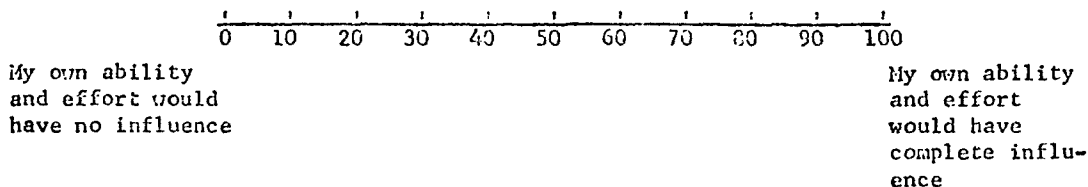
In this situation, the conservative alternative represents the decision to go to medical school, and the risky alternative represents the decision to go to the conservatory of music.

Instructions

In responding to each of the two scales below, please note that both scales relate only to the RISKY ALTERNATIVE. Please be sure to circle only one number on each scale and be sure that your two circled numbers sum to an exact total of 100.

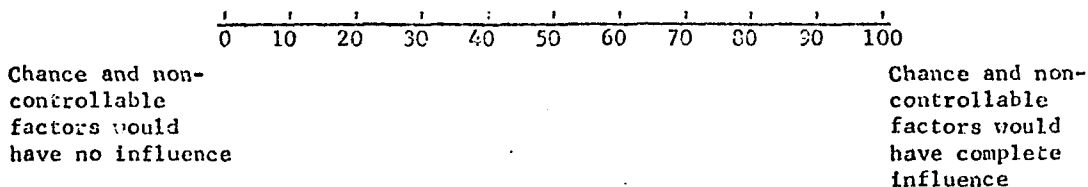
1. Personal Ability and Effort Scale

How likely do you think it is that a successful outcome in the risky alternative would be influenced by your own ability and effort?



2. Chance and Noncontrollable Factors Scale

How likely do you think it is that a successful outcome in the risky alternative would be influenced by chance or noncontrollable factors?



Situation 9

You are in the armed services and have been fighting in a war in a foreign country. You were captured by the enemy several months ago and have been in a prisoner-of-war camp ever since. Conditions in the camp are quite bad: you spend long hours at hard physical labor; you are kept at almost starvation level; the barracks to which you are assigned are infested with rats; and you are frequently subjected to periods of interrogation, sometimes accompanied by torture.

You have just discovered that there is a possibility of escaping from the prisoner-of-war camp by concealing yourself in a truck that shuttles in and out of the camp. If you are successful in devising some plan for entering and concealing yourself in the truck without detection, your escape will be assured. However, if your plan should not work, your detection by the enemy could result in your being executed.

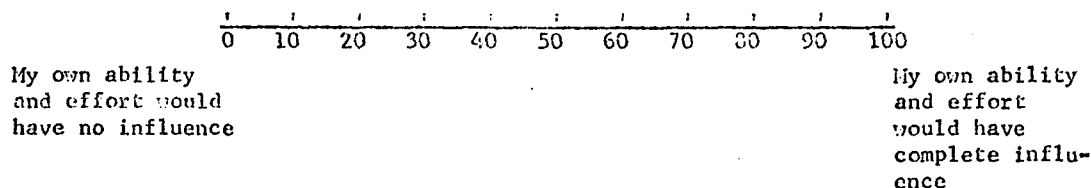
In this situation, the conservative alternative represents the decision NOT to attempt to escape, and the risky alternative represents the decision TO MAKE the attempt to escape.

Instructions

In responding to each of the two scales below, please note that both scales relate only to the RISKY ALTERNATIVE. Please be sure to circle only one number on each scale and be sure that your two circled numbers sum to an exact total of 100.

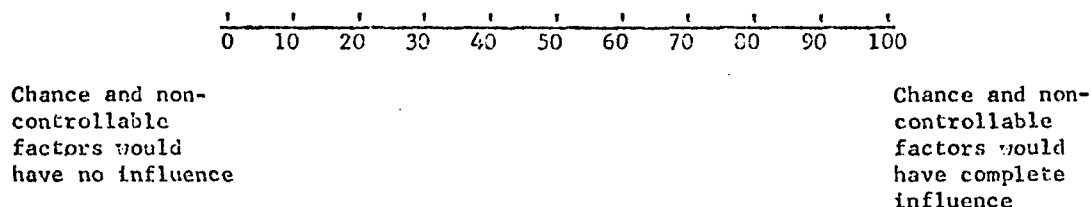
1. Personal Ability and Effort Scale

How likely do you think it is that a successful outcome in the risky alternative would be influenced by your own ability and effort?



2. Chance and Noncontrollable Factors Scale

How likely do you think it is that a successful outcome in the risky alternative would be influenced by chance or noncontrollable factors?



Situation 10

For many years you have been a successful member of the City Council and your various civic activities have won for you a considerable amount of favorable publicity and local fame. You have been approached by leaders of your political party as a possible congressional candidate in the next election. Your party is the minority one in your district, although several of your party's members have won elections in the past.

Failure to win the election might jeopardize your career at the local level as the campaign would expose you to the attacks of your political opponents. On the other hand, success is possible provided that you can, through the use of political polls and analysts, identify and then support those issues that are important to a majority of your constituents. This approach has been identified by political analysts as having contributed to the success of other members of your party who have won past elections in your district.

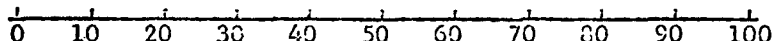
In this situation, the conservative alternative represents the decision NOT to be a congressional candidate, and the risky alternative represents the decision TO BECOME the congressional candidate.

Instructions

In responding to each of the two scales below, please note that both scales relate only to the RISKY ALTERNATIVE. Please be sure to circle only one number on each scale and be sure that your two circled numbers sum to an exact total of 100.

1. Personal Ability and Effort Scale

How likely do you think it is that a successful outcome in the risky alternative would be influenced by your own ability and effort?

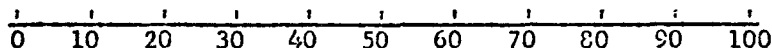


My own ability
and effort would
have no influence

My own ability
and effort would
have complete
influence

2. Chance and Noncontrollable Factors Scale

How likely do you think it is that a successful outcome in the risky alternative would be influenced by chance or noncontrollable factors?



Chance and non-
controllable
factors would
have no influence

Chance and non-
controllable
factors would
have complete
influence

Situation 11

You are a married, 30 year-old research physicist who has been given a five-year appointment by a major university laboratory. You have a choice of working on one of two types of projects: (1) You could follow the procedure of most of your associates -- that of working on a series of short-term problems of limited scope where solutions are relatively easy to find but where the outcomes would not be labeled as major contributions to your field; (2) On the other hand, you could work on a difficult, long-term problem. If a solution could be found, you would have resolved a basic scientific issue of crucial concern in your field. As a consequence, you could become eligible for a Nobel prize.

Failure to solve the long-term problem would leave you little to show for your five years of work in the laboratory and might make it more difficult for you to get a good job at the end of the five years. However, students of the sociology of science have found that success in achieving scientific breakthroughs is usually dependent upon (a) an exhaustive review of the literature relative to the problem; (b) a careful definition of the problem; and (c) perseverance over a few years in conducting experimental tests of crucial hypotheses.

In this situation, the conservative alternative represents the decision to work on short-term, unimportant problems; and the risky alternative represents the decision to work on the long-term, highly important problem.

Instructions

In responding to each of the two scales below, please note that both scales relate only to the RISKY ALTERNATIVE. Please be sure to circle only one number on each scale and be sure that your two circled numbers sum to an exact total of 100.

1. Personal Ability and Effort Scale

How likely do you think it is that a successful outcome in the risky alternative would be influenced by your own ability and effort?

0 10 20 30 40 50 60 70 80 90 100

My own ability
and effort would
have no influence

My own ability
and effort would
have complete
influence

2. Chance and Noncontrollable Factors Scale

How likely do you think it is that a successful outcome in the risky alternative would be influenced by chance or noncontrollable factors?

0 10 20 30 40 50 60 70 80 90 100

Chance and non-
controllable
factors would
have no influence

Chance and non-
controllable
factors would
have complete
influence

Situation 12

You have been dating Miss T for two years, seeing her about twice weekly. Both you and Miss T wish to get married as you are deeply in love. However, you are both concerned about the fact that you have had a number of arguments that indicate sharp differences of opinion in the way each of you views certain matters.

Miss T has been offered a job that will take her out of the country for a period of 5 years. She will accept the job only if you both decide not to marry. Because Miss T must make her decision about the job quite soon, you and Miss T decide to seek professional advice from a marriage counselor as to whether your differences of opinion would impede a happy marriage.

On the basis of these meetings with the marriage counselor, you both come to realize that while a marriage is more apt to endure if both partners agree on basic issues, nevertheless serious disagreements need not threaten the happiness of marriage, especially if both partners attempt to reconcile differences whenever they arise.

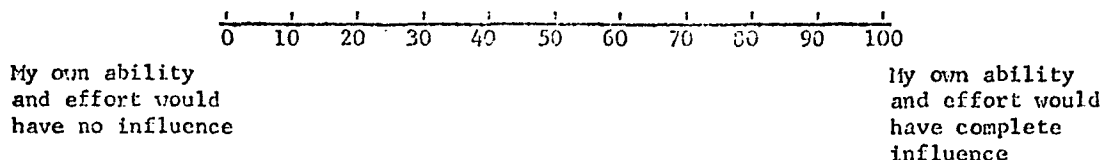
In this situation, the conservative alternative represents the decision NOT to marry Miss T, and the risky alternative represents the decision TO MARRY Miss T.

Instructions

In responding to each of the two scales below, please note that both scales relate only to the RISKY ALTERNATIVE. Please be sure to circle only one number on each scale and be sure that your two circled numbers sum to an exact total of 100.

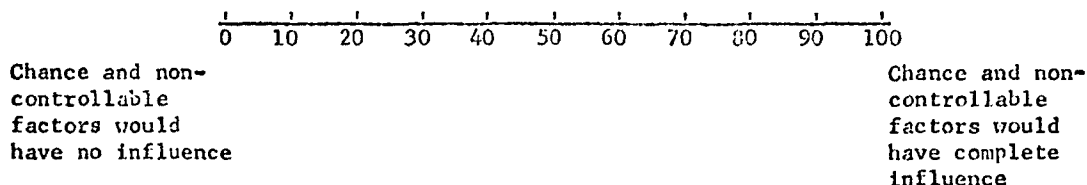
1. Personal Ability and Effort Scale

How likely do you think it is that a successful outcome in the risky alternative would be influenced by your own ability and effort?



2. Chance and Noncontrollable Factors Scale

How likely do you think it is that a successful outcome in the risky alternative would be influenced by chance or noncontrollable factors?



APPENDEIX D

Table 1

Means, Standard Deviations and Range of Responses
for 29 Ss (10 ICs, 10 ECs and 9 Ambis)
on Three Skill- and Three Chance-Determined Situations

	S I T U A T I O N S											
	Skill-Determined				Ambiguous				Chance-Determined			
	1	4*	6*	11*	7	8	9	12	2**	3**	5**	10
<u>ICs</u>												
M	6.9	7.1	8.6	8.5	7.4	6.8	5.7	6.6	1.6	2.4	4.7	6.6
SD	1.5	1.7	1.5	1.7	1.9	2.4	3.0	2.1	1.9	3.7	2.4	1.7
Range	5-9	5-10	6-10	3-10	5-10	1-10	0-10	4-10	0-5	0-10	0-9	4-10
<u>AMBIs</u>												
M	6.2	7.2	8.8	7.1	4.3	7.1	6.2	6.1	3.8	1.3	2.4	5.7
SD	1.1	1.6	6.3	1.3	2.9	2.0	1.3	2.2	1.1	1.6	6.3	1.3
Range	4-8	5-9	8-10	5-9	0-8	6-9	2-9	4-10	1-10	0-5	0-5	1-8
<u>ECs</u>												
M	6.3	6.7	8.9	7.5	5.8	6.3	5.9	6.1	1.7	1.5	5.0	5.6
SD	2.3	2.4	1.0	1.1	2.6	2.5	1.7	2.6	2.1	1.8	2.3	2.3
Range	4-8	1-9	7-10	5-9	4-10	2-9	3-9	0-9	0-6	0-5	2-9	2-8

*Skill-determined tasks that reflect for all Ss (and for all Groups) the highest means and a moderate standard deviation (except for Ambis in Situation No. 6).

**Chance-determined tasks that reflect for all Ss (and for all Groups) the lowest means and a moderate standard deviation (except for Ambis in Situation No. 5).

Medians and Deviations Therefrom, Reflecting the Amount of Perceived Personal Control

Over Outcomes Among ICs, ECs and Ambis in Three Types of Situations as

Measured Along a Scale of "0" through "10"¹

S	I-E Scale Scores Median			THREE TYPES OF RISK-TAKING DECISION - MAKING SITUATIONS							
	Rotter Score	Mirels Score	Median	Skill (1)(4)(6)(11)	f of (- scores)	Ambiguous (7)(8)(9)(12)	f of (- scores)	Chance (2)(3)(5)(10)	f of (+ scores)		
1	4	1	8	+1 -3 +1 +2	1	-1 +2 -8 +2	2	-3 +2 -3 -4	1		
2	5	1	8	0 0 -2 +2	1	0 -7 +2 +2	1	-3 -6 -2 +2	1		
3	6	2	8	-2 +2 +2 +2	1	-2 -1 0 +1	2	-7 -8 -2 +1	1		
4	6	2	6	-1 +2 +3 +3	1	+3 +1 0 0	0	-4 -6 -0 0	0		
5	7	2	5	+2 +4 +1 -2	1	0 -1 0 -1	2	-2 -2 -2 +1	1		
6	7	5	6	0 +1 +3 +2	0	+4 +2 0 0	0	-6 -6 -6 +1	1		
7	9	3	5	0 0 +3 +3	0	0 +2 +3 0	0	-5 -4 -2 +3	1		
8	9	4	6	0 +2 +2 +3	0	+3 +3 -1 -1	2	-6 -5 -0 +1	1		
9	9	4	5	+4 0 +5 +5	0	0 +3 -4 0	1	-5 -5 -2 +1	1		
10	9	6	7	+1 -1 +3 +1	1	+3 0 +1 -1	1	-7 0 +2 -2	1		

¹ "0" scores represent a given S's zero deviation from his own median.

"+" scores represent a given S's deviation from his own median in the plus direction.

"-" scores represent a given S's deviation from his own median in the minus direction.

TABLE 2 (Cont.)

Medians and Deviations Therefrom, Reflecting the Amount of Perceived Personal Control
Over Outcomes Among ICs, ECs and Ambis in Three Types of Situations as
Measured Along a Scale of "0" through "10"¹

S	I-E Scale Scores		Median	THREE TYPES OF RISK-TAKING DECISION - MAKING SITUATIONS									
	Rotter Score	Mirels Score		Skill (1)(4)(6)(11)	f of (- scores)	Ambiguous (7)(8)(9)(12)	f of (- scores)	Chance (2)(3)(5)(10)	f of (+ scores)				
11	10	4	7	-2 0 +2 +1	1	0 0 -2 +3	1	+3 -7 -5 0	1				
12	10	4	5	+1 +4 +3 0	0	-1 +1 0 0	1	-3 -4 -3 +1	1				
13	10	6	7	0 +1 +1 +3	0	-7 +2 +1 +2	1	-3 -7 -2 -1	0				
14	11	3	5	+1 +2 +3 +3	0	+1 0 0 0	0	-4 0 -2 +1	1				
15	11	5	7	0 -1 +2 +2	1	+1 +2 +1 -3	1	-5 -6 -4 0	0				
16	12	4	5	+1 0 +4 +4	0	-4 +3 +1 0	1	-2 -5 -4 +3	1				
17	12	6	3	+1 +6 +6 +6	0	0 +2 -1 -3	2	-2 -3 0 -2	0				
18	12	6	8	-1 -1 +2 +1	1	-3 0 +1 0	1	0 -3 -8 -5	0				
19	13	6	7	+1 =2 +2 +2	1	-2 0 +1 +2	1	-4 -7 -4 +1	1				

¹"0" scores represent a given S's zero deviation from his own median.

"+" scores represent a given S's deviation from his own median in the plus direction.

"-" scores represent a given S's deviation from his own median in the minus direction.

TABLE 2 (Cont.)

Medians and Deviations Therefrom, Reflecting the Amount of Perceived Personal Control .

Over Outcomes Among ICs, ECs and Ambis in Three Types of Situations as

Measured Along a Scale of "0" through "10"¹

S	I-E Scale Scores		Median	THREE TYPES OF RISK-TAKING DECISION - MAKING SITUATIONS							
	Rotter Score	Mirels Score		Skill (1)(4)(6)(11)	f of (- scores)	Ambiguous (7)(8)(9)(12)	f of (- scores)	Chance (2)(3)(5)(10)	f of (+ scores)		
20	14	7	7	-2 0 +3 +1	1	+3 -1 +1 +2	1	-7 -7 0 -3	0		
21	14	5	6	+1 0 +1 -1	1	0 +1 -1 -1	2	-2 -3 +1 +2	2		
22	14	7	6	-1 +3 +3 +2	1	+2 +3 +1 0	0	-6 -6 -2 +1	1		
23	15	6	5	+5 0 +4 +2	0	0 +2 0 0	0	-3 -5 -3 0	0		
24	17	7	7	0 -6 +2 0	1	0 +2 -2 2	1	-7 -6 0 +1	1		
25	17	8	6	+2 +3 +3 +3	0	-6 -6 +3 -1	3	-5 -6 -1 +1	1		
26	18	7	5	0 +3 +5 +3	0	-1 0 -2 -5	3	-5 -3 +4 -3	1		
27	18	7	7	0 +1 +2 +2	0	-2 0 -2 +1	2	-1 -3 -4 +1	1		
28	21	10	7	+1 +2 +3 0	0	+1 +1 0 +2	0	-3 -2 -5 -5	0		
29	21	10	5	-1 0 +2 +2	1	0 -3 0 0	1	-5 -5 0 0	0		

¹ "0" scores represent a given S's zero deviation from his own median."+" scores represent a given S's deviation from his own median in the plus direction."- " scores represent a given S's deviation from his own median in the minus direction.

APPENDIX D

Table 3

Frequency Distribution of Medians Across All Ss

Median Score ¹	Skill Situations				Ambiguous Situations				Chance Situations			
	(1)	(4)	(6)	(11)	(7)	(8)	(9)	(12)	(2)	(3)	(5)	(10)
-8							1			1	1	
-7					1	1			4	4		
-6		1			1				3	7	1	
-5								1	6	<u>5</u>	2	2
-4					1	1	1		<u>3</u>	2	4	1
-3		1			1	1	4	2	6	5	3	2
-2	3	1	1	1	3				4	1	<u>8</u>	2
-1	4	2		1	3	3	3	5	1	2	1	1
0	<u>9</u>	9		4	10	7	9	11	1	2	6	5
+1	9	<u>4</u>	4	4	3	4	8	2			1	<u>12</u>
+2	2	5	9	<u>10</u>	1	8	1	7			1	2
+3		3	<u>10</u>	6	4	4	2	1	1			2
+4	1	2	2	1	1						1	
+5	1		2	1								
+6		1	1	1								

¹ "0" score represents the median scores of all the Ss. "+" scores represent deviations from the median scores of all Ss in the plus direction. "-" scores represent deviations from the median scores of all Ss in the minus direction. Squares around a number indicate the median score of the sum of all the Ss' scores for a single direction.

APPENDIX D

Table 4

Means, Standard Deviations and Raw Median Scores
for 29 Ss (10 ICs, 10 ECs and 9 Ambis
on Three Skill and Three Chance-Determined Situations*

	Situation Number	Mean	SD	Raw Median Score
Skill Tasks **	4	7.0	1.9	7
	6	8.8	1.1	9
	11	8.0	1.6	8
Chance Tasks ***	2	2.3	2.6	2
	3	1.8	2.5	1
	5	4.1	2.4	4

*Correlated t-tests and the Wilcoxon Matched Pairs test indicate that ALL Ss (ICs, Ambis and ECs) perceive significant differences ($p < .01$) in each of these three skill-determined tasks as contrasted with each of these three chance determined tasks.

**Ss' perceptions of personal control over situational outcomes are well above 5.0 (50% point on the Personal Ability and Effort Scale) in these three skill-determined situations.

***Ss' perceptions of personal control over situational outcomes are below 5.0 (50% on the Personal Ability and Effort Scale) in these three chance-determined situations.

APPENDIX E

MAIN STUDY: ROTTER SCORE TABLES AND TEST INSTRUMENTS

Appendix E

Table 1

Rotter Scores for Three Subgroups of Ss
and for the Total Sample

	ICs (n = 30)	Ambis (n = 30)	ECs (n = 30)	All the <u>Ss</u> (n = 90)
Mean	4.8	9.8	15.50	10.03
SD	1.69	1.49	1.98	4.71
Range	1 - 7	8 - 12	13 - 21	1 - 21

Appendix E

Table 2

Ages for the Three Subgroups of Ss and for the Total Sample

	ICs (n=30)	Ambis (n=30)	ECs (n=30)	All the <u>Ss</u> (n=90)
Mean	31.43	27.50	25.93	28.28
SD	8.44	3.24	3.18	5.94
Range	22 - 61	23 - 37	21 - 37	21 - 61

DEMOGRAPHIC QUESTIONNAIRE

General Instructions

During this session, we will be asking you to complete a series of short questionnaires to which we will want to record your answers. For purposes of processing, we would like to be able to group together the questionnaires belonging to each individual.

Many students prefer to remain anonymous. Therefore, in order to maintain anonymity and, at the same time, to be able to group together the questionnaires belonging to each individual, we request that you please use either 4 identification numbers or two false names of your own choosing at the top of each questionnaire.

It is important to remember and use the EXACT SAME IDENTIFICATION NUMBERS OR FALSE NAMES ON EACH QUESTIONNAIRE. Thus, we suggest that you select familiar numbers or names. If 4 numbers are used, select the last 4 numbers of your driver's license or of your telephone number or your social security number. If two false names are used, select a first and last name that you are familiar with.

Because responses to these questionnaires may differ for men and women, please indicate in the appropriate space on each questionnaire whether you are a male or a female.

Please Respond to the Following General Questions:

The 4 identification numbers (or the 2 false names) that you will be using throughout this study _____

Sex: Male _____ Female _____

Date of Birth: Day _____ Month _____ Year _____

College that you are currently attending: _____

Major or General Field of Interest: _____

Instructions

This is a questionnaire to find out the way in which certain important events in our society affect different people. Each item consists of a pair of alternatives lettered "a" or "b". Please select the one statement of each pair (and only one) which you more strongly believe to be the case as far as you are concerned. Be sure to select the one you actually believe to be more true rather than the one you think you should choose or the one you would like to be true. This is a measure of personal belief; obviously, there are no right or wrong answers.

Your answers to the items on this inventory are to be recorded on a separate answer sheet which is loosely inserted in this booklet. REMOVE THIS ANSWER SHEET NOW. Please print answers to ALL the questions asked by the examiner on the top part of the answer sheet; then finish reading these directions. Do not answer the items in this inventory until you have finished reading these directions.

Please answer these items carefully, but do not spend too much time on any one item. Be sure to give an answer for every choice. Find the number of the item on the answer sheet and place a check mark beside either letter "a" or "b"--whichever statement seems to be more true for you.

In some instances you may discover that you believe both statements. In such cases, be sure to select the one you more strongly believe to be the case as far as you are concerned. In other instances you might believe that both statements are untrue. In such cases, merely choose the statement which seems to be less untrue as far as you are concerned. Also, please try to respond to each item independently when making your choice; do not be influenced by your previous choices.

You may now begin to answer the items in this questionnaire.

1. a. Children get into trouble because their parents punish them too much.
b. The trouble with most children nowadays is that their parents are too easy on them.
2. a. Many of the unhappy things in people's lives are partly due to bad luck,
b. People's misfortunes result from the mistakes they make.
3. a. One of the major reasons why we have wars is because people don't take enough interest in politics.
b. There will always be wars, no matter how hard people try to prevent them.
4. a. In the long run people get the respect they deserve in this world.
b. Unfortunately, an individual's worth often passes unrecognized no matter how hard he tries.
5. a. The idea that teachers are usually unfair to students is nonsense.
b. Most students don't realize the extent to which their grades are influenced by accidental happenings.
6. a. Without the right breaks one cannot be an effective leader.
b. Capable people who fail to become leaders have usually not taken advantage of their opportunities.
7. a. No matter how hard you try some people just don't like you.
b. People who can't get others to like them don't understand how to get along with others.
8. a. Heredity plays the major role in determining one's personality.
b. It is one's experiences in life which determine what they are like.

9. a. I have often found that what is going to happen will happen.
b. Trusting to fate has never turned out as well for me as making a decision to take a definite course of action.
10. a. In the case of the well-prepared student there is rarely if ever such a thing as an unfair test.
b. Many times exam questions tend to be so unrelated to course work that studying is really useless.
11. a. Becoming a success is a matter of hard work; luck has little or nothing to do with it.
b. Getting a good job depends mainly on being in the right place at the right time.
12. a. The average citizen can have an influence in government decisions.
b. This world is run by the few people in power, and there is not much that the little guy can do about it.
13. a. When I make plans, I am almost certain that I can make them work.
b. It is not always wise to plan too far ahead because many things turn out to be a matter of good or bad fortune anyhow.
14. a. There are certain people who are just no good.
b. There is some good in everybody.
15. a. In my case getting what I want has little or nothing to do with luck.
b. Many times we might just as well decide what to do by flipping a coin.
16. a. Who gets to be the boss often depends on who was lucky enough to be in the right place first.
b. Getting people to do the right thing depends upon ability; luck has little or nothing to do with it.
17. a. As far as world affairs are concerned, most of us are the victims of forces we can neither understand, nor control.
b. By taking an active part in political and social affairs the people can control world events.
18. a. Most people don't realize the extent to which their lives are controlled by accidental happenings.
b. There really is no such thing as "luck".
19. a. One should always be willing to admit mistakes.
b. It is usually best to cover up one's mistakes.
20. a. It is hard to know whether or not a person really likes you.
b. How many friends you have depends upon how nice a person you are.
21. a. In the long run the bad things that happen to us are balanced by the good ones.
b. Most misfortunes are the result of lack of ability, ignorance, laziness, or all three.
22. a. With enough effort we can wipe out political corruption.
b. It is difficult for people to have much control over things politicians do in office.
23. a. Sometimes I can't understand how teachers arrive at the grades they give.
b. There is a direct connection between how hard I study and the grades I get.
24. a. A good leader expects people to decide for themselves what they should do.
b. A good leader makes it clear to everybody what their jobs are.
25. a. Many times I feel that I have little influence over the things that happen to me.
b. It is impossible for me to believe that chance or luck plays an important role in my life.

-3-

- 26. a. People are lonely because they don't try to be friendly.
b. There's not much use in trying too hard to please people; if they like you, they like you.
- 27. a. There is too much emphasis on athletics in high school.
b. Team sports are an excellent way to build character.
- 28. a. What happens to me is mostly a matter of my own doing.
b. Sometimes I feel that I don't have enough control over the direction my life is taking.
- 29. a. Most of the time I can't understand why politicians behave the way they do.
b. In the long run the people are responsible for bad government on a national as well as on a local level.

ID: (The 4 numbers or the 2 false names you are using throughout this study)

Sex: Male _____ Female _____

Answers to 29-item Questionnaire

- | | |
|----------|----------|
| 1. | 15. |
| a. _____ | a. _____ |
| b. _____ | b. _____ |
| 2. | 16. |
| a. _____ | a. _____ |
| b. _____ | b. _____ |
| 3. | 17. |
| a. _____ | a. _____ |
| b. _____ | b. _____ |
| 4. | 18. |
| a. _____ | a. _____ |
| b. _____ | b. _____ |
| 5. | 19. |
| a. _____ | a. _____ |
| b. _____ | b. _____ |
| 6. | 20. |
| a. _____ | a. _____ |
| b. _____ | b. _____ |
| 7. | 21. |
| a. _____ | a. _____ |
| b. _____ | b. _____ |
| 8. | 22. |
| a. _____ | a. _____ |
| b. _____ | b. _____ |
| 9. | 23. |
| a. _____ | a. _____ |
| b. _____ | b. _____ |
| 10. | 24. |
| a. _____ | a. _____ |
| b. _____ | b. _____ |
| 11. | 25. |
| a. _____ | a. _____ |
| b. _____ | b. _____ |
| 12. | 26. |
| a. _____ | a. _____ |
| b. _____ | b. _____ |
| 13. | 27. |
| a. _____ | a. _____ |
| b. _____ | b. _____ |
| 14. | 28. |
| a. _____ | a. _____ |
| b. _____ | b. _____ |
| | 29. |
| | a. _____ |
| | b. _____ |

On these pages you will find a series of six situations that are likely to occur in everyday life. Situations like these, or ones highly similar to them, may confront you, personally, at some time during the course of your life. So, please try to imagine that these situations are real ones and that you are the central character in each one of them.

In each of the six situations you are confronted with a choice between a conservative (nonrisky) alternative and a risky alternative. The conservative (nonrisky) alternative involves a continuation of your present course of action and leads to a known and almost guaranteed outcome. The risky alternative, on the other hand, involves a new course of action. If successful, the risky alternative would result in a "more desirable outcome" than the one almost guaranteed by continuing with the conservative action; if unsuccessful, the risky alternative would result in a "less desirable outcome" than the one almost guaranteed by continuing with the conservative action.

For each situation, please indicate the LOWEST CHANCE (OR PROBABILITY) of success that would make it worthwhile to you to select the risky alternative.

NOTE: Please be aware that it is the LOWEST CHANCE (OR PROBABILITY) OF SUCCESS that is acceptable to you (and NOT the chance or probability of success that you would like).

NOTE: Please do NOT put any answers on these sheets. Your answers should be recorded on the appropriate answer sheets, which will be given to you.

Situation 1

You are currently a college senior. You are very eager to pursue an active career as a psychologist and therefore wish to engage in graduate study in psychology leading to the Doctor-of-Psychology degree. You have been accepted by both University X and also by University Y.

University Y's psychology department has a reputation as being quite mediocre and, therefore, the department's graduates do not always have an opportunity for good jobs. However, almost everyone admitted to College Y does receive a degree.

On the other hand, University X has a national reputation for excellence in psychology, and a degree from University X would afford you not only excellent training, but also the promise of eligibility for a wider range of worthwhile jobs in psychology after graduation. While University X's standards are so rigorous that only a certain percentage of candidates actually receive a degree, it has generally been found that students who apply themselves to their studies are among those who do graduate.

In this situation, the conservative alternative represents the decision to enter University Y, and the risky alternative represents the decision to enter University X.

Situation 2

You are a married man with a wife and two children. You have a steady job that pays you about \$9,000 annually. You can afford the basic necessities of life, but few of the luxuries. A distant relative of yours recently died and left you a \$10,000 insurance policy.

You have decided to invest the \$10,000. You are well aware of the secure "blue-chip" stocks and bonds that would pay approximately 7% on your investment. On the other hand, you have heard from a close friend that the stocks of a relatively unknown company, Company X, might double their present value in one year if a new product currently being manufactured is favorably received by the buying public. If, however, the product is unfavorably received, the stocks could decline in value.

In this situation, the conservative alternative represents the decision to invest in secure "blue-chip" stocks and bonds, and the risky alternative represents the decision to invest in Company X stocks.

Situation 3

You are a 45 year old accountant. You recently suffered a heart attack. After consulting with several renowned specialists, your general physician informed you that your heart ailment was diagnosed as being so serious that you will have to change many of your strongest life habits: you will have to reduce drastically your work activities, go on a strict diet, and give up most of your favorite leisure-time pursuits.

Your team of heart specialists have indicated, however, that a delicate medical operation could be attempted. If the heart surgery were to prove successful, your heart condition could be completely remedied and you could resume a normal life. However, the success of the operation is NOT assured; in fact, the operation could prove fatal.

In this situation, the conservative alternative represents the decision NOT to have the operation, and the risky alternative represents the decision TO HAVE the operation.

Situation 4

You are the quarterback of College X's football team. College X is playing its final game of the season with its traditional rival, College Y. During the past season, College X and College Y have won an equal number of games. Consequently, this game will determine which college will win the series.

The game is in its final seconds of play and your team, College X, is behind in the score. College X has time to run just one more play. The rules require that the clock must stop after just one more play, with no continued playoff in case of a tie. As the team's quarterback, you must decide whether it would be best (1) to follow a tactic that would almost certainly result in a tie score with neither team emerging as a victor in the series, or (2) to decide on a more complicated and risky play that could bring victory if it succeeded, but defeat if it failed.

In making your decision, you need not concern yourself about the competency of your teammates or their ability to implement your strategy; for past experience has indicated both the willingness and ability of your teammates to respond positively to your leadership.

In this situation, the conservative alternative represents the decision to follow a tactic that would almost certainly result in a tie score, and the risky alternative represents the decision to attempt the more complicated and risky play.

Situation 5

You are the president of a very prosperous light-metals corporation in the United States. For purposes of business expansion, you are planning to build an additional plant in a new location.

You are considering two choices of a new location for this new plant. You could build a new plant in the United States, where there would be only a moderate return on your initial investment; or you could build a plant in a small foreign country.

There are certain advantages to building the plant in the small foreign country: lower labor costs; easy access to raw materials; and low capital-gains taxes--all of which would yield a higher return on your initial investment than would be the case if you were to build the plant in the U.S. However, there are also certain possible disadvantages to building in the foreign country: the foreign country has a history of political instability and revolutions, and a leader of a minority party there is committed to nationalization--that is, to taking control over all foreign investments.

In this situation, the conservative alternative represents the decision to build your new plant in the U.S., and the risky alternative represents the decision to build your plant in the small foreign country.

Situation 6

You are a married, 30 year-old research physicist who has been given a five-year appointment by a major university laboratory. You have a choice of working on one of two types of projects: (1) You could follow the procedure of most of your associates -- that of working on a series of short-term problems of limited scope where solutions are relatively easy to find but where the outcomes would not be labeled as major contributions to your field; (2) On the other hand, you could work on a difficult, long-term problem. If a solution could be found, you would have resolved a basic scientific issue of crucial concern in your field. As a consequence, you could become eligible for a Nobel prize.

Failure to solve the long-term problem would leave you little to show for your five years of work in the laboratory and might make it more difficult for you to get a good job at the end of the five years. However, students of the sociology of science have found that success in achieving scientific breakthroughs is usually dependent upon (a) an exhaustive review of the literature relative to the problem; (b) a careful definition of the problem; and (c) perseverance over a few years in conducting experimental tests of crucial hypotheses.

In this situation, the conservative alternative represents the decision to work on short-term, unimportant problems; and the risky alternative represents the decision to work on the long-term, highly important problem.

ID: (Same 4 numbers or same 2 false names used on previous questionnaires)

Sex: Male _____ Female _____

Answers to Risk-Taking Questionnaire

The Choice of a University (Situation 1)

Please indicate the LOWEST chance or probability of success in obtaining a degree from the excellent university, University X, that would make it worth your while to enroll in University X.

- _____ 0 chances out of 10 of obtaining a degree from the excellent university, University X.
 - _____ 1 chance out of 10 of obtaining a degree from the excellent university, University X.
 - _____ 2 chances out of 10 of obtaining a degree from the excellent university, University X.
 - _____ 3 chances out of 10 of obtaining a degree from the excellent university, University X.
 - _____ 4 chances out of 10 of obtaining a degree from the excellent university, University X.
 - _____ 5 chances out of 10 of obtaining a degree from the excellent university, University X.
 - _____ 6 chances out of 10 of obtaining a degree from the excellent university, University X.
 - _____ 7 chances out of 10 of obtaining a degree from the excellent university, University X.
 - _____ 8 chances out of 10 of obtaining a degree from the excellent university, University X.
 - _____ 9 chances out of 10 of obtaining a degree from the excellent university, University X.
 - _____ 10 chances out of 10 of obtaining a degree from the excellent university, University X.
-

The Choice of Investments (Situation 2)

Please indicate the LOWEST chance or probability of success in doubling the value of your investment that would make it worth your while to invest in the relatively unknown company, Company X.

- _____ 10 chances out of 10 of doubling the value of my investment
 - _____ 9 chances out of 10 of doubling the value of my investment
 - _____ 8 chances out of 10 of doubling the value of my investment
 - _____ 7 chances out of 10 of doubling the value of my investment
 - _____ 6 chances out of 10 of doubling the value of my investment
 - _____ 5 chances out of 10 of doubling the value of my investment
 - _____ 4 chances out of 10 of doubling the value of my investment
 - _____ 3 chances out of 10 of doubling the value of my investment
 - _____ 2 chances out of 10 of doubling the value of my investment
 - _____ 1 chance out of 10 of doubling the value of my investment
-

Answers to Risk-Taking Questionnaire--p. 2

The Heart Operation (Situation 3)

Please indicate the LOWEST chance or probability of a successful heart operation that would make it worth your while to decide to have the heart operation.

- ☐ 0 chances out of 10 that the heart operation will be successful.
- ☐ 1 chance out of 10 that the heart operation will be successful.
- ☐ 2 chances out of 10 that the heart operation will be successful.
- ☐ 3 chances out of 10 that the heart operation will be successful.
- ☐ 4 chances out of 10 that the heart operation will be successful.
- ☐ 5 chances out of 10 that the heart operation will be successful.
- ☐ 6 chances out of 10 that the heart operation will be successful.
- ☐ 7 chances out of 10 that the heart operation will be successful.
- ☐ 8 chances out of 10 that the heart operation will be successful.
- ☐ 9 chances out of 10 that the heart operation will be successful.
- ☐ 10 chances out of 10 that the heart operation will be successful.

The Football Game (Situation 4)

Please indicate the LOWEST chance or probability of the complicated and risky tactic proving successful that would make it worth your while to select that risky tactic.

- ☐ 10 chances out of 10 that the complicated and risky tactic will be successful.
- ☐ 9 chances out of 10 that the complicated and risky tactic will be successful.
- ☐ 8 chances out of 10 that the complicated and risky tactic will be successful.
- ☐ 7 chances out of 10 that the complicated and risky tactic will be successful.
- ☐ 6 chances out of 10 that the complicated and risky tactic will be successful.
- ☐ 5 chances out of 10 that the complicated and risky tactic will be successful.
- ☐ 4 chances out of 10 that the complicated and risky tactic will be successful.
- ☐ 3 chances out of 10 that the complicated and risky tactic will be successful.
- ☐ 2 chances out of 10 that the complicated and risky tactic will be successful.
- ☐ 1 chance out of 10 that the complicated and risky tactic will be successful.
- ☐ 0 chances out of 10 that the complicated and risky tactic will be successful.

The Method of Business Expansion (Situation 5)

Please indicate the LOWEST chance or probability of success in the establishment and maintenance of a plant in the small foreign country that would make it worth your while to build your plant in that foreign country.

- ☐ 0 chances out of 10 that a plant in the foreign country will be successful.
- ☐ 1 chance out of 10 that a plant in the foreign country will be successful.
- ☐ 2 chances out of 10 that a plant in the foreign country will be successful.
- ☐ 3 chances out of 10 that a plant in the foreign country will be successful.
- ☐ 4 chances out of 10 that a plant in the foreign country will be successful.
- ☐ 5 chances out of 10 that a plant in the foreign country will be successful.
- ☐ 6 chances out of 10 that a plant in the foreign country will be successful.
- ☐ 7 chances out of 10 that a plant in the foreign country will be successful.
- ☐ 8 chances out of 10 that a plant in the foreign country will be successful.
- ☐ 9 chances out of 10 that a plant in the foreign country will be successful.
- ☐ 10 chances out of 10 that a plant in the foreign country will be successful.

Answers to Risk-Taking Questionnaire--p. 3

The Research Physicist's Work Project (Situation 6)

Please indicate the LCWEST chance or probability of success in solving the long-term, highly important problem that would make it worth your while to work on that long-term problem.

- ☐ 10 chances out of 10 of a successful solution of the long-term problem.
 - ☐ 9 chances out of 10 of a successful solution of the long-term problem.
 - ☐ 8 chances out of 10 of a successful solution of the long-term problem.
 - ☐ 7 chances out of 10 of a successful solution of the long-term problem.
 - ☐ 6 chances out of 10 of a successful solution of the long-term problem.
 - ☐ 5 chances out of 10 of a successful solution of the long-term problem.
 - ☐ 4 chances out of 10 of a successful solution of the long-term problem.
 - ☐ 3 chances out of 10 of a successful solution of the long-term problem.
 - ☐ 2 chances out of 10 of a successful solution of the long-term problem.
 - ☐ 1 chance out of 10 of a successful solution of the long-term problem.
 - ☐ 0 chances out of 10 of a successful solution of the long-term problem.
-

Sex: Male Female

No value	0	1	2	3	4	5	6	7	8	9	10	Complete value
----------	---	---	---	---	---	---	---	---	---	---	----	----------------

The Choice of Investments (Situation 2)

1. The amount of VALUE to you of doubling the present value of your investment.

	0	1	2	3	4	5	6	7	8	9	10	
No value												Complete value

2. The amount of NEGATIVE VALUE to you of a decline in the present value of your investment.

	0	1	2	3	4	5	6	7	8	9	10	
Absence of negative value												Complete negative value

3. The amount of VALUE to you of being almost guaranteed of a 7% return on the present value of your investment.

	0	1	2	3	4	5	6	7	8	9	10	
No value												Complete value

The Heart Operation (Situation 3)

1. The amount of VALUE to you of experiencing a complete recovery from the heart operation.

	0	1	2	3	4	5	6	7	8	9	10	
No value												Complete value

2. The amount of NEGATIVE VALUE to you of dying following the heart operation.

	0	1	2	3	4	5	6	7	8	9	10	
Absence of negative value												Complete negative value

3. The amount of VALUE to you of not having the operation and of leading the life of a semi-invalid.

	0	1	2	3	4	5	6	7	8	9	10	
No value												Complete value

The Football Game (Situation 4)

1. The amount of VALUE to you of winning the football game

	0	1	2	3	4	5	6	7	8	9	10	
No value												Complete value

2. The amount of NEGATIVE VALUE to you of losing the football game

	0	1	2	3	4	5	6	7	8	9	10	
Absence of negative value												Complete negative value

3. The amount of VALUE to you of being almost guaranteed of a tie score in the football game

	0	1	2	3	4	5	6	7	8	9	10	
No value												Complete value

The Method of Business Expansion (Situation 5)

1. The amount of VALUE to you of being able to establish and permanently maintain a plant in a foreign country.

	0	1	2	3	4	5	6	7	8	9	10	
No value												Complete value

2. The amount of NEGATIVE VALUE to you of the loss of a plant established in a foreign country.

	0	1	2	3	4	5	6	7	8	9	10	
Absence of negative value												Complete negative value

3. The amount of VALUE to you of being almost certain that a plant established in the U. S. would flourish.

	0	1	2	3	4	5	6	7	8	9	10	
No value												Complete value

Outcomes--p4

The Physicist's Work Project (Situation 6)

1. The amount of VALUE to you of solving the long-term, highly important problem.

C

	0	1	2	3	4	5	6	7	8	9	10	
No value												Complete value.

2. The amount of NEGATIVE VALUE to you of failure to solve the long-term; highly important problem.

	0	1	2	3	4	5	6	7	8	9	10	
Absence of negative value												Complete negative value

3. The amount of VALUE to you of being almost certain of solving short term but unimportant problems.

	0	1	2	3	4	5	6	7	8	9	10	
No value												Complete value

Sex: Male Female

Each of the six situations describes a conservative alternative and a risky alternative. The outcome of the course of action involved in the conservative alternative is KNOWN and almost completely guaranteed--i.e., there is practically no risk involved. On the other hand, the outcome of the course of action involved in the "risky" alternative is UNKNOWN and could lead either to success or to failure in attaining the end-goal associated with that risky course of action. If successful, the selection of the risky alternative would result in a "more desirable outcome" than the one almost guaranteed by selection of the conservative alternative; if unsuccessful, the selection of the risky alternative would result in a "less desirable outcome" than the one almost guaranteed by selection of the conservative alternative.

In this section, we are concerned with your view of the chances or probability that YOU, PERSONALLY, will obtain the more desirable outcome in the risky alternative.

Using the scales below, please indicate:

"your expectation of success in obtaining the more desirable outcome in the risky alternative."

The Choice of University (Situation 1)

My expectation of success in obtaining a degree from the excellent university, University X, is as follows:

	0	1	2	3	4	5	6	7	8	9	10	
Expect NO success												Expect COMPLETE success

The Choice of Investments (Situation 2)

My expectation of success in doubling the present value of my investment is as follows:

[illegible]

Expectations--p. 2

The Heart Operation (Situation 3)

My expectation of experiencing a complete recovery from the heart operation is as follows:

	0	1	2	3	4	5	6	7	8	9	10	
Expect NO success												Expect COMPLETE success

The Football Game (Situation 4)

My expectation of success in winning the football game is as follows:

	0	1	2	3	4	5	6	7	8	9	10	
Expect NO success												Expect COMPLETE success

The Method of Business Expansion (Situation 5)

My expectation of being able to establish and permanently maintain a plant in a foreign country is as follows:

	0	1	2	3	4	5	6	7	8	9	10	
Expect NO success												Expect COMPLETE success

The Physicist's Work Project (Situation 6)

My expectation of success in solving the long-term, highly important problem is as follows:

	0	1	2	3	4	5	6	7	8	9	10	
Expect NO success												Expect COMPLETE success

APPENDIX F

DEBRIEFING STATEMENT

Purpose of this Study in Risky Decision Making

What has been the purpose of this study?

The main purpose of this study was to ascertain, not your level of risk taking in hypothetical real-life situations, but rather the reasons why you adopted a particular level of risk taking. Our aim has been to study the processes that underly individual risk taking.

At present, there exist two theories concerning the factors that enter into the degree of risk that a person is willing to take in situations involving two alternative choices of action, with one or both alternatives involving some degree of risk.

According to one school of thought, a person's choice is determined by only one factor: the degree to which he or she values the potential positive and negative outcomes associated with each alternative. A second school of thought proposes that a person's choice will depend upon the relative influence of two factors: the degree of value associated with the negative and positive outcomes associated with each alternative, and the individual's own personal expectation of success (or of failure) associated with the choice of a particular outcome.

In this study there were six situations, each involving a choice between a conservative and a risky alternative. The choice of the conservative alternative meant a continuation of an existing course of action that involved certain KNOWN disadvantages but that had the advantage of avoiding the danger of a new course of action that could produce highly unpleasant consequences should that new course of action result in a failure. In sum, the choice

of the conservative alternative implied continuation of a situation involving moderate costs and moderate gains.

By contrast, choice of the risky alternative meant uncertainty as to the outcome. If successful, the outcome of the risky alternative would provide certain rewards that the conservative alternative could not afford; but if unsuccessful, the outcome of the risky alternative would result in certain disastrous consequences that would not have occurred if the conservative alternative had been selected.

In this study you were asked to think largely in terms of the risky alternative. You were asked to indicate the lowest objective odds or chances for success that would make it worth your while to select the risky alternative. You were not actually forced to select the risky alternative because you could have chosen "10 chances out of 10" in order to be willing to select the risky alternative -- i.e., you could have indicated that you required a positive guarantee of success in the risky alternative. As no such guarantee exists in a risky situation, the choice of "10 chances out of 10" in effect meant that you would NOT select the risky alternative. Despite this option of selecting the conservative alternative, the decision-making was loaded in the direction of selecting the risky alternative; and the aim was to ascertain what level of risk you would select in terms of OBJECTIVE ODDS FOR SUCCESS.

However, as we stated previously, our primary aim was not to investigate HOW MUCH RISK you would take, but rather to try to understand your reasons for selecting a certain level of risk.

Thus, after you had responded to the risk-taking questionnaire, we then asked you to indicate how much you valued positively a successful outcome in the risky alternative; how much you disvalued an unsuccessful outcome in the risky alternative; and how much you positively valued the guaranteed outcome provided by the choice of the conservative alternative. In other words, we wanted to know how you valued three potential outcomes in order to determine whether the level of your risk taking would correlate completely or only partially with how much value you placed on outcomes.

We also asked you to indicate with respect only to the risky alternative your own personal expectation as to the likelihood of a successful outcome for yourself. These questions related to "subjective expectancy of success" and were asked because, in this study, three of the six situations were ones in which an individual's own personal ability and effort could affect the success or failure of an outcome regardless of the objective odds for success. For example, in the situation involving a choice between University X (the risky alternative) and University Y (the conservative alternative), the individual knew that if he worked industriously he would be apt to be successful in obtaining a degree from University X; i.e., despite the objective odds for success that apply to all persons, specific persons could be successful in a highly risky situation if they had the confidence that the exercise of their own ability and effort would lead to a success for themselves. To be more specific, in real life we are often told that only 30 per cent of the persons who try to do a particular thing will succeed. In such a situation, if we personally have a high level

of self-confidence with respect to that particular thing, we are apt to think that we are one of the 30 per cent who will succeed. Thus, in situations whose outcomes will be affected to some degree by the person's own perceived ability and effort, subjective expectancy of success will differ from the objective expectancy or odds for success. Of course, there are some people who lack self-confidence. Such persons might regard their chances for success as being similar to the objective odds for success, or they might even feel that they would be successful only if the objective odds or chances for success were very high -- say, 80% or 90%.

Are you among the persons who have a high level of self-confidence? If so, then in skill-determined risky situations -- in situations where the exercise of personal ability and effort can affect outcomes -- we would expect your subjective expectancy of success to be high and that your selection of a personal level of risk would be based only upon how much you VALUE a successful outcome in the risky alternative, upon how much you DISVALUE an unsuccessful outcome in the risky alternative, and upon how much you value the conservative alternative's outcome.

On the other hand, if, for whatever reasons, you have a low level of self-confidence, we would expect that in skill-determined risky situations your choices would be influenced by both your subjective expectancy of success and by the positive and negative value you place, respectively, upon a successful and an unsuccessful outcome.

(Incidentally, in the 3 chance-determined situations, the person's level of self-confidence is not expected to produce a

high subjective expectancy of success. Therefore, for persons of all differing levels of self-confidence, risk taking is expected to be influenced by both subjective expectancy of success and by the valuing of outcomes.

Well, how do we establish your level of self-confidence with respect to controlling outcomes in risky situations that are skill-determined ones? We attempt to do so by measuring your degree of internality and externality. In skill-determined risky situations, internally controlled persons think that they can control situational outcomes by virtue of the exercise of their own ability and effort. On the other hand, externally controlled persons think that such outcomes are controlled by external factors -- by powerful authority figures, strong social institutions, chance factors or the "fates."

Whether or not you are internally or externally controlled relates to your own past history of successes and failures in controlling outcomes through the exercise of your own ability and effort. However, we wish to assure you that a past history of successes and failures does not necessarily relate to ACTUAL ability, but rather to whether you were repeatedly placed in situations where you had realistic opportunities for being successful by virtue of the exercise of your own ability and effort. Many situations in life really are controlled by external factors; and if you are persons whose life history has been marked by situations in which outcomes really were determined by external factors, you are apt to be externally controlled.

APPENDIX G

MULTIVARIATE ANALYSES ON SKILL AND CHANCE SITUATIONS

Table 1
Analysis of Variance for Risk Taking (p_m)
in Three Skill-Determined Situations

Source	Sum of Squares	df	Mean Squares	F	p
Locus	41.384	2	20.692	2.43	ns
Locus by <u>Ss</u>	739.745	87	8.503		
Situation	82.962	2	41.481	9.63	<.005
Locus x Situation	14.550	4	3.637	.84	ns
Residual	749.784	174	4.309		

Table 2
Analysis of Variance for Subjective Expectancy of Success (p_s)
in Three Skill-Determined Situations

Source	Sum of Squares	df	Mean Squares	F	p
Locus	15.622	2	7.811	1.22	ns
Locus by <u>Ss</u>	556.378	87	6.395		
Situation	30.866	2	15.433	5.92	<.005
Locus x Situation	5.845	4	1.461	.56	ns
Residual	453.929	174	2.609		

Table 3

Analysis of Variance for the Utility of a Success in the Risky Alternative (U_s) in Three Skill-Determined Situations

Source	Sum of Squares	df	Mean Squares	F	p
Locus	28.496	2	14.248	2.29	ns
Locus by S_s	540.823	87	6.216		
Situation	40.940	2	20.470	7.57	<.005
Locus x Situation	19.616	4	4.904	1.81	ns
Residual	505.519	174	2.703		

Table 4

Analysis of Variance for the Negative Utility of Failure in the Risky Alternative (U_f) in Three Skill-Determined Situations

Source	Sum of Squares	df	Mean Squares	F	p
Locus	40.540	2	20.270	1.81	ns
Locus by S_s	973.123	87	11.185		
Situation	13.385	2	6.692	.95	ns
Locus x Situation	15.304	4	3.826	.54	ns
Residual	1226.621	174	7.050		

Table 5

Analysis of Variance for the Utility of the Conservative
Alternative (U_c) in Three Skill-Determined Situations

Source	Sum of Squares	df	Mean Squares	F	p
Locus	33.607	2	16.804	1.31	ns
Locus by <u>Ss</u>	1116.945	87	12.838		
Situation	142.541	2	71.270	13.72	<.001
Locus x Situation	5.770	4	1.443	.28	ns
Residual	903.663	174	5.193		

Table 6

Analysis of Variance for the Utilities' Ratio (p)
in Three Skill-Determined Situations

Source	Sum of Squares	df	Mean Squares	F	p
Locus	.41974	2	.20987	2.56	ns
Locus by <u>Ss</u>	7.13337	87	.08199		
Situation	.82041	2	.41020	8.32	<.005
Locus x Situation	.04827	4	.01207	.24	ns
Residual	8.58188	174	.04932		

Table 7

Analysis of Variance for Risk Taking (p_m)
in Three Chance-Determined Situations

Source	Sum of Squares	df	Mean Squares	F	p
Locus	23.696	2	11.848	1.19	ns
Locus by <u>Ss</u>	864.323	87	9.935		
Situation	10.007	2	5.004	1.02	ns
Locus x Situation	4.415	4	1.104	.22	ns
Residual	857.548	174	4.928		

Table 8

Analysis of Variance for Subjective Expectancy of Success (p_s)
in Three Chance-Determined Situations

Source	Sum of Squares	df	Mean Squares	F	p
Locus	38.584	2	19.292	1.83	ns
Locus by <u>Ss</u>	916.957	87	10.540		
Situation	135.250	2	67.625	16.01	<.001
Locus x Situation	8.838	4	2.210	.52	ns
Residual	735.213	174	4.225		

Table 9

Analysis of Variance for the Utility of a Success in the Risky Alternative (U_s) in Three Chance-Determined Situations

Source	Sum of Squares	df	Mean Squares	F	p
Locus	37.355	2	18.677	2.09	ns
Locus by $\underline{Ss}$	774.012	87	8.897		
Situation	207.620	2	103.810	30.27	<.001
Locus x Situation	4.890	4	1.223	.36	ns
Residual	596.801	174	3.430		

Table 10

Analysis of Variance for the Negative Utility of a Failure in the Risky Alternative (U_f) in Three Chance-Determined Situations

Source	Sum of Squares	df	Mean Squares	F	p
Locus	23.207	2	11.604	.51	ns
Locus by $\underline{Ss}$	1966.811	87	22.607		
Situation	106.339	2	53.169	8.78	<.005
Locus x Situation	27.705	4	6.926	1.14	ns
Residual	1053.253	174	6.053		

Table 11

Analysis of Variance for the Utility of the Conservative
Alternative (U_c) in Three Chance-Determined Situations

Source	Sum of Squares	df	Mean Squares	F	p
Locus	41.873	2	20.936	2.08	ns
Locus by $\underline{Ss}$	874.646	87	10.053		
Situation	487.558	2	243.780	38.49	.001
Locus x Situation	31.884	4	7.971	1.26	ns
Residual	1101.858	174	6.333		

Table 12

Analysis of Variance for the Utilities' Ratio (p)
in Three Chance-Determined Situations

Source	Sum of Squares	df	Mean Squares	F	p
Locus	.63488	2	.31744	7.09	.005
Locus by $\underline{Ss}$	3.89475	87	.04476		
Situation	4.19587	2	2.09793	44.26	.001
Locus x Situation	.15213	4	.03803	.80	ns
Residual	8.24771	174	.04740		

APPENDIX H

MULTIVARIATE ANALYSES ON COMBINED SKILL AND CHANCE SITUATIONS

Table 1
Analysis of Variance for Risk Taking (p_m)
in the Combined Skill- and Combined Chance-Determined Situations

Source	Sum of Squares	df	Mean Squares	F	p
Locus	185.033	2	92.516	2.60	ns
Locus by <u>Ss</u>	3144.966	87	36.149		
Situation	1175.556	1	1175.556	61.25	<.001
Locus x Situation	10.211	2	5.106	.27	ns
Residual	1667.126	87	19.192		

Table 2
Analysis of Variance for Subjective Expectancy of Success (p_s)
in the Combined Skill- and Combined Chance-Determined Situations

Source	Sum of Squares	df	Mean Squares	F	p
Locus	125.678	2	62.839	1.74	ns
Locus by <u>Ss</u>	3149.966	87	36.206		
Situation	880.022	1	880.022	60.29	<.001
Locus x Situation	36.944	2	18.472	1.2	ns
Residual	1269.951	87	14.597		

Table 3

Analysis of Variance for the Utility of a Success in the
Risky Alternative (U_s) in Combined Skill- & Chance-Determined Situations

Source	Sum of Squares	df	Mean Squares	F	p
Locus	184.877	2	92.439	2.68	ns
Locus by $\underline{Ss}$	2995.350	87	34.429		
Situation	4.672	1	4.672	.43	ns
Locus x Situation	12.678	2	6.339	.58	ns
Residual	949.134	87	10.910		

Table 4

Analysis of Variance for the Negative Utility of a Failure in the
Risky Alternative (U_f) in Combined Skill- & Chance-Determined Situations

Source	Sum of Squares	df	Mean Squares	F	p
Locus	4.044	2	2.022	.03	ns
Locus by $\underline{Ss}$	6712.199	87	77.497		
Situation	231.200	1	231.200	9.68	<.005
Locus x Situation	187.200	2	93.600	3.92	<.05
Residual	2077.423	87	23.878		

Table 5

Analysis of Variance for the Utility of the Conservative Alternative (U_c) in Combined Skill- and Combined Chance-Determined Situations

Source	Sum of Squares	df	Mean Squares	F	p
Locus	158.044	2	79.022	1.57	ns
Locus by $\underline{Ss}$	4372.116	87	50.254		
Situation	684.450	1	684.450	37.16	<.001
Locus x Situation	68.400	2	34.200	1.86	ns
Residual	1602.506	87	18.420		

Table 6

Analysis of Variance for the Utilities' Ratio (p) in the Combined Skill- and Combined Chance-Determined Situations

Source	Sum of Squares	df	Mean Squares	F	p
Locus	.24123	2	.12062	5.74	<.01
Locus by $\underline{Ss}$	1.82793	87	.02101		
Situation	.33462	1	.33462	24.09	<.001
Locus x Situation	.01692	2	.00846	.61	ns
Residual	1.20897	87	.01389		

BIBLIOGRAPHY

- Altrocchi, J., Palmer, J., Hellmann, R. & Davis, H. The Marlowe-Crowne, Repressor-Sensitizer and Internal-External Scales and attribution of unconscious hostile intent. Psychological Reports, 1968, 23, 1229-1230.
- Baron, R. Authoritarianism, locus of control and risk taking. J. Psychol., 1968, 68, 141-143.
- Burnstein, E., Miller, H., Vinokur, A., Katz, S., & Crowley, Joan. Risky Shift is eminently rational. J. pers. soc. Psychol., 1971, 20, No. 3, 462-471.
- Butterfield, E.C. Locus of control, test anxiety, reaction to frustration, and achievement attitudes. J. Pers., 1964, 32, 298-311.
- Crowne, E.P., & Liverant, S. Conformity under varying conditions of personal commitment. J. abnorm. soc. Psychol., 1963, 66, 547-555.
- Davis, W.L. & Phares, E.J. Internal-external control as a determinant of information-seeking in a social influence situation. J. Pers., 1967, 35, 547-561.
- Davis, W.L. & Phares, E.J. Parental antecedents of internal-external control of reinforcement. Psychol. Reports, 1969, 24, 427-436.
- Edwards, W. The theory of decision making. Psychol. Bull., vol 51, 1954, no. 4, 380-417.
- Edwards, W. Behavioral decision theory. Ann. Rev. Psychol., vol 12, 1961, 473-498.
- Edwards, W., Lindman, H., & Phillips, L.D. "Emerging technologies for making decisions." In New directions in psychology II. New York: Holt, Rinehart and Winston, 1965, 259-325.
- Efran, J. Some personality determinants of memory for success and failure. Unpublished doctoral dissertation, Ohio State University, 1963.
- Feather, N.T. Some personality correlates of external control. Australian J. Psychol., 1967, 19, 253-260.
- Gurin, P., Gurin, G., Lao, R., & Beattie, M. Internal-external control in the motivational dynamics of Negro youth. J. soc. Issues, 1969, 25, 29-53.

- Houtras, P.T., & Scharf, M.C. Manifest anxiety and locus of control of low-achieving college males. J. Psychol., 1970, 74, 95-100.
- James, W.H., Woodruff, A.B., & Werner, W. Effect of internal and external control upon changes in smoking behavior. J. consult. Psychol., 1965, 29, 184-186.
- Jones, S.C., & Shrauger, J.S. Locus of Control and inter-personal evaluations. J. consult. clin. Psychol., 1968, 32, 664-668.
- Julian, J.W., & Katz, S.B. Internal versus external control and the value of reinforcement. J. Pers. soc. Psychol., 1968, 8, 89-94.
- Julian, J.W., Lichtman, C.M., & Ryckman, R.M. Internal-external control and need to control. J. soc. Psychol., 1968, 76, 43-48.
- Kogan, N. & Wallach, M.A. Risk taking: A study in cognition and personality. New York: Holt, Rinehart & Winston, 1964.
- Lefcourt, H.M. Risk taking in Negro and white adults. J. Pers. soc. Psychol., 1965, 2, 765-770.
- Lefcourt, H.M., & Ladwig, G.W. The effect of reference group upon Negroes' task persistence in a biracial competitive game. J. Pers. soc. Psychol., 1965, 1, 668-682.
- Lefcourt, H.M., Lewis, L., & Silverman, I.W. Internal versus external control of reinforcement and attention in a decision-making task. J. Pers., 1968, 36, 663-682.
- Lefcourt, H.M. & Steffy, R.A. Level of aspiration, risk-taking behavior, and projective test performance: a search for coherence. J. consult. clin. Psychol., 1970, 34, 193-198.
- Lichtman, C.M. & Julian, J.W. Internal versus external control of reinforcement as a determinant of preferred strategy on a behavioral task. Paper read at Midwestern Psychological Assoc., St. Louis. 1964.
- Lipp, L., Kolstoe, R., James, W. & Randall, H. Denial of disability and internal control of reinforcement: a study using a perceptual defense paradigm. J. Consulting and Clinical Psychol., 1968, 32, 72-75.
- Liverant, S., & Scodel, A. Internal and external control as determinants of decision-making under conditions of risk. Psychol. Rep., 1960, 7, 59-67.
- MacDonald, A.P., Jr. Internal-external locus of control and the practice of birth control. Psychol. Rep., 1970, 27, 206.

- Minton, H.L., & Miller, A.G. Group risk taking and internal-external control of group members. Psychol. Rep., 1970, 26, 431-436.
- Nadien, M. Risk taking before and after group discussion as a function of personality, task perception and group membership. Unpublished paper, Hunter College, 1970.
- Odell, M. Personality correlates of independence and conformity. Unpublished Master's thesis, Ohio State University, 1959.
- Phares, E.J. Differential utilization of information as a function of internal-external control. Unpublished Doctoral Dissertation, Ohio State University, 1955.
- Phares, E.J. Expectancy changes in skill and chance situations. J. abnorm. soc. Psychol., 1957, 54, 339-342.
- Phares, E.J. Differential utilization of information as a function of internal-external control. J. Pers., 1968, 36, 649-662.
- Phares, E.J., Ritchie, D.E. & Davis, W.J. Internal-external control and reaction to threat. J. Pers. soc. Psychol., 1968, 10, 402-405.
- Platt, E.S. Internal-external control and changes in expected utility as predictors of the change in cigarette smoking following role playing. Paper presented at Eastern Psychological Association, Philadelphia, April, 1969.
- Platt, J.J. & Eisenman, R. Internal-external control of reinforcement, time perspective, adjustment and anxiety. J. gen. Psychol., 1968, 79, 121-128.
- Ray, W.J. & Katahn, M. Relation of anxiety to locus of control. Psychol. Rep., 1968, 23, 1196.
- Ritchie, E. & Phares, E.J. Attitude change as a function of internal-external control and communication status. J. Pers., 1969, 37, 429-443.
- Rotter, J.B. Social Learning and Clinical Psychology. Englewood Cliffs, N.J.: Prentice-Hall, 1954.
- Rotter, J.B. Generalized expectancies for internal versus external control of reinforcement. Psychological Monographs: General and Applied, 1966, 80, No. 1.
- Rotter, J.B., & Mulry, R.C. Internal versus external control of reinforcement and decision time. J. Pers. soc. Psychol., 1965, 2, 598-604.
- Seeman, M. Alienation and social learning in a reformatory. Amer. J. sociol. Rev., 1963, 27, 772-783.

- Seeman, M. & Evans, J.W. Alienation and learning in a hospital setting. Amer. sociol. Rev., 1962, 27, 772-783.
- Stoner, J.A.F. A comparison of individual and group decisions involving risk. Unpublished Master's thesis, Massachusetts Institute of Technology, School of Industrial Management, 1961.
- Stoner, J.A.F. Risky and cautious shifts in group decisions: The influence of widely held values. J. Exp. soc. Psychol., 1968, 4, 442-459.
- Tolor, A. & Reznikoff, J. Relation between insight, repression-sensitization, internal-external control and death anxiety. J. abnorm. Psychol., 1967, 72, 426-430.
- Vinokur, A. Cognitive and affective processes influencing risk taking in groups: an expected utility approach. J. pers. soc. Psychol., 1971, 20, No. 3, 472-486.
- Wallach, M.A., Kogan, N. Sex differences and judgment processes. J. Pers., 1959, 27, 555-564.
- Watson, D. Relationship between locus of control and anxiety. J. Pers. soc. Psychol., 1967, 6, 91-92.
- Watson, D. & Baumeister, E. Effects of locus of control and expectation of future control upon present performance. J. pers. soc. Psychol., 1967, 6, 212-215.

AUTOBIOGRAPHICAL STATEMENT

The author, Margot Nadien, was born in Montreal, Canada. Having begun composing at age seven and concertizing as a pianist at age ten, her early academic education was interrupted at age 13 so that she could devote all her energies to her career and to her music studies in New York City.

She won three National League of Canadian Composer awards for original compositions (1943, 1944, 1945) and had published six compositions for piano and for voice and piano by MacMillan Co., Toronto, Canada in 1946.

In addition to concertizing and composing, she gave private instruction in piano, theory, harmony, counterpoint and composition from 1946 to 1952 and also served as an accompanist to her concert-violinist husband from 1950 to 1952.

After permanently discontinuing her musical activities in 1952, she became the executive secretary and editorial assistant to the Executive Editor of Modern Photography and later became, from 1956 to 1958, the Assistant Editor of Music Journal, a national educator's music magazine.

In September, 1958, the author resumed her academic career, first completing four years of high school at Rhodes School in New York City and then entering Hunter College, where she majored in psychology and minored in sociology. Receiving her B.A. in 1967, she graduated first in her class (summa cum laude, 3.888 index) and was elected to Phi Beta Kappa.

In 1967 she entered the Ph.D. program in Social Psychology and Personality at CUNY. In 1969 and 1970 she co-authored two psychology journal articles.

From 1971 to 1973 she served as an adjunct at Fordham University. She is currently engaged there as a full-time instructor and will be awarded an assistant professorship upon completion of her Ph.D.

In addition to her academic activities, she has also been serving since 1950 through to the present as a combination manager, press agent and general factotum for her concert-violinist husband.