Locus of Control, Social Class, and Risk-Taking in Negro Boys.

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ROTHENBERG, Peter John, 1941-
LOCUS OF CONTROL, SOCIAL CLASS, AND RISK-TAKING IN NEGRO BOYS.

Washington University, Ph.D., 1968
Psychology, clinical

University Microfilms, Inc., Ann Arbor, Michigan
ACKNOWLEDGEMENTS

I gratefully acknowledge the cooperation of the officials and fifth grade teachers and pupils of the Enright School District of St. Louis, Missouri. Special appreciation is extended to Mr. Clifford Evans, Dr. William Pearson, Mrs. Buella Brooks, and Mr. Sam Gregory.

I should also like to acknowledge the assistance of Drs. Loretta Cass, Richard de Charms, and Robert Schaef who guided this project. Dr. de Charms, who chaired my dissertation committee, provided hours of stimulating and encouraging guidance throughout. I also acknowledge the help of the other workers on the research project, especially Mrs. Janet Collins, Mrs. Marilyn Goodman, Mrs. Lola Latta, and Mrs. Jane Landsbaum.

Finally, I'm grateful to my wife, Liz, for constructing the materials for the risk-taking games and for being a source of constant encouragement.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACKNOWLEDGEMENTS</td>
<td>ii</td>
</tr>
<tr>
<td>LIST OF TABLES</td>
<td>vi</td>
</tr>
<tr>
<td>LIST OF FIGURES</td>
<td>viii</td>
</tr>
<tr>
<td>INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>CHAPTER</td>
<td></td>
</tr>
<tr>
<td>1. BACKGROUND</td>
<td>5</td>
</tr>
<tr>
<td>Social Learning Theory and Locus of Control</td>
<td>5</td>
</tr>
<tr>
<td>Locus of Control Research Reviewed</td>
<td>9</td>
</tr>
<tr>
<td>1. Learning Studies</td>
<td>11</td>
</tr>
<tr>
<td>2. Internal-External Control as a Personality Variable</td>
<td>13</td>
</tr>
<tr>
<td>a. Measures of Internal-External Control</td>
<td>13</td>
</tr>
<tr>
<td>b. Personality Correlates</td>
<td>16</td>
</tr>
<tr>
<td>Sociological Variables</td>
<td>24</td>
</tr>
<tr>
<td>1. Social Stratification Among Negroes</td>
<td>24</td>
</tr>
<tr>
<td>2. Powerlessness and Alienation</td>
<td>29</td>
</tr>
<tr>
<td>3. Social Class, Ethnic Group, and I-E</td>
<td>31</td>
</tr>
<tr>
<td>Risk-Taking</td>
<td>37</td>
</tr>
<tr>
<td>1. Risk-Taking and Achievement Motivation</td>
<td>38</td>
</tr>
<tr>
<td>2. Risk-Taking, Intelligence and Personality Correlates</td>
<td>42</td>
</tr>
<tr>
<td>3. Risk-Taking and I-E</td>
<td>43</td>
</tr>
<tr>
<td>4. Risk-Taking, I-E and Sociological Variables</td>
<td>47</td>
</tr>
<tr>
<td>2. THE STUDY</td>
<td>51</td>
</tr>
<tr>
<td>The Problem</td>
<td>51</td>
</tr>
<tr>
<td>Variables and Their Measures</td>
<td>55</td>
</tr>
<tr>
<td>1. Locus of Control</td>
<td>55</td>
</tr>
<tr>
<td>a. Bialer's &quot;Children's Locus of Control Test&quot;</td>
<td>56</td>
</tr>
<tr>
<td>b. Battle's &quot;Children's Picture Test of Internal-External Control&quot;</td>
<td>57</td>
</tr>
</tbody>
</table>
TABLE OF CONTENTS (continued)

CHAPTER                                                                 Page

2. Social Class ................................................................. 60
   a. Warner's System .................................................. 61
   b. Measuring Middle and Low Class Negroes ............. 65
3. Risk-Taking ................................................................. 68
   a. Chance Risk-Taking Condition ............................. 69
   b. Skill Risk-Taking Condition ............................... 71
   c. Measures of Risk-Taking Strategy ...................... 72
Conceptual Hypotheses ....................................................... 77
Procedure ........................................................................ 82
Operational Hypotheses ..................................................... 88
Subjects ........................................................................... 92
Design and Analysis ........................................................... 93

3. RESULTS .......................................................................... 97
   Relationship Among Independent Variables .......... 97
   Relationship Among Dependent Variables .............. 100
   Effects of Independent Variables on Dependent Variables 106
   Tests of Hypotheses .................................................. 110
   Other Risk-Taking Measures .................................... 125

4. DISCUSSION .................................................................... 135
   A. Locus of Control, Social Class, Psychological
      Situation, and Risk-Taking .................................. 137
      Measures of I-E .................................................. 137
      I-E as Both Personality and Situational Variable .... 140
      Bieler, CPT, and Psychological Situation ............. 143
      Social Class Results .......................................... 146
   B. Comparisons With Previous Research ................ 148
   C. Major Findings Reviewed .................................... 157
   D. Suggestions for Future Research ........................ 160

REFERENCES ...................................................................... 162

APPENDICES:
   A. Bieler Questionnaire ............................................. 172
   B. CPT ....................................................................... 175
   C. Scoring Manual --- CPT ...................................... 184
   D. Warner's Occupation Scale ................................. 192
   E. Warner's House Type Scale .................................. 194
## APPENDICES

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>F. House Ratings</td>
<td>196</td>
</tr>
<tr>
<td>G. Chance Game</td>
<td>197</td>
</tr>
<tr>
<td>H. Skill Game</td>
<td>200</td>
</tr>
<tr>
<td>I. Bialer, CPT, Social Class and IQ Data</td>
<td>203</td>
</tr>
<tr>
<td>J. CPT and Social Class Data: Battle versus Present Study</td>
<td>205</td>
</tr>
<tr>
<td>K. A. Ns, Means, and Standard Deviations of Mean Ps, Mean Distance, and Skill Success Scores for Each Cell</td>
<td>206</td>
</tr>
<tr>
<td>B. Four Way Analysis of Covariance for Mean Ps.</td>
<td>208</td>
</tr>
<tr>
<td>L. Ns, Means and Standard Deviations of Change Scores for Each Cell</td>
<td>209</td>
</tr>
<tr>
<td>M. Ns, Means and Standard Deviations of Deviation Scores for Each Cell</td>
<td>210</td>
</tr>
<tr>
<td>N. A. Ns, Means and Standard Deviations of Variability Scores for Each Cell</td>
<td>212</td>
</tr>
<tr>
<td>B. Four Way Analysis of Covariance for Variability Scores</td>
<td>215</td>
</tr>
<tr>
<td>O. Use of Feedback</td>
<td>216</td>
</tr>
</tbody>
</table>
## LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Correlations between Bialer, CPT, Social Class, IQ, and Skill</td>
<td>98</td>
</tr>
<tr>
<td>2. A. Correlations among Total Risk-Taking Scores and IQ</td>
<td>101</td>
</tr>
<tr>
<td>B. Correlations among Chance Risk-Taking Scores and IQ</td>
<td>102</td>
</tr>
<tr>
<td>C. Correlations among Skill Risk-Taking Scores and IQ</td>
<td>103</td>
</tr>
<tr>
<td>D. Correlations between Chance and Skill Risk-Taking Scores</td>
<td>104</td>
</tr>
<tr>
<td>3. A. Means of Risk-Taking Scores by Chance and Skill for all Subjects</td>
<td>107</td>
</tr>
<tr>
<td>B. Analysis of Covariance for Risk-Taking Scores - Chance versus Skill</td>
<td>107</td>
</tr>
<tr>
<td>4. A. Means of Chance Mean Ps, Skill Mean Ps, Skill Mean Distance and Skill Success Scores for Bialer, CPT and Social Class Groups</td>
<td>111</td>
</tr>
<tr>
<td>B. Analysis of Covariance for Chance Mean Ps, Skill Mean Ps, Skill Mean Distance and Skill Success Scores</td>
<td>112</td>
</tr>
<tr>
<td>5. A. Means of Change Scores for Bialer, CPT and Social Class Groups</td>
<td>115</td>
</tr>
<tr>
<td>B. Analysis of Covariance for Change Scores</td>
<td>116</td>
</tr>
<tr>
<td>6. Frequency of Shots Taken at Near and Far Distances</td>
<td>122</td>
</tr>
<tr>
<td>7. A. Means of Number of Shots Taken at Far Distances</td>
<td>123</td>
</tr>
<tr>
<td>B. Analysis of Variance for Shots Taken at Far Distances</td>
<td>124</td>
</tr>
<tr>
<td>8. A. Means of Chance and Skill Deviation Scores for Bialer, CPT and Social Class Groups</td>
<td>127</td>
</tr>
<tr>
<td>B. Analysis of Covariance for Deviation Scores</td>
<td>128</td>
</tr>
<tr>
<td>Table</td>
<td>Description</td>
</tr>
<tr>
<td>-------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>9.</td>
<td>A. Means of Chance and Skill Variability Scores for Bialer, CPT and Social Class Groups</td>
</tr>
<tr>
<td></td>
<td>B. Analysis of Covariance for Variability Scores - Chance</td>
</tr>
<tr>
<td></td>
<td>C. Analysis of Covariance for Variability Scores - Skill</td>
</tr>
<tr>
<td>10.</td>
<td>Interaction Patterns among Major Variables</td>
</tr>
</tbody>
</table>
# LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figures</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Frequency of Bets (Chance) and Shots (Skill) for All Subjects</td>
<td>108</td>
</tr>
<tr>
<td>2. Frequency of Shots at Each Distance for Bialer x CPT Groups on Skill</td>
<td>118</td>
</tr>
<tr>
<td>3. Frequency of Shots at Each Distance for Bialer x Social Class Groups on Skill</td>
<td>119</td>
</tr>
<tr>
<td>4. Frequency of Shots at Each Distance for CPT x Social Class Groups on Skill</td>
<td>120</td>
</tr>
<tr>
<td>5. Frequency of Bets Taken at Various Ps Levels for Liverant and Scodel's Subjects, Lefcourt's Subjects, and Our Subjects in the Chance Condition</td>
<td>152</td>
</tr>
</tbody>
</table>
INTRODUCTION

A common theme in western philosophy is that man is responsible for his own behavior. The idea that one can and should control his own rewards and punishments is accepted by many social scientists and laymen. As Adams-Weber (1963) points out, however, the idea that man is overwhelmed by feelings of powerlessness and alienation in respect to the outcomes of his own endeavors is a popular theme in contemporary literature and is part of our present ethic. This philosophy can be found in popular literature (e.g., Baldwin, 1961) as well as sociological, psychological, and psychiatric works (for example, Seeman, 1959; Rotter et al., 1962; Horney, 1945). Rotter et al's. concept of Locus of Control represents an attempt to account for and measure the degree to which one expects that he can or cannot control what happens to him. The construct is conceived of as a "generalized expectancy for Internal vs. External [I-E] Control of Reinforcement." It distributes individuals according to the degree to which they accept personal responsibility for what happens to them, in contrast to attributing responsibility to forces outside their control such as fate, luck, chance, powerful others, or inability to comprehend the world.

Social conditions such as segregation, discrimination, and
unequal housing and employment opportunities would certain seem to facilitate the growth of an External orientation because they deny positive reinforcement despite individual achievement. In other words these conditions provide a minimum of the kinds of experiences thought to be necessary for the development and maintenance of a generalized expectancy of Internal control. Thus the Negro, especially the lower class Negro, may be thought of as a person who has a low expectancy that he can control his reinforcements. Lefcourt and Ladwig (1965a) in fact found this to be the case using both attitudinal and behavioral measures. Such expectancies result in minimal effort to achieve and lack of interest in achievement-related pursuits. Thus the lower class Negro is likely to become failure avoidant and withdraw from middle-class goals because he sees them as unobtainable through his own efforts.

Literature concerning American Negroes and/or "the lower class" often focuses on their feelings of inferiority, low self-esteem, and pessimism as well as their comparatively poor performance in intellectual, achievement, and problem-solving situations (for example, Dreger and Miller, 1960; Katz and Cohen, 1962; Lefcourt and Ladwig, 1965b; Battle and Rotter, 1963; Roen, 1960). The writer was stimulated by these studies to examine personality, sociological, and situational variables operating in Negro children which might produce these kinds of attitudes and behaviors.
Studies dealing with minority groups usually focus on differences between the "culturally deprived" (most often the lower class and/or the Negro) and other groups (most often the white middle class). Within-group differences are assumed not to exist or to be unimportant or irrelevant (Carpenter, 1967). The present study was part of a larger research project concerning achievement motivation in culturally deprived Negro children, the major focus of which was just such (within-group) differences.

Research with the Internal-External dimension has been successful in predicting many attitudinal and behavioral variables, one of which is risk-taking behavior. Internals and Externals have been shown to respond differently to various risk-taking situations. Not only does one's general expectancy for Internal versus External control influence behavior, but the specific nature of the task (or situation) also has an effect. Thus, whether the risk-taking situation is believed to be determined by chance or skill must also be taken into account. As one might expect, different ethnic and social class groups have been shown to react differently to chance- and skill-determined risk-taking and decision-making situations. The major goal of the present study was to discover relationships among personality, sociological, and situational variables which might contribute toward an increased understanding of risk-taking behavior.

Specifically, two Locus of Control (I-E) measures along with socio-
economic data were used to predict the risk-taking behavior of Negro boys in both chance- and skill-determined situations.

In what follows it is intended to review the Locus of Control literature in detail, especially as it concerns the research on related sociological variables and risk-taking behavior. Likewise, the sections concerning social class and risk-taking will emphasize theoretical and actual relationships with the Internal-External notion.
CHAPTER I

BACKGROUND

Social Learning Theory and Locus of Control

Man's ability to control his personal environment is one of the most important concerns of social science. As Rotter (1966); Lefcourt (1966) and others point out, there have been many concepts used to describe or explain the degree to which an individual can control the important events in his life space. Examples of these include notions of competence and effectance (White, 1959), helplessness and mastery (Adler, in Ansbacher and Ansbacher, 1956), hopelessness (Richter, 1959), alienation (Seeman, 1959), control from within or without (Riesman, 1954) and passivity and its relation to belief in luck and chance (Merton, 1957). Witkin's (1954) concept of field dependence-independence and various notions regarding causality (e.g., Piaget, 1930; Pepitone, 1958) may also be related. In his recent review, Internal versus External Control of Reinforcement, Lefcourt (1966) makes the point that most of the above concepts emphasize the strength of the contingency between acts and their effects (i.e., instrumentality) for survival and adequate behavior. The Locus of Control or I-E concept differs from these in that it is an expectancy variable rather than a motivational one; that is, it is not

- 5 -
concerned with whether the individual is controlled from within or without, but whether he believes that his own behavior, skills, and internal dispositions determine what reinforcements he receives.

Rotter's Social Learning Theory (1954; 1960) provides the theoretical background for the I-E Control concept. In the theory a reinforcement serves to strengthen an expectancy that a particular behavior or event will be followed by that reinforcement in the future. The potential for any behavior to occur in a given situation is seen as a function of three variables: the person's expectancy that the behavior will secure the available reinforcements, the value of the reinforcement for that person, and the psychological situation in which the sequence occurs. Whereas Lewin (1935) held that valence (reinforcement value) and subjective probability (expectancy) are inversely related, Rotter conceives of expectancy as varying independently of the value or importance of reinforcement. It is both a function of probability as calculated from reinforcement history and a generalization of expectancies from other related behavior-reinforcement sequences (Murnstein, 1963). In Rotter's words,

The role of reinforcement, reward, or gratification is universally recognized by students of human nature as a crucial one in the acquisition and performance of skills and knowledge. However, an event regarded by some persons as a reward or reinforcement may be differently perceived and reacted to by others. One of the determinants of this reaction is the degree to which the individual perceives that the reward follows from, or is contingent upon, his own behavior or attributes versus
the degree to which he feels the reward is controlled by forces outside of himself and may occur independently of his own actions. The effect of a reinforcement following some behavior on the part of a human subject, in other words, is not a simple stamping-in process but depends upon whether or not the person perceives a causal relationship between his own behavior and the reward. A perception of causal relationship need not be all or none but can vary in degree. When a reinforcement is perceived by the subject as following some action of his own but not being entirely contingent upon his action, then, in our culture, it is typically perceived as the result of luck, chance, fate, as under the control of powerful others, or as unpredictable because of the great complexity of the forces surrounding him. When the event is interpreted in this way by an individual, we have labeled this a belief in external control. If the person perceives that the event is contingent upon his own behavior or his own relatively permanent characteristics, we have termed this a belief in internal control. (Rotter, 1966, p. 1)

The I-E Control concept thus describes an attitude which, in social learning theory terms, is considered a "high level generalized expectancy". It is this attitude (alternately referred to as belief or expectancy) that determines the extent to which outcomes or consequences of behavior (reinforcements) will be categorized as within the individual's control or understanding. Many personality theorists have emphasized the interaction of the individual and his environment (for example, Kantor, Lewin, Helson, Allport, Brunswik). Rotter points out that the fact that behavior varies from situation to situation is usually treated as a source of error and something to be avoided. He makes a case for the need to systematically vary both dispositional and situational kinds of variables
within the same investigation in order to increase our understanding of the determinants of behavior and prediction of it. Many fail . . . "to systematically differentiate behavior, reinforcement value, and expectancy as internal variables and to recognize that these variables are affected by the psychological situation" (Rotter, 1960, p. 314).

In social learning theory, the psychological situation operates by providing the person with cues which are related to his expectancies for reinforcement for different behaviors; that is, the situation presents cues which arouse experiences. Rotter presents studies by James (1957) and Moss (1958) as illustrations of varying both situational and internal characteristics. In both cases prediction was increased by considering the interaction of both.

It is important to note that both situations and individuals may be categorized according to whether or not reinforcements are perceived to be a function of Internal or External control. Individuals can characteristically perceive the occurrence of reinforcements as within or without their control, and situations can be perceived as determined by chance, luck or others as opposed to one's own skill and ability. As Rotter et al. (1962) explain, "the emphasis on the situation indicates that the I-E Control construct is not conceived as a typology whereby people can be dichotomously classified but as a hypothetical construct to account for intraindividual as well as interindividual response variations in specified situations." (p. 499)
In summary then, Locus of Control is theoretically defined as an expectancy construct, a generalized expectancy that one's own behavior or skills or internal characteristics do or do not determine the outcomes of the reinforcements that will occur.

Locus of Control Research Reviewed

A recent monograph by Rotter (1966) and a review by Lefcourt (1966) provide excellent summaries of the many studies that have employed I-E measures. These plus articles by Battle (1962) and Rotter et al. (1962) provide the background for the present review.

Rotter and his associates present the I-E Control variable as an important general behavioral variable, and they have demonstrated its relevance in many learning and decision-making situations. The stimulation for the I-E variable was said to stem mostly from learning studies and psychotherapy. The main concern of the learning studies involved discrepancies in performance and extinction. The question of therapeutic gain was also of concern. Does the patient change his behavior as a result of his new experiences or does he discount it by attributing it to others, chance, etc.?

Lefcourt divides I-E research into two main categories: I-E Control as determined by task structure and I-E Control as a personality variable. The former approach conceives of all subjects as both Internals and Externals depending on the external situation. Ex-
periments here concern environmental conditions that induce Internal versus External beliefs or expectancies and their effects on behavior. The second approach assumes subjects are Internals or Externals (a kind of typology). Here measuring instruments are developed and behavioral differences between the two types are studied. In Lefcourt's terms, the former approach involves experiments in which differences in task structure (the psychological situation) induce specific expectancies for Internal or External Control; the latter approach involves experiments with perceived control as a generalized expectancy.

This dichotomy appears to directly parallel the long-standing split in psychology between the personality-centered (social, clinical, individual) and traditional experimental approaches to theory and research. The relevance to the preceding discussion regarding the need to consider both dispositional and situational factors is obvious.

As one might expect, it is difficult to dichotomize all studies in this area as to whether they place greater emphasis on situational or personality elements. In general, most of the studies regarding specific expectancies for Internal versus External Control deal with complex learning under chance versus skill conditions. These studies will be reviewed first. Following this, the measures of generalized expectancies for Internal versus External Control and several studies covering a wide range of personality correlates will be reviewed.
under the heading "Internal-External Control as a Personality Variable." Finally, the studies which deal with I-E and social class and I-E and risk-taking will be presented in the sections called "Sociological Variables" and "Risk-Taking", respectively.

1. **Learning Studies**

The Locus of Control construct originated in social learning theory research as part of the investigation of skill and chance situations and how they affect expectancy learning. From the theoretical notion of I-E Control, several hypotheses were advanced and applied to the problems of acquisition and performance.

Experiments concerning behavioral differences in chance and skill situations began with Phares (1957). He used line- and color-matching tasks with a prearranged success and failure schedule, and he induced chance and skill conditions with instructions. It was found, as hypothesized, that the increments and decrements in expectancy following success and failure, respectively, were significantly greater under skill than chance instructions. Thus, when subjects perceived the task as determined by their own skill and efforts, they were more likely to rely on past experience as compared to subjects who perceived the task as one in which chance, luck, or experimenter control determines the reinforcements. The latter were less likely to raise their expectancies for future reinforcement.
following success or lower their expectancies after failure. Using line-and angle-matching tasks, James (1957) also showed that chance-instructed subjects were less likely to generalize success and failure experiences from one task to another than were skill-instructed subjects.

James and Rotter (1958) then demonstrated differences in the extinction of verbalized expectancies as a function of skill and chance instructions under partial 100% reinforcement. The usual superiority of partial reinforcement was found in the chance condition, but with skill instructions 100% reinforcement took longer to extinguish than 50% reinforcement. Rotter et al. (1961) confirmed these findings using "ESP" and motor tasks. They showed that past reinforcement is a clearer clue to future reinforcement when subjects believe that their own skill determines the outcome. To show that differences in extinction patterns would be the same with a behavioral (nonverbal) criterion, Holden and Rotter (1962) used betting on an ESP task and found that the "chance" and "no information" groups had almost twice as many trials to extinction as the "skill" group. Thus the studies by James (1957), Rotter et al. (1961), and Holden and Rotter (1962) support the results of James and Rotter (1958) using different tasks and different methods of measuring expectancies.

Using the Rotter et al. (1961) tasks rather than differential instructions, Bennion (1961) found that low variability of subjects'
scores over several sets of trials was a function of perceiving the trials as dependent on skill rather than chance reinforcement of responses. Finally, Phares (1962) conducted a study on perceptual thresholds for shock-associated nonsense syllables and found that thresholds lessened in the skill as compared to the chance condition.

As both Lefcourt and Rotter indicate in their reviews, these studies have important implications for learning paradigms in which reinforcement is controlled by the experimenter. Generalizing laws of learning from experimenter-controlled studies would seem to be dangerous. These studies on I-E and learning may be interpreted as indicating that "research in human learning should be understood . . . in light of the position on a continuum of internal to external control that the task and procedure will be perceived by the subjects." (Rotter, 1966, p. 25). The writer shares the opinion that research here has important implications for understanding human learning, the relationship of specific experimental designs to the results obtained, and important individual differences in personality. Its sociological implications will be dealt with in a later section.

2. Internal-External Control as a Personality Variable

   a. Measures of Internal-External Control

   In his study of skill versus chance effects on expectancies for reinforcement, Phares (1957) constructed a "chance versus self-
determination" scale to measure the personality correlate of this construct. This was the first attempt to measure individual differences in generalized expectancy or belief in External Control as a psychological variable. James (1957) promptly revised Phares' scale and was able to show that subjects' behavior was affected by both chance and skill cues and by a personality characteristic which was measured by the James-Phares scale. Thus, the differences which occurred as the result of situational conditions (chance versus skill) were also true of subjects within groups as a function of their general attitude toward control of reinforcement.

The measure was then broadened by Liverant, Rotter, and Seeman. They eliminated some of the response-set problems of the James-Phares scale by developing a forced-choice scale of I-E Control, which dealt with six categories of attitudes. The scale was later shortened, and because item analysis indicated that the subscales were not generating separate predictions, the six-way classification was abandoned. Liverant, Rotter, and Crowne completed the final version by doing such things as eliminating items which had a high correlation with the Marlowe-Crowne Social Desirability Scale. The items of the present scale deal exclusively with subjects' beliefs regarding the nature of the world, that is, how reinforcement is controlled. The scale is reasonably homogeneous, even though many different situations are covered. With homogeneous samples its
ability to discriminate individuals is limited; however it is quite suitable for studying group differences. Relationships with adjustment, social desirability, and intelligence are low and indicate good discriminant validity (Rotter, 1966).

To date three measures of I-E Control have been devised for children. Two of these were employed in the present study. They will be described in detail in a later section and only briefly discussed here. Proceeding from the James-Phares Scale, Bialer (1961) developed the "Children's Locus of Control Scale". This is a 23-item questionnaire which calls for 'yes-no' responses, for example, "Do you really believe a kid can be whatever he wants to be?" Cran dall et al. (1962) developed the Intellectual Achievement Responsibility scale, which deals exclusively with self-responsibility in intellectual and achievement situations. Finally, Battle (1962) developed the "Children's Picture Test of Internal-External Control", which is said to be more projective in nature. It presents six cartoons modeled on the Picture-Frustration Study (Rosenzweig, 1945) about which the child states or writes "what he would say" in the depicted life-like situations which involve attribution of responsibility (for example, "Why is she always hurting herself?").

In line with the multimethod measurement idea of Campbell and Fiske (1959), there have been non-questionnaire approaches to measuring I-E Control. Adams-Weber (1963) used a story-completion
("projective") test of the tendency to see punishment for moral transgression as being externally imposed versus the result of immoral behavior. The test was found to be significantly related to I-E Scale scores. In a study of academic failure, Cardi (1962) used a semi-structured interview to measure I-E Control. It correlated .61 (biserial correlation, p<002) with I-E Scale scores.

The success of a variety of techniques in measuring the I-E Control dimension provides support for its construct validity and argues against a response-style or response-set interpretation of the questionnaires (Lefcourt, 1966).

b. Personality Correlates

Not only do people differentiate learning situations as Internally or Externally determined, but individuals differ in generalized expectancy of how they perceive situations. It has been shown that such generalized expectancies can be measured and used to predict behavior in many situations. Most of the evidence comes from predicted differences in behavior for individuals above and below the median of the I-E Scale(s) and/or from correlations with behavioral criteria. Bialer (1961) studied Locus of Control along a developmental dimension and related it to the concept of success and failure. He found that with increasing mental age there was a significant trend among both retarded and normal children to perceive Internal Locus
of Control, respond to success-failure cues more than hedonic cues, and delay gratification. Bialer's idea was that as development proceeds, the child begins to notice that he is often able to influence the outcome of events by his own actions. This leads to viewing his goal-directed activities as consequences of his own behavior (that is, as Internally controlled), and this in turn is said to be a necessary precondition for categorizing events in terms of success and failure rather than pleasure and unpleasure. Actually, as Battle (1962) points out, there has not been much work on how Locus of Control develops in children. She suggests that both the association of event outcomes with behavior and the socialization process, in which the child comes to adopt the relevant concepts and attitudes from the significant adults in his environment, may be involved.

Several researchers have compared I-E scores with measures of other personality variables. Holden (1958) and Simmons (1959) both used the James-Phares scale and found relationships with the following measures: California F Scale (Externals tend to see the world as containing powerful forces to which they can only yield); Level of Aspiration Board (because he is unable to arrive at a stable evaluation of his own skill, the External is "failure avoidant", while the Internal is "success striving"); Edwards' Personal Preference Schedule (male Externals were defensive and failure avoidant, female Externals were passive and easy going); and Ohio State Psychological
Examination (female Externals tended to be poorly motivated in academic achievement situations). In a recent study with college students, Butterfield (1964) found Externals to be more intropunitive, less constructive, higher in debilitating anxiety, and lower in facilitating anxiety than Internals.

James (1957) found a significant curvilinear relationship between I-E and the Incomplete Sentence Blank, which measures the degree to which the individual anticipates failure or punishment in life and defends by maladjusted responses. The extreme External sees no chance to maximize or increase reinforcements, and the extreme Internal cannot attribute any failure to factors independent of himself. James thus found that extreme subjects tended to expect failure (high ISB scores) more than less extreme subjects.

James' finding regarding extremes of Internality and Externality raises the issue of pathological counterparts of these extremes. Perhaps depression and paranoia represent the extreme Internal and External, respectively; however, if one considers levels of psychological functioning, the issue becomes extremely complex. One interesting phenomenon, for example, is that some subjects reflect an Internal orientation on an attitude test but behave as an External in the face of failure on a performance task. Others give mostly External test responses and demonstrate Internal behavior. Some authors suggest that the "false Internal" (the Internal who behaves like an External)
may be exhibiting "defensive Externality". Thus, if an individual has a high "need value" for success and performance fails to elicit positive reinforcement, he might behave Externally to protect himself. The "false External" person may also be trying to protect himself from anticipated failure by behaving like an Internal. Thus, the paranoidal system may represent a well formulated "defensive Externality", and the sociopath may be the true extreme in Externality (Battle, 1962).

Several experiments to be reviewed in the next section deal with attempts to control one's environment, but those which are not primarily concerned with powerlessness or ethnic and class differences may be discussed at this time. Seeman and Evans (1962) found that Internal tuberculosis patients had considerably more knowledge about their condition and expressed more dissatisfaction at the lack of feedback from hospital staff than their matched pairs of External tuberculosis patients. In a similar study with reformatory inmates, Seeman (1963) found that Internals remembered more information regarding their parole and other important factors that would affect them after discharge. Gore and Rotter (1963) found that Negro college students who claimed to be willing to participate in civil rights activities were significantly more Internal than those mildly or not at all interested. Phares (1965) found that Internals were more successful at changing the attitudes of their peers regarding fraternities and sororities than
were Externals. In the area of personal control, Straits and Sechrest (1963) and James et al. (1965) have shown non-smokers and people able to quit smoking to be significantly more Internal than smokers and non-quitters.

Resistance to suggestion is another area of interest in relation to Locus of Control. Verbal conditioning studies by Strickland (1962) and Getter (1962) suggest that Internals are negative or resistant to external manipulation. A study by Gore (1962) helps to further clarify the relationship. She found that whereas there were no differences under overt suggestion, Internals did resist more when subjected to subtle suggestion by producing shorter TAT stories. Apparently Internals are not resistant when given a conscious (overt) choice; however, when they become aware of any attempt to subtly manipulate, they do resist. Exactly how the individual perceives the situation regarding his control of what happens to him appears to be the most important determinant of his behavior in this regard.

Studies in the area of person perception have shown that the I-E Scale is sensitive to prediction of others but insensitive to the cognition of one's own behavior. De Charms et al. (1965) found that Externals tended to perceive the heroes of stories as "Pawns" (externally constrained and unable to be the causal agent of their own behavior), and Internals tended to perceive the heroes as "Origins" (the causal agent of their own behavior). Two later studies were designed
to manipulate the Origin-Pawn variable by inducing in subjects a feeling of being an Origin or a Pawn. Kuperman (1967) found that the I-E Scale was not related to any of the Origin-Pawn measures; that is, I-E Control did not relate to subjects' own behavior when acting like an Origin or a Pawn. De Charms et al. (1966) hypothesized and found that the behavior of a subject who feels that he is an Origin is different from that of a subject who feels that he is a Pawn. Again, however, the I-E Scale failed to relate to subjects' own behavior.

There has been a considerable amount of investigation into the relationship between I-E and measures of intelligence. Lefcourt (1966) points out that little or no relationship has been found in studies where the range of intelligence is not extensive. Using a male college sample, Liverant and Scodel (1960) found no significant relationship between I-E and the Ohio State Psychological Examination ($r = -0.09$). In the Rotter, Simmons, and Holden studies discussed above, the positive relationship between the OSPE and Internality held only for females. The authors offered a motivation interpretation. Bright males are often under pressure to produce intellectually. They may defend against anticipated failure with a verbalized External orientation, even though they perform as Internals. Females, not being nearly as subject to the same cultural demands, show greater congruity between verbal and performance aspects of I-E.

Bialer found IQ differences in I-E, however his comparison was
between normal and retarded children. Cromwell's (1963) discussion of how retardation can eventuate in lower success expectancies with a concomitant decrease in efforts to achieve might help to explain these findings. Battle and Rotter (1963) actually found a reversal, with lower-class Negro children with high IQ's being more Externally oriented than middle-class white children with lower IQ's. Their interpretation was that when the capable, bright, lower-class, Negro child encounters failure due to his class and race he defends with an External attitude; the less bright, middle-class child may respond with self-blame when faced with his low ability. Battle (1962) points out that a large number of items on the Bialer questionnaire relate to success experiences and may thus account for the correlation between school achievement and Bialer scores. In designing the Children's Picture Test, Battle eliminated items that related to success. Analysis of her data indicate that intelligence (as measured by California Mental Maturity Test) bears no independent relationship to I-E.

The writer can only conclude that if intelligence is significantly related to I-E, it is not a simple linear relationship. Conceptually, it would appear that bright individuals could be either Internally or Externally oriented. The bright Internal might construe his intelligence as a means to maintain control; the bright External might be defending against his anxiety around failure and demands that he "look good". Intelligence will be controlled statistically in the present
The relationship between I-E and achievement motivation (McClelland et al., 1953) is similarly complex. It would seem that Internals would show more overt striving for achievement than Externals and that people with high achievement motivation would believe in their own ability or skill to determine the outcome of their efforts. Studies by Odell (1959) and Lichtman and Julian (1964) report correlations of -.25 and -.27, respectively, between achievement motivation and I-E Control. These correlations are small but in the expected direction, since the I-E Scale measures expectancy for External control. In addition to conceptual differences, the two dimensions are measured quite differently, and this probably adds to the lack of linear relationship.

Studies by Crandall et al. (1962) and Cellura (1963) demonstrated complex relationships between behavioral measures of achievement and the Intellectual Achievement Responsibility scale. Butterfield (1964) found that when he partialled mental age out of achievement scores, Locus of Control and achievement correlated -.89 (p<.01) in college students. However this relationship held only for those students whose achievement values differed from their professors. When achievement values were similar, there was no relationship between Locus of Control and achievement. It is interesting to note that Butterfield's Externals expected higher grades, actually received higher
grades, and had higher estimates of the grade for which they were willing to settle. Finally, Franklin (1963) studied high school students' expectancies about Internal versus External Control in relation to several developmental, attitudinal, and behavioral variables. He found that Internals had higher grades, were "better" students, were more ambitious and sure about vocational and educational plans, were more religious, and had mothers with more education than Externals.

Rotter summarizes the literature on I-E and its relationship to personality and behavioral differences as follows:

A series of studies provides strong support for the hypothesis that the individual who has a strong belief that he can control his own destiny is likely to (a) be more alert to those aspects of the environment which provide useful information for his future behavior; (b) take steps to improve his environmental conditions; (c) place greater value on skill or achievement reinforcements and be generally more concerned with his ability, particularly his failures; and (d) be resistive to subtle attempts to influence him. (Rotter, 1966, p. 25)

Sociological Variables

1. Social Stratification Among Negroes

Kahl (1957) reminds us that the ideal-type classes are "helpful abstractions", but they cannot be used without practical judgment. "They will help us order our thinking about the complexities of social reality, although they may encourage us to assume falsely that a community can be neatly divided with each family tagged and placed in its
Two questions must be discussed concerning the concept of social class in regard to the present study: 1) What is the nature of social stratification among the American Negro society, and 2) how can this be measured? The matter of measurement will be discussed in Chapter two. Our task here is to try to understand what is meant by social class—especially as it pertains to an urban, Negro community.

**Caste and Class:** Unlike other ethnic groups, Negroes have not been permitted to assimilate into the larger American society. Kornhauser (1953) says that this is largely due to the lack of opportunity for class mobility. Degree of mobility and acculturation are influenced by several factors such as size of group, length of time the group has been in America, initial socioeconomic status, etc.; however, in the case of the Negro, the factor which is most inhibiting is the extent to which he is different from the dominant (white middle-class) culture. "In addition to enforcing social inferiority, the case system [in the United States] systematically results in deprivation in the educational, occupational, and political realms for the Negro" (Kornhauser, p. 237). Studies by Drake and Cayton (1945) and Davis et al. (1941) illustrate the vast disadvantages heaped on Negroes in all areas of social, economic, and political life.

Within each caste classes exist, thus class mobility within castes is possible. There is controversy concerning the "caste line" between
Negroes and whites in the United States. Park (1950) explains that originally all whites were above Negroes, so the castes were separated by a horizontal line. Park claims that the caste line has shifted to vertical due to the development of occupational classes within the Negro caste. Kahl explains that the occupational distribution of Negroes and whites is not quite as Park would have us believe because Negroes are far behind in proportions of those who have climbed into upper positions in the urban world. That is, there are relatively few professionals, proprietors, craftsmen, etc. Instead Negroes are overrepresented in the service and labor categories.

Warner et al. (1960) maintain that the present caste line is diagonal. Whites still look down rather than across at Negroes, but things have changed to the extent that not all Negroes are considered inferior to all whites. Again the studies of Chicago ("Black Metropolis") and deep south ("Old City") help to explain both sides. On the one hand, by restricting opportunities for Negroes, the caste system forces the majority of Negroes to remain in the lower class. Thus the Negro middle and upper classes are considerably smaller proportionally than the white middle and upper classes. On the other hand, enlargement of opportunities (especially in the North) has led to the development of a class system that more closely resembles that of the whites.

Middle and Low Class Negroes: In many ways, people of the same class but different caste are more alike than those of the same
caste but different class (Kornhauser, p. 239). This is not to say that effects of limited opportunities are not crucial. The Drake and Cayton, Davis et al., and Davis and Havinghurst (1948) studies demonstrate how these are reflected in the standards of the Negro class structure. The first two are analyses of Negro society in Chicago and in the South respectively, and the third is a study of child-rearing practices of middle and lower-class Negro and white parents in Chicago. These studies shall supply the background for a description of middle and lower-class Negroes.

With respect to child-rearing, middle-class children are trained to assume certain kinds of responsibility at an earlier age than lower-class children. Whereas middle-class children are expected to help in household chores and care for younger siblings, lower-class children are expected to get jobs (and often quit school) at an earlier age. In general, middle-class children are trained earlier for achievement (higher educational and occupational status); lower-class children are trained to "pay off". Davis and Havinghurst tell us that these differences were true of both Negro and white groups, and they emphasize the similarities between classes.

Drake and Cayton found that the Negro middle-class is quite similar to the white lower-middle class. Middle-class Negroes were characterized as having an intense desire for moral responsibility and accepting the values of striving and "getting ahead". Life to them is
stable and orderly in comparison to the lower-class Negroes who have unstable family patterns. The lower-class children are often fatherless and grow up with little supervision. High rates of delinquency and disease are common.

What becomes obvious in regard to the above descriptions is that social class distinctions are in essence value distinctions. How much money one earns, the size of one's house, occupation, education, etc. may be correlates of social class, but they are not necessarily determinants of class values. The goal of the present study was not to compare rich versus poor or highly educated versus poorly educated with respect to their risk-taking behavior. It was, rather, to compare subjects whose families have adopted "middle-class values" with those who live and function according to "lower-class values". Although this may best be measured by some of the above-mentioned correlates, this will be true only to the extent that values manifest themselves in these ways.

One of the most interesting types of families are those which have middle-class values but are lower-class in terms of the indices. These families are sometimes referred to as "transitional" or "upward striving". They are middle-class in terms of anticipatory socialization, but not necessarily in terms of income or education. These people want good jobs and homes but have trouble getting them. In Bronzeville (Black metropolis) they were called "strivers" and
"strainers". They struggle to maintain a way of life that is extremely difficult in terms of their limited income and limited hopes for future advancement. One might say that these people have adopted white middle-class values even though they are denied white middle-class opportunities.

2. **Powerlessness and Alienation**

In his general review, Rotter argues that the most important kind of data to assess the construct validity of the I-E Control dimension involves people's attempts to better their life conditions, that is to control their environment in important life situations. He points out that in this sense the I-E construct appears to measure the psychological equivalent of the sociological concept of alienation in the sense of powerlessness.

The idea of alienation is very prominent in sociological literature. Its several variants or components include powerlessness, meaningless, anomie, normlessness, social isolation, and self-estrangement. The studies related to I-E in this area deal mainly with subjects' sense of powerlessness, or "the individual's low expectancy that his own behavior can determine the occurrence of the goals or rewards he seeks" (Seeman, 1963, p. 270). Thus, like the I-E notion, powerlessness focuses on the individual's self-perceived control of his fate. In addition to affecting his social learning, powerlessness is thought
to relate to one's social circumstances such as class and ethnic status. There are many classical works and interesting studies in this area. A few examples will suffice before moving on to studies directly concerned with Locus of Control.

A common theme in many of these writings is that when culturally prescribed goals are seen as incongruent with the available means, the result is some kind of deviant or inappropriate behavior. Lefcourt and Ladwig (1966) feel that this kind of condition leads to normlessness or "a high expectancy that socially unapproved behaviors are required to achieve certain goals" (p. 153). Similarly, Seeman (1963) points out that bureaucratic, specialized, and/or isolated people become convinced of their own powerlessness. They turn their attention away from control-related learning and thus become apathetic, ignorant, and/or volatile. Fromm (1953) described powerless and alienated people as seeking mastery through faith in idealized, powerful leaders or through fate. Bettelheim (1952) found that prisoners and concentration camp victims adapted to the lack of opportunity to pursue their own values and goals by becoming very passive, irresponsible, and childish. Merton (1957) discusses the relationship between "anomie" and the development of ideologies which explain failure in terms of fate, luck, or chance.
3. **Social Class, Ethnic Group, and I-E**

Many of these works plus common sense suggest the hypothesis that people's social circumstances affect their social learning. Crucial to the present study is Battle's main point that variables such as social class and ethnic group are non-individual attributes which operate in the same way as situations. Thus, they should serve as a source of prediction of how particular individuals or groups will respond in a given situation (Battle, 1962, p. 9).

In a section of the *American Class Structure* in which he discusses lower-class apathy, Kahl writes "the lower-class persons themselves react to their economic situation and to their degradation in the eyes of respectable people by becoming fatalistic: they feel that they are down and out, and that there is no point in trying to improve, for the odds are all against them" (p. 211). Similarly, Battle comments about "life chances" for the individual within a given cultural milieu. The possibilities open to one on the basis of age, sex, race, socioeconomic status, nationality, education, religion, etc., are built up into a meaningful context only in the socialization process, which is directed toward clarifying and perpetuating certain attitudes, behaviors, and roles.

Class and ethnic group factors operate as constraining forces on individual freedom, so that lower-class and minority-group children gradually come to recognize that success and failure are predetermined
(that is, reinforcements are externally controlled). The middle-class youth learns that achievement is the prime value of his class and that he is the main determinant of the limits. Studies by Hollingshead (1949) and Strodtbeck (1958) illustrate the impact of social class on the individual's life chances. In his treatise, *Elmtown's Youth*, Hollingshead describes lower-class people as giving the impression of being resigned to "a life of frustration and defeat in a community that despises them for their disregard of morals, lack of 'success' goals, and dire poverty" (pp. 110-111).

Strodtbeck developed a scale to measure "mastery". He was able to distinguish Jewish from Italian subjects, but most of the variance was attributable to social class. The two items which were most successful in differentiating are quite similar to the I-E items. They were: "Planning only makes a person unhappy, since your plans hardly work out anyway" and "When a man is born, the success he is going to have is already in the cards, so he might as well accept it and not fight against it". Strodtbeck's work thus provides some support for the notion that social-class might be an important determinant of I-E attitudes.

There have been several studies concerned with the prediction of Externality in known ethnic groups. Rotter (1966) and Gore and Rotter (1963) found no significant class differences among Ohio State psychology students and among Negro students at a southern college.
As they point out, however, these groups were extremely homogeneous. Studies with younger and non-college samples usually do indicate significant differences. Franklin (1963) reported a significant relationship between higher socio-economic status and Internality in a national stratified sample of 1,000 cases. Graves (1961) adopted the I-E Scale for high school students and studied a tri-ethnic community. He found Indians to be more External, Spanish-Americans second in Externality, and whites least External.

In an attempt to relate I-E to several sociological and demographic variables, Battle (1962) studied both Negro and white middle- and lower-class sixth and eighth grade children. She used the Bialer questionnaire, Children's Picture Test (which she developed for this study), and three behavioral learning measures of I-E Control. The most interesting finding was an interaction between ethnic group and social class. Lower-class Negro children were more External on the CPT than lower-class whites or than middle-class Negroes and whites. Also, the Externals reported lower mean expectancies for success on a line-matching task. Similarly, Bialer found that Externals showed a greater number of unusual shifts made in expectancy statements (raised expectancy after failure and lowered expectancy after success) in line-matching.

Since Battle's study is so pertinent to the present study, explanation of her results should be considered. Lower-class subjects
constantly perceive the real (objective) limitations of their position. One would expect them to be more Externally-oriented than the "more favored" middle-and upper-class children whose world contains more room for self-direction. In social learning theory terms, because lower-class subjects are deprived of opportunities, they come to perceive reinforcements as unobtainable through conventional channels (Lefcourt, 1965). Statistical analysis of Battle's data isolated the effect of social class as the most salient variable studied, including age, sex, ethnic group, and IQ. Not only did the Children's Picture Test yield the above results, but on the Bialer questionnaire there was a significant relationship between Internality and higher socio-economic status (r pt. bis. = .53, p<.01). Battle and Rotter feel that this interaction between ethnic group and class suggests that middle-class Negroes are raised to accept the white society's cultural beliefs regarding responsibility and opportunity. Thus they write "one antecedent of a generalized expectancy that one can control his own destiny is the perception of the opportunity to obtain the material rewards offered in a culture" (p. 488), and they also suggest that direct teaching of Internal and External attitudes may be involved.

Using the argument that racial segregation and discrimination means to Negroes that their efforts will not lead to reinforcements without "adventitious circumstances", Lefcourt and Ladwig (1965a) successfully predicted that Negro prison inmates would have higher
External expectancies than white inmates. Most of the subjects came from lower-class backgrounds and were of average intelligence. The authors employed three questionnaire measures (I-E, Powerlessness, and Normlessness) and three behavioral measures (from level of aspiration board), and the Negro group came out more External on all six.

A further study by Lefcourt and Ladwig (1965b) investigated the important issue of expectancy alteration. Negro inmates, who had previously been characterized as highly External, were led to believe that they were being studied as jazz musicians. They played a biracial competitive game with white stooges who continuously won. Instead of showing avoidance behavior, the experimental subjects persisted longer than the two control groups of Negro inmates. This was interpreted as a function of the musician's higher expectancies of being able to gain reinforcements for their efforts. Thus, Negroes (and by inference lower-class subjects) may become more task- and achievement-oriented when they expect that their behavior can determine valued reinforcements. The fact that Negroes usually perform less adequately than whites on intellectual and achievement measures may reflect the fact that middle-class goals are often unavailable to them. Consequently, such goals may take on a negative reinforcement value as well as low expectancies for success. This has a great deal of relevance to the studies mentioned earlier which showed Negroes to
be more anxious, unproductive, and less intelligent (for example Katz et al., 1964). In fact, Roen (1960) suggests that Negroes incorporate intellectually defeating personality traits (analogous to an External orientation).

Summarizing the ethnic studies, Lefcourt (1966) writes:

... groups whose social position is one of minimal power either by class or race tend to score higher in the external control direction. Within the racial groupings, class interacts so that the double handicap of lower-class and "lower-caste" seems to produce persons with the highest expectancy of External control. Perhaps the apathy and what is often described as lower-class lack of motivation to achieve may be explained as a result of the disbelief that effort pays off (p. 212).

Thus we have found a considerable amount of evidence which suggests that social class and ethnic group affect social learning and hence the expectancy or belief in Internal versus External Control.

Lefcourt (1966) concludes his review with the following plea for future research:

Despite the leads from these research reports, little has been reported on how Internal- or External-control expectancies become generalized across differing situations. ... the breakdown of External-control expectancies assumes more than a theoretical interest when programs are currently being devised by governmental agencies seeking to ameliorate problems of poverty and racial barriers, the very problems which seem to generate External-control orientations and their concomitants of apathy and lack of goal-striving behavior (p. 218).
Risk-Taking

The variable called "risk-taking" is a measure of decision-making strategies and/or behaviors under conditions of risk. Individual behavior in such situations is a highly complex thing. Many studies have involved risk-taking as a dependent variable and attempted to find personality correlates. Some of these will be mentioned before the more pertinent work on risk-taking and I-E control is presented.

Using a formalistic approach, Edwards performed a series of experiments on betting strategies (1953, 1954a, 1954b). He found that both preferences for bets with higher expected values (probability times amount) and preferences among probabilities influence subjects' choices. Even when there are objective reasons to prefer one bet to another, probability preferences are important in determining decisions among bets. Scodel et al. (1959) make the point that formal models of decision-making are notoriously poor in predicting how individuals actually behave in risk-taking situations. The authors claim that such models ignore personality variables in favor of normative notions like maximization of expected utility.

The personality-centered approach focuses on the motivational determinants and empirical correlations of risk-taking (for example, Atkinson, 1958; McClelland, 1958; Kogan and Wallach, 1964; Scodel et al., 1959). Slovic (1964) points out that risk-taking propensities have been hypothesized to be important determinants of many things,
such as problem-solving ability, creativity, accidents, vocational choice, entrepreneurship, and criminality (p. 220). He raises the question as to whether risk-taking is a general personality disposition predicting behavior across situations, or instead a multidimensional concept (which would not hold across different situations).

1. Risk-Taking and Achievement Motivation

The original impetus for studying risk-taking with respect to achievement motivation stems from the interest of McClelland et al. (1953) in the entrepreneur. In addition to liking immediate feedback and taking responsibility for his actions, the person with high achievement motivation (n ach) is characterized as someone who is willing to take moderate (calculated) risks and shies away from extremely safe or extremely speculative risks.

Atkinson (1957, 1958) and Atkinson et al. (1960) have presented a theoretical model to explain how "hope of success" and "fear of failure" motives (as measured by TAT Need for Achievement and Test Anxiety Questionnaire, respectively) influence risk-taking and level of performance in achievement situations. Atkinson predicts that if motivation to approach success (Ms) is stronger than motivation to avoid failure (Maf), then moderate risks will be preferred; if Maf is stronger than Ms, then extremely high or low risks are preferred. Both of these motives are said to be most intense at the .50 subjective proba-
bility level, that is, the task of intermediate difficulty. This is the point at which the person with high _n_ ach likes to test his skill and the person with low _n_ ach wants to avoid the challenge.

Support for the moderate risk hypothesis came from studies by Litwin (1958), Atkinson et al. (1960), Atkinson and Litwin (1960), de Charms and Davé (1965), Raynor and Smith (1966) and others. Typically, a game such as an imaginary horse race, preferences between imaginary bets, ring toss, shuffleboard, paper and pencil puzzles, and the like are used to demonstrate the high _n_ ach's preference for moderate risk and the low _n_ ach's preference for extreme risk. Carpenter (1967) demonstrated this using arithmetic and spelling tasks. Experiments generally support the theory; however, the tendency for the .50 group to experience the greatest achievement motivation is "fragile".

Although Atkinson's model was only intended for situations in which success is based on the individual's skill or effort, many researchers have applied it to a wide variety of risk-taking situations. An interesting finding, and one which is of concern to the present study is that Atkinson's model seems to run into some difficulty when applied to chance-determined situations. Atkinson et al. (1960) pointed out that games of chance should not interest the person with high _n_ ach because he cannot feel personally responsible. The intermediate risk hypothesis was supported with college males in both shuffleboard
(skill) and preferences among imaginary bets (chance), but the differences were due only to the "low need achievers" preferring extreme risks and not to the "high need achievers" taking intermediate risks. The "lows" failed to discriminate between skill and chance because the outcome seemed beyond their control even in the skill situation.

Littig (1963) also examined Atkinson's model in a chance situation (poker-dice game). He hypothesized that 1. Ms>Maf subjects would prefer a probability of success (Ps) of .50 in a game of chance, and 2. Maf>Ms subjects would avoid the same. Hypothesis 1. was not supported, but as the experiment progressed the Ms>Maf group developed a preference for higher Ps bets, that is they tried to "exert some control over the outcome of the game by obtaining, through their bids, those objective probabilities which most insure winning . . . " (p. 426). Thus when these subjects found themselves in a situation in which they could not control or influence the outcome by their skill, they preferred to minimize risk and take more conservative bets. Hypothesis 2. was supported, but with time the Maf>Ms subjects became indifferent to the various probabilities. Littig concludes that the Ms and Maf motives are not as situationally dependent for their arousal as Atkinson suggests, since a minimal achievement situation (game of chance - no standard of excellence) was sufficient to arouse them. The main point for our purpose is that when motives were aroused in "less than ideal achievement related situations", they lead to behavior that was
not predicted by the model when $M_a > M_f$. In his discussion Littig emphasizes the incentive component of the model, which represents the reward value of successful achievements that is inherent in the situation.

Using a similar population of college males, Raynor and Smith (1966) found that both direct and projective measures of achievement-related motives related to preference for intermediate risk in paper and pencil puzzles (skill) but not in betting preferences (chance). The authors point out that the model suggests why risk-taking is different in these conditions. Skill games provide achievement incentives, while chance games do not. Thus individual differences in the strength of achievement motivation should be irrelevant in bet preferences, especially if the subject knows that the outcome is entirely chance-determined. "There are, of course, games in which the individual may believe that success depends upon some combination of skill and chance [and here] a moderate relationship between achievement-related motives and preferences for intermediate risk might be expected!" (p. 194).

With regard to some of the above studies, one might wonder whether high need for achievement must be accompanied by an expectancy for Internal control in order for moderate risk-taking to be demonstrated. The idea of personal responsibility is said to be involved in both the high need achiever and the Internally oriented
individual. Scodel et al. (1959) gave an opinion questionnaire to college and military subjects, which was characterized by attitudes of fatalism and resignation at one end and by belief in one's own capacity as a way of influencing reality at the other. Results with a dice game were only partially consistent with Atkinson's model. Only one of the thirty items discriminated high versus low payoff bettors at the .05 level. High payoff bettors took risky bets, but they were lower on fear of failure than low payoff bettors. The latter subjects were said to take moderate to cautious risks (intermediate to high Ps bets) because of stronger internalization of middle-class values.

2. Risk-Taking, Intelligence, and Personality Correlates

Before considering the literature that bears more directly on the relationship between I-E and risk-taking, a word should be mentioned about intellectual and other personality factors. Scodel et al. (1959) found no significant correlation between Wechsler vocabulary scores and risk-taking in a gambling situation with a heterogeneous group; however, there was a significant inverse relationship between verbal aptitude and variability in risk-taking. The authors suggested that intelligence may mediate the relationship between I-E and selection of betting strategies. In this regard the less intelligent subjects depended on previous outcomes, while the more intelligent subjects depended on the formation of stable betting strategies. In a later study with a homogeneous college group, Liverant and Scodel (1960) found
intelligence per se was not significantly related to any of three risk-taking measures employed. There was a slight tendency for intelligent subjects to be less variable in their risk-taking behavior (p. 27).

The common sense view is that brighter people would tend toward optimal decision making. Kogan and Wallach (1964) argued that each item about which the individual is uncertain becomes a decision making situation, so verbal aptitude may be determined in part by risk-taking dispositions. These authors used manifest anxiety and defensiveness as moderator variables to study the relationship between risk-taking and several personality dimensions. Among the many complex relationships they found were interesting differences between skill and chance situations. Males who were low anxious-high defensive and "self-sufficient" behaved conservatively in the skill situation and risky in the chance situation. In general, highly anxious and defensive subjects generalized their risky or conservative outlook across tasks, while low anxious and low defensive subjects responded differently to chance versus skill situations.

3. Risk-Taking and I-E

In his description of the I-E construct, Rotter (1966) states the following regarding chance and skill situations:

Generalized expectances [regarding behavior-outcome sequences] in combination with specific expectancies act to determine choice behavior along with the value of potential reinforcement. These generalized expectancies will result
in characteristic differences in behavior in a situation culturally categorized as chance determined versus skill determined, and they may act to produce individual differences within a specific condition (p. 2).

We have already examined the earliest I-E studies which demonstrated that the behavior of Externals differed from that of Internals in the same way that the overall population differed under chance as compared with skill instructions (Phares, 1957; James, 1957; James and Rotter, 1958). Rotter (1966) states "The behavior most susceptible to individual prediction is that which deals most directly with risk-taking and expectancies of the real influences of luck as demonstrated by belief in the gambler's fallacy" (p. 19). One of the most consistent findings of the above studies was that Externals tended to produce more unusual shifts than Internals; that is, Externals behaved according to the gambler's fallacy more than Internals.

It was Liverant and Scodel (1960) who studied Internal and External control as determinants of actual risk-taking behavior. They wanted to emphasize the importance of personality variables in decision-making. They used the I-E Scale and bet preference in dice-throwing, in which all possible bets had an expected value of zero,¹ and subjects knew all objective probabilities regarding outcomes. The

¹This means that all bets payoff in complete accord with objective probabilities. Thus, no particular selection of bets can minimize expected value.
question was, on what basis do subjects select among the bets? The authors hypothesized that since Internals believe they can exert some control - even in situations where chance governs outcome - they would tend to assure themselves of this control by selecting bets in a cautious and planned manner. On the other hand, Externals view outcomes as occurring randomly, so they should tend to ignore objective probabilities and select bets on the basis of hunches or outcomes of previous trials (that is, the gambler's fallacy). Specific hypotheses were: (1) Internals would select a greater number of higher probability-low payoff bets than Externals, and (2) Internals would be less variable in their choices of bets than Externals. Actually, Internals chose significantly more bets of intermediate probability and fewer low probability bets than Externals. More Internals never selected extreme high or low probability bets, and Internals wagered more money on cautious than on risky bets as compared with Externals. In the authors' words, "As a function of their disbelief in luck I's select more of the alternatives which, on an objective basis, should occur more frequently even though their objectively greater occurrence is offset by their association with a proportionally smaller payoff" (p. 65). The chance-oriented External played more "long shots", while the Internal had little confidence in the occurrence of these low probability-high payoff bets. Interesting, Internals did not choose the highest probability bet of all (p=2/3). Liverant and Scodel interpreted this in
terms of small payoff or lack of challenge. If something will occur very often on the basis of chance alone, then there is very little perceived reward. This sounds quite similar to Atkinson's explanation of high need achievers' preference for intermediate probability.

The main results of Liverant and Scodel's study, however, are the most important consideration for the present study. These authors succeeded in demonstrating that perceived control can differentiate behavior in a chance risk-taking situation. Internals seem to re-categorize the situation into one involving some elements of skill and behave accordingly. Using a skill task, Lichtman and Julian (1964) studied strategy preferences regarding estimation of dart throwing. Conditional probabilities of success were equated for two different distances, although subjects differed in the degree of actual control they could exert over the outcome. The results paralleled the Liverant and Scodel results where Internals preferred high p choices through which to maximize success. Here the Internals chose the closer of the two distances and Externals preferred the farther one at a rate of four to one.

Rotter and Mulry (1965) used chance and skill instructions regarding an extremely difficult angle-matching task and measured decision time. Internals took longer to decide on a matching standard under skill conditions than Externals, but shorter under chance conditions. This was said to show that Internals were more involved in the
Lefcourt (1965) set out to show that this phenomenon would be reversed under chance conditions. He mentioned Littig's (1963) hypothesis that people with a strong motive to avoid failure are more likely to become involved in a game of chance than those who are strongly motivated to succeed. In social learning theory terms, people who have a low expectancy that participation in skill situations leads to success should become more involved in nonskill (chance) situations. This is because the latter may provide alternative modes for securing reinforcements (like money) when skill-demanding situations (like work) are perceived as improbably avenues to success. Using the same gambling game as Liverant and Scodel, Lefcourt found that Negro inmates showed more Internal behavior than white inmates of similar social class and intelligence. This was reflected in the Negroes' more cautious selection of bets, with less variability (fewer shifts) and more frequent choice of high p bets. Thus the Negroes' perception that success in conventional tasks is controlled by forces other than their own efforts was reversed in a game of chance. In Lefcourt's words,

In motivational terms the Negro seems more highly motivated to avoid failure in skill situations and more motivated to achieve success in chance situations. This has been interpreted in a social learning framework as follows: through segregation and discrimination practices, Negroes have developed low expectations that reinforcements available and valued in our culture can be gained through socially prescribed means. That, in the schoolroom, marketplace, or jdb, work or effort will rarely lead to valued goals such as social recognition, financial comfort and security, protection from malevolent community forces, etc. Consequently, many Negroes
skill situation and that they value reinforcements for skill more than chance. Thus, whereas Liverant and Scodel demonstrated differences between Internals and Externals in a chance situation, here Internals differed under chance and skill conditions more than Externals did.

Battle and Rotter (1963) found a significant relationship between the Bialer I-E questionnaire and number of unusual shifts on a line-matching task \( r = -0.47, p<0.01 \). Internals shifted unusually less often than Externals. Carpenter (1967) found the Bialer unable to predict the spelling and arithmetic risk-taking behavior of culturally deprived fifth and seventh grade Negro children. In regard to this negative finding, Kogan and Wallach (1964) point out that the failure to find significant relationships between I-E scales and risk-taking behavior does not invalidate the scales because they were not constructed for the purpose of predicting risk-taking.

If significant relationships between I-E and risk-taking are obtained in the present study, we shall have learned more about risk-taking and about the scales. Thus our study may be considered an exercise in construct validity (Cronbach and Meehl, 1955).

4. **Risk-Taking, I-E, and Sociological Variables**

The writer was unable to find studies bearing directly on the relationship of risk-taking to class differences; however, several studies provide data suggestive of such a relationship. Scodel et al. (1959),
have developed less acceptable but relatively more risky methods for gaining certain goals (p. 769).

This explanation has been used to account for what Frazier (1962) calls the American Negroes' tendency to gamble obsessively. It might also help explain some of the above-mentioned differences between whites versus Negroes and lower- versus middle-class people's performance on intellectual and achievement tasks.
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CHAPTER 2

THE STUDY

The Problem

We have seen that the I-E Control construct involves both generalized and specific expectancies regarding the causal nature of behavior-outcome sequences. In Rotter's theory it is considered a generalized expectancy operating across a large number of situations, which relates to whether or not the individual believes he possesses or lacks the power over what happens to him. Regarding specific expectancies, Rotter (1966) writes, "From social Learning Theory one would anticipate that the more clearly and uniformly a situation is labelled as skill or luck-determined, in a given culture, the lesser the role such a generalized expectancy would play in determining individual differences in behavior" (p. 2). In line with this we have seen that previous research has shown that the growth and extinction of expectancies for reward definitely do vary considerably in different tasks depending upon whether they are perceived by subjects as chance, luck, or experimenter controlled-as opposed to those seen as determined by skill, with reinforcement depending upon the person's ability.

Regarding the generalized expectancy for I-E Control, the research
has also shown that subjects do differ in a stable personality characteristic of whether they expect reinforcements in a large variety of situations to be a function of external forces or internal attributes. Although Rotter et al. (1962) remind us that the I-E construct is not a typology whereby subjects can be dichotomously classified, they go on to state that the results with the I-E Scale suggest that "the variable is sufficiently stable and general to be considered an important personality characteristic" (p. 501). One of the main questions being asked in the present study concerns whether or not this generalized expectancy for Internal versus External Control is sufficiently stable and general in Negro boys to influence their behavior across situations. Will knowledge of subjects' belief in Internal versus External Control add to our ability to predict their risk-taking behavior in chance versus skill situations, or will the specific expectancies regarding the situations account for most of the variance?

On the basis of the literature cited earlier, the writer feels that the generalized expectancy or belief in Internal versus External Control may have important motivational characteristics and might be used to predict behavior on tasks in which motivational factors should account for a large portion of the variance. The tasks in mind are clearly defined, both culturally and via instructions, as chance- and skill-determined, and subjects are required to make decisions which yield several risk-taking measures. Thus, the study may also be viewed as
testing the motivational predispositions toward risky and conservative behavior versus the idiosyncratic situational factors of chance and skill. The writer is curious as to whether or not subjects will tend toward risk or caution consistently across both chance and skill situations. Liverant and Scodel found this to be the case in a gambling (chance) game, but no skill condition was employed. The generalized expectancy for Internal and External Control did, however, hold up against the situational pull of a game of chance.

Alienation and powerlessness have also been discussed both as a function of the situation and as a characteristic of the individual or group. Lefcourt has argued that Negroes behave more Externally than whites in skill situations because they do not believe they can control the outcomes of their behavior, and they behave more Internally in chance-determined situations because they see success more controllable here. Although Liverant and Scodel found that even in a chance situation Internals tried to maximize success by planned and cautious strategies, Lefcourt found that Negroes (who have been shown to be more External) acted the same way as Liverant and Scodel's Internals in the same chance situation. Liverant and Scodel's subjects were middle-class and Lefcourt's subjects were lower-class. Lefcourt assumed that his Negro group would have behaved more Externally than the white group in a skill-determined situation, however he did not test this hypothesis with his subjects. Neither did he present
any data on the I-E scores for his subjects. If his Negro group were in fact significantly higher in Externality and if they would have behaved more Externally in a skill situation, then Lefcourt's results taken together with those of Liverant and Scodel present an interesting paradox.

Since social class has been shown to operate similarly to - yet to be an even more powerful variable than race, let us re-examine Liverant and Scodel's and Lefcourt's studies from the viewpoint of lower- and middle-class subjects rather than Negro and white. What predictions could be made by inference if we substituted middle for white and low for Negro? We might assume that in the skill situation, lower-class subjects would take greater risks than middle-class subjects. In the chance condition, however, would lower-class subjects behave like Liverant and Scodel's Externals and be less conservative, or would they act like Lefcourt's Negroes and assume a more conservative strategy? Similarly, we might assume that middle-class subjects would act more conservatively than lower-class subjects in the skill condition; but in the chance condition would they behave like Liverant and Scodel's Internals and take a more conservative strategy, or would they act like Lefcourt's whites and take greater risks?

These questions cannot be answered by the two studies under consideration for the following reasons: (1) Liverant and Scodel used only white, middle-class subjects (no class or race comparisons);
(2) Lefcourt used white and Negro lower-class subjects and did not administer the I-E Scale (no class or I-E comparisons); and (3) Neither of the studies employed a skill condition (no situational comparison). For these reasons the above assumptions and hypothetical questions are purely speculative. There has been no study which examined Locus of Control, social class, ethnic group, and risk-taking in both chance and skill situations simultaneously. The present study is an attempt to answer some of these questions by exploring the effects of Locus of Control and social class on both chance and skill risk-taking situations. The effects of race, age, and sex will not be considered.

Variables and their Measures

1. **Locus of Control**

Rotter (1966) states that behavior in complex social situations is not a question of absolute judgments (agree - disagree), but a relative matter of deciding preferences. In their earlier writing about the I-E Control variable, Rotter et al. (1962) wrote

The degree to which the perception of control in a given situation is below the level of conceptual awareness (that is subconscious) is of paramount importance. Investigation of the relationship between paper and pencil measures of the control construct and projective measures may yield some fruitful insights into this problem (p. 512).

With the exception of the Battle and Rotter (1963) experiment,
all of the studies cited above which used I-E measures were based upon scores obtained from self-report, forced-choice questionnaire measures. The writer thought it would be interesting to know how a more indirect ("projective") measure of the construct would relate to social class and risk-taking behavior; thus, both the Bialer Scale and the Children's Picture Test of I-E Control were used in the present study.

a. Bialer's "Children's Locus of Control Test"

Using the 60 item James-Phares Scale as a model, Bialer (1961) reworded 38 of the items so that they could be individually administered with a "yes" or "no" response to children of various intellectual levels. A measure of internal consistency yielded 28 items whose correlations with the total scores ranged from .28 to .64. Split-half reliability increased from .76 to .86 with the Spearman-Brown correction factor. The final version contains 23 items (see Appendix A). Each item felt to reflect Internality receives one point so that a high total score indicates an Internal Locus of Control. "Internals" are defined as subjects who receive scores above the median; "Externals are those whose scores are below the median.

- The questionnaire presents specific questions regarding the nature of behavior-outcome sequences and requires the subject to say whether he believes them to be true or mostly true versus false or mostly false. The questions are of the "What can you do?" type. In
other words, they ask the subject whether he believes he can and/or does control various situations; for example, "Can you do anything about what is going to happen tomorrow?" Thus, the questionnaire is said to measure where the subject believes the Locus of Control to be.

The main point in relation to the present study is that this test is a forced-choice, "yes" - "no", self-report questionnaire, and as such it is subject to all of the limitations of a respondent (or "discriminated operant") type of test. Self-reports are notoriously unreliable for several reasons, including their inability to tap unconscious levels and their vulnerability to intentional faking and acquiescence response sets (Murnstein, 1963). The subject is restricted by both the stimuli and the manner of response. None of his responses may reflect his spontaneous reactions to the stimuli. It is possible that the Bialer really measures a kind of responsiveness to external criteria for Locus of Control in contrast to more internalized standards. Paralleling Raynor and Smith (1966) and de Charms et al. (1955), maybe children are taught to value Internal Locus of Control, and they consciously recognize and report this on the questionnaire.

b. Battle's "Children's Picture Test of Internal-External Control" (CPT)

In order to develop what she called a more "projective" measure of the I-E Control attitude to be used with children, Battle (1962)
developed 40 cartoon-like situations on the basis of the theoretical notion of I-E Control. These were balanced to include equal numbers of success and failure experiences, interactions of subjects of different ages and sexes, and content categories. The child is asked to tell or write what he would say if he were in each situation. Twenty-nine items were eliminated due to "item pull" toward I or E. The final six cartoons were chosen on the basis of their reliabilities (correlation with total score minus that item -- see Appendix B).

Responses are scored along a 7-point scale with three degrees of Internality, three of Externality, and a non-discriminatory midpoint. The possible range of scores is thus zero to 36, the higher score representing the more External orientation. "Externals" are defined as subjects who receive scores above the median; "Internals" are below the median. Scoring reliability was established with a sample of 40 protocols. The result was a correlation of .93 (p < .001). The scoring manual (see Appendix C) contains descriptions of each category as well as specific examples for each cartoon. Battle reports that intelligence, as measured by the California Test of Mental Maturity, did not relate significantly to CPT scores when socio-economic status and race were undifferentiated (r = .01 for all Subjects; r = .15 for males).

The CPT is not a true projective technique because the subject is asked specifically to state what he would say. This is "projective" only in that the subject "projects" himself into the stimulus situation;
however, it is not necessarily projective in the sense of unconsciously attributing one's own impulses to external objects. The main factor here, however, is that the CPT is more of an operant measure in which responses are more freely emitted and less restricted as compared with the questionnaire approach. Instead of directly asking the subject where he believes the Locus of Control to be, here he is asked to respond to situations which involve Internal and External control in a somewhat more subtle way. For example, one of the stimuli is, "Whenever you're involved something goes wrong!". The subject may be fully aware of his attitudes concerning the situation, but he does not realize his responses are scored for Locus of Control, that is, according to where he attributes success - failure, reward - punishment, etc.

By providing these little role-playing situations with considerable freedom of response, Battle expected that the cartoons would evoke the same type of attitudes as the more formal questionnaire, while stimulating greater interest and permitting a wider range of individual expression. Battle and Rotter (1963) found a significant relationship between the CPT and the Bialer \( r^2 = -.42, p < .01 \) with a group of 40 Negro and white children. The authors felt that this lent support to the construct validity of the I-E Control dimension as applied to grade school children. In a personal communication, however, Rotter informed the writer that this relationship has not held up in subsequent
use of the CPT. Pretesting the two measures with lower-class Negro children from St. Louis County, the writer found a very small, insignificant relationship \((r = -0.05)\).

2. Social Class

In reviewing the literature concerning social stratification, the author discovered that determining social class can be an extremely time-consuming and costly venture. The goal was to discover a fairly simple but valid method of classifying urban Negro boys with respect to the socio-economic status of their families. The class distribution of the communities in which the subjects live is markedly skewed toward the low end. Thus, even though subjects were chosen from two of the most "stable" neighborhoods, it would be impossible to find more than five or ten upper or even upper-middle class subjects. It was therefore decided that any class breakdown more elaborate than a dichotomy would be inappropriate. "Low" and "Middle" will be used in this study; "Middle" will refer to anyone above the low-class criteria, which will be described below.

The author decided to use Warner et al.'s (1960) Index of Social Characteristics as a basis and to modify it to fit the population being studied. Before discussing the actual categories and criteria employed in the study, Warner's system and a rationale for its modification will be presented.
a. Warner's System

Warner et al. developed two methods of measuring social class, the Evaluated Participation (EP) and the Index of Social Characteristics (ISC). The former is a procedure whereby several rating techniques are used to order interview data from informants who evaluate other community members' "participations". This method was used to study the social class system of Yankee City (Warner and Lünt, 1941).

The ISC was developed to provide a relatively simply technique for estimating social class when time, money, and personnel are limiting factors. It measures socio-economic levels, which are then translated into an index of social class position. Occupation, source of income, house type, and dwelling area are used as sub-indices. Each of these is rated on a 7-point scale, weighted, and totaled. The weights are based on the importance of each status characteristic in social class prediction.

Several authors (for example, Kornhauser, 1953; Kahl, 1957) point out that the ISC is not simply an index of objective characteristics, for it is the evaluations more than the jobs or houses that are being measured. Thus the ratings for each subindex are determined according to the prestige value of that type of item in the community. In other words, it is not the objective position an individual occupies on an occupation scale that is being ranked - it is the way the members
of the society evaluate that position and how people who occupy that position behave.

Warner claims that the classes he describes are empirically existing entities as opposed to hypothetical constructs. He defines class as "two or more orders of people who are believed to be, and are accordingly ranked by all the members of the community, in socially superior and inferior positions" (Warner and Lunt, p. 82). Thus, he defines class in terms of how the people themselves think of class, and he assigns individuals to class in terms of how they assign themselves. Warner's system is therefore a subjective one, emphasizing prestige more than power. It is the only system that has been validated against an independent measure of prestige from qualitative interviews (Kahl, 1957). The correlation between the ISC and EP methods is .97.

**Emphasis on occupation:** there seems to be little disagreement as to which single factor is the best predictor of social class. Occupation is consistently the highest correlate. Warner reports a correlation of .91 between occupation and EP. He weights occupation most heavily, as does Hollingshead (1959). Kahl and Davis (1955) compared 19 different indices of class position using factor analysis. Two factors accounted for most of the variance. The first was most closely related to measures of house and residential area. Kahl states
Indeed the role of the family in creating the occupational outlook of its children is the major device for perpetuation of stratification position through the generations. Far more important in the modern world than the amount of money that is inherited: (p. 294).

Hodges (1964) points out that occupation is such a popular and useful measure of social class because it is like a blanket term which identifies several other status symbols (such as money, education, prestige, values, ability, intelligence, etc.). In Reissman's (1959) terms, it has a "social reality". Edwards (1938), who was the first to organize occupations into categories representing levels of socio-economic status, writes about the source of occupational prestige. He explores various possibilities and concludes that an individual's prestige is determined by his behavior in living up to group standards. Americans seem to feel that occupation is one of the most important activities, and they confer prestige and esteem on men as a recognition of the skill and significance of their work. Finally, Kahl and Davis point out that an industrial society almost always evolves a prestige system closely related to occupation.

With respect to Warner's methods, occupation may be thought of as "a social role which describes the major work that a person does" (Kahl, p. 9). People grant prestige to known community members (EP) and to abstract occupational titles (ISC). Kahl goes on to point out that societies vary in the prestige they grant to various occupations, and that this reflects their values. Thus, values underlie the
prestige or importance assigned to different occupations.

**Critique and Application**: Warner has been criticized on several grounds. Here we shall be most concerned with limitations in application of the ISC to different groups.

Hodges feels that its inherent dependence on individual evaluation limits the ISC to a rough measure of relative social status. Kornhauser summarizes criticism into various areas: Warner's definition of class, emphasis on prestige or status, de-emphasis on economic factors, and small size of places studied. The last criticism has obvious relevance to the applicability of Warner's system to a large, urban community like St. Louis.

In order to convert an ISC score into a social class equivalent, one must either obtain EP ratings or use a conversion scale based upon the Jonesville Data. Jonesville and Yankee City are relatively small towns in the Midwest and New England, respectively. Most of the informants were middle and upper-class people, who may not differentiate on the basis of money as much as lower-class people do. Hall (1951) claims that a large city is more likely to have several disparate hierarchies, each having its own prestige scale, than one over-all ranked hierarchy. Lipset and Bendix (1951) re-examined the Warner et al. study and concluded that prestige classes may only be relevant for small towns. Power hierarchies and interest groups may need to be considered in metropolitan areas.
b. Measuring Middle and Low Class Negroes

The major criticism is that Warner et al. have not delimited the class structure for the whole country. The stratification for a large city is probably considerably more complex and dynamic than Yankee City or Jonesville. Even more crucial to the present study is the matter of ethnic groups - especially Negroes. The previous discussion regarding castes and classes suggests that a system which successfully predicts the social class structure of a Negro community might differ from the ISC in emphasis on certain indices.

It must be kept in mind that the writer was interested in tapping class-value distinctions as much as possible. Specific indices like occupation, education, income, etc. are only of interest to the extent that they correlate with and hence predict social class values. We have seen that the most frequently used correlates of social class are somewhat dependent on the particular society in question. For example, one result of the relative lack of occupational differentiation in Negroes has been the development of a more fluid class system; thus, the occupational status required to move up the class ladder is lower than that required in white society.

The problem was how to get at value distinctions. Although limited to the use of correlates, the author decided to select ones which might tap things less specific and concrete than amount of income or years of education. The idea was to search for evidence of
maintaining "respectability" - even though the actual economic condition might be no better than lower-class neighbors.

We have learned that Warner's ISC is not a completely "objective" system. One must first learn about the culture he is studying and several ratings must be made. Although occupation has been found to be the best single predictor of social class, accuracy can be increased by using more than one index. Kahl and David found that house and residential area was highly correlated with - but distinguishable from - occupation.\(^2\) The present study used both house-type and occupation of parents to dichotomize subjects into "Low" and "Middle". These two indices were not weighed and summed as in Warner's ISC, but were used as independent measures. Housetype was first included and then most heavily emphasized because: (1) the writer did not feel completely confident with the occupation data; (2) something was needed to tap the actual immediate environment in which the child lives; and (3) house-type was hoped to relate to values ("respectability" etc.).

**Occupation**: School records as well as self-report data were used to obtain parents' occupation. These data were classified using Warner et al.'s 7-point occupational scale as a basis (See Appendix D). Various classifications of occupations such as Edwards (1940),

\(^2\)Income was not a good measure of either factor.
Smith (1943), and 1960 Census data were used to supplement. In regard to modifying the scale, the previously discussed works—especially Black Metropolis were quite helpful. Here, for example, middle-class would include not only white-collar workers but "steady blue-collar workers whose values and family-centered lives mark them off from the mass of manual workers" (Drake and Cayton, p. 242).

House Type: A modified version of Warner's 7-point house-type scale was used as a basis (See Appendix E), with considerably more emphasis placed on the condition and appearance rather than the size of the house. Again, other classifications such as Mack's (1951) and Census data were used to supplement. Since none of the subjects lived in dwellings which would fall into Warner's top three or four categories, a five-way system was devised to rate the outside of each house (See Appendix F). The idea was to try to tap the families who lived in what is basically a lower-class house, but who maintained it according to their middle-class values (the "strainers" and "strivers"). This was the reason that the condition was stressed rather than the size of the house. "Condition" here refers not only to the physical structure itself, but also the grounds and "extras" such as curtains, flowers, etc.

The final decision regarding the Middle-Low class dichotomy considered both house-type and parents' occupation, with greater
emphasis on the former. All those subjects whose houses were classified as 1 or 2 were placed in the Middle category. There were also 11 subjects who lived in class 3 houses, but their parents were quite high on the occupation scale. These were also called Middle class. All other subjects were called Low class. This procedure resulted in 40 subjects being classified as Middle class and 66 subjects classified as Low class. As a result of the greater emphasis on house type, the 5-point house-type scale correlated with social class .77, but the occupation scale correlated with social class only .36.

3. Risk-Taking

The criteria used to select risk-taking tasks were: (a) one would clearly be perceived as skill-determined and the other as chance-determined, but both could be used to measure conservative versus risky strategies; (b) both would involve as much nonverbal subject participation as possible— that is, behavioral as opposed to hypothetical tasks (Slovic, 1962); (c) novelty, immediate feedback, and extrinsic reward could be equated on both; and (d) both could be interesting, challenging, and fun for the population to be studied.

It should be explained that two different tasks were chosen in order to minimize the possibility that subjects would not really perceive one as chance-determined and the other as skill-determined. The alternative was to attempt to induce chance and skill sets by using
one task and varying instructions. This would allow for excellent statistical comparisons between chance and skill behavior. However, there are two disadvantages which, in the writer's opinion, overpower this approach: 1) we would have no way of knowing whether the subjects really believed the deceiving instructions, and 2) we could not use our "each-subject-his-own-control" design because subjects would be limited to either chance or skill rather than both conditions.

With respect to the second criterion, the writer was more interested in what subjects would actually do rather than what they say they will do. Thus the two games involved payoff conditions whereby subjects actually experienced positive and negative consequences of their choices in the form of "points". The variable of concern is related to probability preferences rather than to payoff preferences, although under these conditions one cannot dissociate one from the other. Thus, like Liverant and Scodel (1960), it is assumed that the subjective value of points per se was randomly distributed between groups.

a. Chance Risk-Taking Condition

A gambling-type game in which the subject may select among six different "bets" was used to measure risk-taking in the chance-determined situation. The apparatus included a large cardboard circle which was divided into eight wedges of equal area and lettered A through H. A movable pointer was mounted through the center and was free to
spin, thus landing on one of the eight areas (letters) each time. There was no attempt to manipulate outcomes experimentally, they were determined entirely by chance. The object of the game was to guess which letter the pointer would land on and make a bet on the outcome (similar to roulette). There were six bets which ranged in probability of success ($P_s$) from $1/8$ to $6/8$, and there were point values accompanying each bet which ranged from forty to seven. All six bets were shown on a payoff matrix (See Appendix G) which was mounted underneath the wheel and pointer. Each bet told the subject how many letters he could choose, how many points he could win, and what his chances were of winning that bet. The payoff matrix was constructed so that in each case, probability of winning times points to be won approximated a constant (40) as closely as possible without using decimals. Thus the expected value of any ten trials at any level equalled fifty, and "maximization of expected utility" was impossible.

The chance game was administered in groups of one classroom at a time. Since the skill measure was taken individually, individual administration of the chance measure would have eliminated individual versus group effects; however, consideration for the school as well as practical reasons dictated group administration whenever possible. Pretesting indicated that although some children seemed to be competing with their classmates, there was a minimum of copying others or lack of comprehension.
b. Skill Risk-Taking Condition

Elements from shuffleboard (Atkinson et al., 1960), ring toss (Litwin, 1958; Atkinson and Litwin, 1960), and volleyball throw (de Charms and Davé, 1965) were combined into a "beanbag toss" game. The object was to throw beanbags into a basket which acted as a fixed target. Corresponding to the six different bets of the chance game, there were six different lines on the floor which varied in distance from the basket. They were lettered A through F and they represented increasingly difficult throws. Pretesting empirically established the actual distances to be used so that almost all subjects would have high success at the closest (easiest) level, with increasing difficulty up to the furthest (most difficult) level. (See Appendix H for details of the apparatus and instructions).

Most researchers have either assumed the different probability levels without measuring them or simply used the group's performance to extrapolate to the individual in terms of his subjective probability (for example, Atkinson and Litwin, 1960). De Charms and Davé (1965), however, had each subject perform several "practice" throws in order to learn his own empirical probabilities of success so that subjects could be equated for skill. This same procedure was followed in the present study. Individual administration of the skill condition was necessary in order to assess each subject's probability at each distance. Thus, each subject could then select from which distances
to throw on the basis of his own probabilities rather than a group norm. As in the chance game, all levels had an expected value (probability \times points) of approximately forty with the exception of the 0/8 situation which was arbitrarily assigned the value of 60 points.

c. Measures of Risk-Taking Strategy

There are several ways in which the data obtained in the chance and skill conditions may be viewed. One approach might be called "conservative versus risky" and another "moderate versus extreme". Lefcourt (1965) and Liverant and Scodel (1960) both used the conservative versus risky analysis; many of the achievement motivation-risk-taking studies have analyzed their data according to the moderate versus extreme approach.

"Conservative versus risky" refers to the comparison between high probability-low payoff versus low probability-high payoff choices. It also refers to various indices of variability, and these will be discussed below. High, intermediate, and low probability can be determined in absolute or relative ways. Absolute means that the experimenter decides to call certain probabilities high, intermediate, and low, and sets up his experiment that way. Here, for example, the following probabilities might be used: For the skill condition - high = 6/8 to 8/8; intermediate = 3/8 to 5/8; and low = 0/8 to 2/8. In the chance condition - high = 5/8 to 6/8; intermediate = 3/8 to 4/8;
and low = 1/8 to 2/8. Thus, in an absolute analysis, high, intermediate, and low each contain three probability levels in the skill condition and two in the chance condition.

In experiments interested in differences between Internals and Externals (Liverant and Scodel) and between Negroes and whites (Lefcourt), differences in frequency of choices at low, intermediate, and high probability bets are typically tested for significance using t tests and/or Mann-Whitney U tests (because distributions are quite skewed). In other words, what they really test is frequency of choices (bets) at various levels. For example, Lefcourt's hypothesis was that Negroes would choose more high probability bets and less low probability bets than whites. It is thus not at all clear what a p-level means here. It would be far better in terms of clarity and statistical power to have a score for each subject and test differences between subjects.

The plan here is to present the absolute comparisons and analyses of frequency of choices in graphic form. The "safe versus risky" analyses will emphasize relative differences between Internals and Externals and between Middles and Lows. Thus, rather than predicting that Internals will select high probability choices and Externals low probability choices, we shall see whether Internals select a more conservative or "safer" strategy than Externals, and these differences between subjects will be tested for statistical significance.

In the chance condition, of course, the Ps levels are completely
independent of the subject's performance because they are determined by "the laws of probability". Assuming the wheel is fair, no one can influence the outcome, and no one can "learn" because each trial is independent of each other trial. Thus in the chance condition, high, intermediate, and low probability are not determined by the subjects, and there can be no subject who is more skilled than any other. On the other hand, things are different in the skill condition. Here the range of probabilities or distances which are considered high, intermediate, and low depend upon the subject's skill - his actual performance in practice trials. Thus, empirical probability of success must be computed separately for each subject. The experiment was set up so that subjects would have full knowledge of objective probabilities of success regarding outcomes in both chance and skill conditions.

Most of the achievement motivation - risk-taking studies apply the "moderate versus extreme" approach (for example, Atkinson, de Charms, McClelland). The situations are almost always skill-determined, and the concern is with how much the individual's choices vary around the group norm. Again, data may be analyzed in absolute or relative ways. Atkinson et al. (1960) used a "distance deviation score" which measures how much the subject varies from the group mean in his selection of distances. The measurement of actual probabilities allows for the computation of "probability deviation scores" (de Charms and Davé, 1965). This is defined as "the deviation of
probabilities around an individual's point corresponding to the average probability" (p. 561). The deviation of each probability level choice from the group mean of choices is computed for each individual, disregarding sign. Thus, a low score indicates "moderate" risk, that is, subject's choices are concentrated in the middle ranges; a high score indicates "extreme" risk, that is subject's choices range farther out in either direction. The advantage of the probability deviation score is that it equates subjects for skill and compares only the type of risk they are taking with their own skills. 3

In the chance condition, the analysis similarly depends upon the probabilities actually chosen, but here probability of success for each bet is predetermined on the basis of chance. Computing the deviation of each choice from the group mean for each subject, disregarding sign, yields a probability deviation score for each subject.

In addition to Ps and payoff, "conservative" and "risky" also involve variability from trial to trial. Liverant and Scodel explain that a strategy which attempts to maximize success (a "cautious and planned selection of probabilities") involves restriction in choice of

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3 This appeared to conform more closely to Atkinson's model which assumes that the choice of a place to shoot from is made with probability of success in mind and is only secondarily related to actual distances. "It shows how S's choice of shots varies around a point where he is equally as successful as all other Ss" (de Charms and Davé, 1965, pp. 561-562).
probabilities. Greater variability is thus said to correspond to a lack of strategy. Variability can be measured in several ways, the simplest of which is frequency of shifts. This is merely the number of times the subject changes the probability levels from trial to trial, regardless of magnitude or direction of shifts. Magnitude of shifts involves weighting the shifts in terms of how many probability levels are jumped. Here a shift from one probability to the next might be given the weight of 1; skipping one and jumping to the next probability might be weighted 2, etc.

Lefcourt adds a third measure of variability - unusual shifts. This measure reflects a belief in the gambler's fallacy, and it manifests in shifting to a higher probability after success or to a lower probability after failure. Instead of using his feedback to test his ability, the subject functions as if he believes the "law of averages" is operating. Thus, if successful, he thinks he had better take an easier one next time; and if he fails, he thinks that he is due for a success so he shifts to a harder one. In relation to the present study, if the subject operates this way he should have a greater number of unusual shifts than the subject who feels he has some control over the situation. This latter type of subject should vary his expectation of outcomes with previous outcomes and thus exhibit fewer unusual shifts. The incidence of unusual shifts has been correlated with I-E measures (Simmons, 1959) and is found more commonly in chance than skill situations.
(Phares, 1957). In order to reduce confounding of unusual shifts with number of shifts, the percentage of unusual shifts or number of unusual shifts divided by the total number of shifts will be employed in the present study.

We will also record subjects' success in the skill situation by noting how many of his forty-eight practice shots land in the basket. Finally, change scores will be computed in terms of mean Ps and variability scores. This is simply the absolute difference between S's mean Ps in chance and his mean Ps in skill.

Conceptual Hypotheses

Several different types of variables have been shown to relate to risk-taking behavior. We have seen that one's generalized expectancy for Internal versus External Control, one's specific expectancy regarding the situation at hand, and one's social class values may be correlates and/or determinants of how one behaves in a risk-taking task. Indeed, risk-taking behavior may be a function of all of these variables.

The main purpose of the study was to explore possible relationships between and among the measures of I-E, social class, and risk-taking in chance and skill situations. The aim was thus exploratory more than "experimental"; that is, the idea was to discover relationships more than to "prove" or "disprove" specific hypotheses.
Operational hypotheses will be presented in a later section. Our task at this point is to convey to the reader 1) which relationships and effects will be examined, and 2) what expectations are held in relation to them.

We plan to examine the relationships among Bialer, CPT, social class, and IQ scores. Next, the relationships among the risk-taking measures will be examined, and we shall also look at the chance versus skill data (across all subjects). Finally, we shall make three main predictions involving effects of I-E and social class on risk-taking.

General Expectations

1. Relationships Between Independent Variables:

   a) On the basis of pretesting with a similar population and on the basis of conceptual differences in measuring, we expected little or no relationship between the two measures of Locus of Control.

   b) We expected that there might be a significant correlation

   4Locus of Control and social class will be referred to as the "independent variables". The term "independent" is used to imply only that changes in these variables are not dependent upon changes in any other-specified variables. We do not mean to imply that we are experimentally manipulating these variables in order to see what effects changes in them bring about in the dependent variables.
between Locus of Control and social class, but no specific predictions concerning Bialer versus CPT were made.

c) We expected no significant differences between groups on IQ or skill.

2. Relationships Between Dependent Variables (Risk-Taking Measures):

a) On the basis of the Liverant-Scodel and Lefcourt studies, we expected that higher mean Ps and lower mean distance scores might correlate significantly with lower variability (shifting) scores.

b) If the chance-skill factor were based upon identical situations or games, then an hypothesis could have been made to the effect that subjects will play more conservatively in the skill situation as opposed to the chance situation. In other words, if chance versus skill expectancies were induced by instructions and the task was actually the same under both conditions, then such an hypothesis could have been tested. No such prediction could be made in the present study, since the chance and skill situations were actually two different games. Attempts were made to make these as conceptually similar and comparable as possible, but the fact remains that they were technically different. Although we cannot examine the main effect of
psychological situation by itself, we certainly can compare groups as to how they behave on chance and skill (first order interactions).

3. Predictions Regarding Effects of Independent Variables on Dependent Variables:
   a) Because Internals believe they can exert some control over behavior-outcome sequences, it was predicted that they would play both chance and skill games in a more cautious and planned (conservative) manner than Externals. By the same token, because Externals believe or expect that the Locus of Control of reinforcements lies outside of themselves, it was predicted that they would ignore objective probabilities and play both games in a less cautious and planned (more risky) way.

   A secondary interest involved the comparison of two different methods of tapping Locus of Control. The Bialer questionnaire and the CPT were both to be used to analyze the risk-taking data, and both main effects and interaction between the two measures were tested for significance. It was expected that the more extensive, indirect, thought sampling, "projective" technique would relate to risk-taking behavior more than a direct, forced-choice questionnaire measure.

   b) The second major hypothesis involved the prediction that social class would relate to risk-taking behavior in the
same way as did Locus of Control; that is, that Middles and Lows would assume conservative versus risky strategies just like Internals and Externals, respectively. The rationale for this prediction is sociological as well as personality-centered. It is expected that Lows react to their life situation by developing more risky methods of gaining desired goals. In other words, the idea here was to see if feelings of powerlessness and alienation would be manifested in playing the "long shots". Middles should feel that they are not powerless to determine their own reinforcements, and so they should behave more like Internals.

c) Internals have been shown to regulate their behavior by relevant environmental cues more than Externals; that is, situational pull has a greater effect upon Internals (Rotter and Mulry, 1965). Thus, although Internals were expected to behave more conservatively than Externals across situations (as in "a" above) Internals were expected to differ from chance to skill risk-taking more than Externals. What this amounts to is a prediction that Externals behave "externally" across the board, whereas Internals respond to the environment more appropriately.

The same idea might hold for social class and psychological situation; that is, that Middles would differ more from one situation to
another than Lows. To test these hypotheses we will look at change scores.

d) Although no hypotheses were made regarding second-order interactions, it is interesting to speculate about the possible interactions of Locus of Control, social class, and chance versus skill situation. On the basis of previous studies, one might expect something like the following:

A. Under skill conditions - middle-class Internals should demonstrate the most conservative strategies, lower-class Externals the riskiest strategies, with middle-class Externals and lower-class Internals falling in between (depending upon the relative importance of these variables for predicting risk-taking behavior).

B. Under chance conditions - lower-class Internals should demonstrate the most conservative strategies, middle-class Externals the riskiest strategies, with middle-class Internals and lower-class Externals falling in between.

Procedure

The Bialer Questionnaire, CPT, and chance risk-taking measures were administered in groups - one class at a time. The skill risk-taking measure was administered individually, and the social class
data were collected after all testing was completed. In order to be able to test for ordinal effects of skill and chance tasks, half of the subjects received the skill condition first and half the chance condition first. Thus, the order of data collection was as follows: all subjects took the Bialer, all subjects took the CPT; half the subjects (Group 1) played the chance game; the other half of the subjects (Group 2) played the skill game individually; Group 2 played the chance game; and Group 1 played the skill game individually.

The experimenter met with the children in their regular classrooms to administer the group measures. The only exceptions were situations where the school had one or more classes of fifth graders mixed with fourth or sixth graders. In such cases these children were equally split among the "pure" fifth grade classes for purposes of group testing. Also, whenever school routine allowed, all boys from two classes were combined for the chance risk-taking measure. When administering group measures, the experimenter's manner was that of a teacher - friendly but serious.

Bialer Locus of Control Questionnaire (See Appendix A)

The questionnaire was handed out and subjects were asked to help with this exercise. They were told there are no right or wrong answers but that they should tell how they think the questions should be answered. After reading the directions aloud, the experimenter read each question
twice and the subjects circled "yes" or "no". The measure took from five to ten minutes to complete.

Scoring the Bialer requires counting the number of questions answered in the Internal direction. Since the Internal and External answers are predetermined, scoring is simple and quick.

**Children's Picture Test of I-E Control (See Appendix B)**

The same procedure as above was followed with the cartoon measure (CPT), except here subjects were asked to write in the empty space above the person on the right what they would say if they were that person in that situation. Directions were read aloud and a sample cartoon was done for practice. The experimenter then read each cartoon and waited until most of the children were finished - a maximum of two minutes per cartoon. The measure took approximately ten to fifteen minutes.

Because the scoring of the CPT responses is somewhat more difficult than Bialer scoring, two people were used to score the CPT. Both scorers were advanced graduate students in clinical psychology. Their interscorer reliability was quite satisfactory in terms of the correlations between their overall scores for 76 protocols (r = .91) and their agreement on scores for 456 individual responses (92% agreement).

**Chance Risk-Taking (See Appendix G)**

The children were shown the apparatus and told that it was a game
of chance. After familiarizing them with the wheel, the payoff matrix was explained in detail. Following this the experimenter went through the first bet on the board for "practice". Then each child was given a small box with a cellophane top and slip in one side plus several copies of the betting form. Again for practice, the children were taken through the motions of each bet on the matrix. This involved circling the letters on the betting form, filling in information about the bet, and slipping the form into the box so that it could be viewed. When everyone had done this, the pointer was spun by the experimenter and a winning letter was determined. The subjects then filled in how many points they won on a "points won" form. Subjects thus familiarized themselves with the game and saw that copying from their neighbor was fruitless because he had no more control over the wheel than anyone else. Finally, it was explained that now there would be ten trials during which the subject may select any bet he wishes each trial. It was emphasized that one may try the same bet or change to a different bet each time. From this point on, all the experimenter needed to do was spin the wheel, call out the winning letter, and make sure the subjects were filling out the betting forms properly.

Pretesting indicated that at least one teacher or assistant experimenter should remain in the room with the experimenter because the children tended to become quite excited and noisy during this game. The game took approximately fifty to sixty minutes per group.
The situation was presented as a game of skill. It was explained that the object was to throw the beanbags into the basket, and the six distances were pointed out. The subject was allowed one warm-up throw from each distance in order to familiarize him with the game. He was then told that he was to take eight "practice" throws from each distance, following the order B D F A C E. It was explained that the experimenter would record the outcomes of these forty-eight throws so that when practice was complete, the subject could know what his chances of success were at each distance. When this was completed, the various levels of difficulty were explained to the subject in terms of his own ability at each distance. The number of shots in the basket at each distance equalled his empirical probability of success (Ps) for that level. As in the chance game, the incentive was "points", the significance of which was left unexplained. Points that could be won increased with the level of difficulty of distances chosen.

The above was impressed upon the subject both verbally and by having him assist the experimenter in arranging placards on the floor. The placards told how many shots were made and how many points could be won at each distance. The subject was then told that he was to

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5As in the de Charms and Davé study, pretesting indicated that the empirical probabilities of success in practice trials were not always monotonically decreasing with increased distance. (cont'd. next page)
take ten throws, only now he was to choose whichever distances he wished. Again, it was emphasized that he could try the same distance or move to a different one each time. The experimenter kept track of the number of points won on a blackboard in full view of the subject. To insure he understood the game, the subject was asked each trial to verbalize the letter of the distance he wished to try, what his chances of success were at that distance, and how many points he could win if he got the beanbag in the basket. It was expected that this procedure would also induce subjects to think of their choices in terms of their own performance on practice and the possible points which were assigned in accordance with each subject's own demonstrated skill.  

The apparatus required an area at least seventeen feet in length, preferably longer. Hallways, gymnasiums and nurses' offices were used. The effects of spectators and other uncontrolled factors were

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5(cont'd. from last page) For example, a subject may make three out of eight throws from distance C and five out of eight from D. When this occurred, the experimenter quickly plotted a smooth curve and assigned probabilities on this basis rather than the subject's actual performance.

6Points were established for each child separately according to the empirically established level of difficulty for him. Thus a skillful child who chose distance E, a difficult level, and made four out of eight throws at that distance (empirical $P_s = .50$), stood to gain ten points if successful. A less skillful child choosing the same level and making only one out of eight in practice (empirical $P_s = .13$), stood to win forty points, if successful. This procedure developed by de Charms and Davé (1965) thus equates subjects as to skill and emphasizes choices in terms of their own chances of success.
assumed to be randomly distributed among subjects. To reduce anxiety around the one-to-one interaction, the experimenter acted somewhat more relaxed and casual as compared with group testing. After the game, the subject was thanked and requested not to discuss it with his classmates until they all had a chance to play. The skill game took approximately twenty minutes per subject.

**Social Class Data**

Occupation and house data were collected and rated after all other measures were completed. The school records turned out to be a poor source of parents' occupations. The records were incomplete, vague, and generally not dependable. As a result, each child was asked to write down his mother's and father's job(s), who was (was not) in the home, and whether the family was receiving welfare. The children were given time to inquire at home if they so desired. These data were far from perfect but obviously superior to the school records. Teachers helped to fill in and often attested to the accuracy of their own pupils' reports.

**Operational Hypotheses**

In what follows, "Internals" refers to subjects who score above the median in the case of the Bialer questionnaire or below the median
on the CPT. "Externals" refers to subjects who score below the median on the Bialer or above the median on the CPT.

"Middles" and "Lows" refer to social class types as determined by house type and parents' occupation.

"Conservative" and "Risky" refer to risk-taking behavior. They are relative terms in that they only pertain to comparing groups of subjects, for example Internals and Externals. Thus no absolute criteria for conservative or risky are presented. Greatest emphasis was placed on mean Ps and mean distance, but probability deviation, number of shifts, magnitude of shifts, and proportion of unusual shifts were also analyzed. "Conservative" refers to relatively high mean Ps and relatively low mean distance scores; "risky" refers to relatively low mean Ps and relatively high mean distance scores. Based upon the Liverant and Scodel and Lefcourt data, "conservative" also refers to low deviation and less variability; and "risky" also refers to high deviation and greater variability.

HYPOTHESES:

1. Internal's risk-taking scores will be significantly more conservative than External's scores on both chance and skill tasks.

   a. Chance Condition

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7 The Bialer and CPT will be analyzed as independent measures.
(1) Internals will have significantly higher mean Ps than Externals.

(2) Internals will have significantly lower probability deviation score than Externals.

(3) Internals will have significantly fewer number of shifts than Externals.

(4) Internals will have significantly smaller magnitude of shifts than Externals.

(5) Internals will have significantly smaller proportion of unusual shifts than Externals.

b. Skill Condition

(1) Internals will have significantly higher mean Ps and lower mean distance scores than Externals.

(2) Internals will have significantly lower probability deviation and distance deviation scores than Externals.

(3) Internals will have significantly fewer number of shifts than Externals.

(4) Internals will have significantly lower magnitude of shifts than Externals.

(5) Internals will have significantly smaller proportion of unusual shifts than Externals.

c. Hypothesis 1 will hold for CPT groups more than Bialer groups; that is, there will be more significant differences
between CPT Internals and Externals on all risk-taking scores
than between Bialer Internals and Externals.  

2. Middles' risk-taking scores will be significantly more conservative
than Lows' scores on both chance and skill tasks.

a. Chance Condition

(1) Middles will have significantly higher mean $P$s than
   Lows.

(2) Middles will have significantly lower probability deviation
    than Lows.

(3) Middles will have significantly fewer number of shifts
    than Lows.

(4) Middles will have significantly smaller magnitude of
    shifts than Lows.

(5) Middles will have significantly smaller proportion of
    unusual shifts than Lows.

b. Skill Condition

(1) Middles will have significantly higher mean $P$s and lower
    mean distance scores than Lows.

(2) Middles will have significantly lower probability deviation
    and distance deviation scores than Lows.

\footnote{For clarity we shall use $I_{CPT}$ and $E_{CPT}$ to refer to CPT Internals and Externals, and $I_B$ and $E_B$ to refer to Bialer Internals and Externals.}
(3) Middles will have significantly fewer number of shifts than Lows.

(4) Middles will have significantly lower magnitude of shifts than Lows.

(5) Middles will have significantly smaller proportion of unusual shifts than Lows.

3. a. Internals will differ or change their risk-taking behavior from chance to skill situations significantly more than Externals. This requires calculating Ps and variability change scores. Operationally, the hypothesis states that Internals' change scores will be significantly greater than Externals' change scores.

b. The same hypothesis is made for social class; that is, Middles' change scores will be significantly greater than Lows' change scores.

No hypotheses for second or third order interactions were made.

Subjects

All fifth grade classes of all primary schools in a city school district of a large midwestern city were available to the experimenter. The district has become almost entirely populated by Negroes moving out from the redevelopment areas in the center-city. Socio-economically, the culture is mixed but the great majority of families have a low
income. In order to obtain as many non-lower-class subjects as possible, the writer selected two schools which were said to be located in more "stable" neighborhoods. This information was generously provided by the superintendent, assistant superintendent, and several principals of the district. In order to eliminate effects of sex and race, it was decided to use only male Negro subjects. One hundred and six fifth grade boys from the two schools constituted the sample in this study.

Data regarding the specifics of Bialer, CPT, social class, and IQ scores are presented in Appendix I. It is noted that our Bialer results were quite similar to those of Carpenter (1967) who used a very similar population. The CPT results were almost identical to Battle's (1962) norms for eighth grade boys.

Design and Analysis

All subjects took all tests including both risk-taking games, as opposed to one group taking only chance and the other only skill. The advantage of this "each-subject-his-own-control" design is that all subjects were comparing (experiencing) the same tasks.

In order to control for ordinal effects, half the subjects played the chance game before the skill game, and the other half of the subjects played the skill game before the chance game. Ordinal effect was built into the design as a control variable as a guard against
response set. Heckhausen (1967) criticized Atkinson for always giving skill first. If no differences are then found between chance and skill, this may be due to subjects establishing a set for skill and carrying it over to the chance task which immediately follows. The effect of this experimental control for order of tasks was tested for statistical significance and subsequently eliminated from all analyses due to lack of significance.

Subjects were divided into $I_B$'s and $E_B$'s and $I_CPT$'s and $E_CPT$'s by splitting as close to the median as possible (see Appendix I). Social class was determined by house-type and occupation, with no attempt to equalize the number of Middles and Lows. The nature of the risk-taking situation (chance versus skill) was the only variable that was manipulated by the experimenter.

The following analyses were performed:

(1) A complete product-moment correlation matrix between all independent and dependent variables. All correlations not involving IQ were based on N of 106. Since IQ scores were available for only 90 subjects, the other 16 subjects were excluded from the correlations involving IQ.

(2) Analyses of variance with unequal cell entries (Walker and Lev, 1953). The design was mixed modes (Hayes, 1963), since the "independent variables" were fixed but the subjects constituted random effects.
(a) 3-way multivariate analysis of variance (MANOVA). This analysis was performed by dividing subjects as to $I_B - E_B$, $I_{CPT} - E_{CPT}$, and Middle and Low class. All risk-taking scores - chance, skill, and totals - were used as dependent variables. This analysis was performed on all 106 subjects and also on the 90 subjects for whom IQ scores were available.

(b) 4-way MANOVA using Bialer, CPT, social class, and chance-skill. Here mean Ps, probability deviation, number of shifts, magnitude of shifts, and percentage of unusual shifts were analyzed. This analysis was also performed twice - once on all 212 observations and once on the 180 observations for which IQ scores were available.

(3) The above analyses were repeated with multivariate analysis of covariance, covarying IQ.

(a) 3-way analysis of covariance using 90 subjects.

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9 The Washington University computing facilities were used through NSF Grant G-22296.

10 In the chance situation, number of shifts, magnitude of shifts, and percentage of unusual shifts are based upon the six probabilities, all of which were available to all subjects each trial. In the skill situation, not all subjects had the same probabilities from which to choose. Thus, this score is based upon the six distances in the skill situation because, as in chance, all distances were available to all subjects each trial. Using distance rather than Ps thus makes for a better comparison with the chance situation.
(b) 4-way analysis of covariance on 180 observations.

(4) Frequency of probabilities (and distances) chosen were tabulated and graphed for all groups and all combinations of groups.

Since covarying IQ either had no effect or served to highlight differences, results will be reported in terms of analyses of covariance. Thus, none of the findings to be reported are due to IQ differences.
Our task here is first to examine the relationships among the "independent variables" and among the "dependent variables" and then to present the results of the analyses of covariance.

Relationships Among Independent Variables

Table 1 contains the correlations among the major independent variables (Bialer, CPT, and social class) as well as IQ and skill data. Since Battle's study was the only other one which used the CPT, we shall compare our results with her's when appropriate.

Table 1 indicates that subjects who were more successful in the skill game tended to be I_B's, Low class and less intelligent; however, none of the correlations involving success on skill were statistically significant.

Regarding IQ, we found small but significant correlations between IQ and Bialer scores (r = -.23, p < .05) and between IQ and social class (r = -.24, p < .05). Brighter subjects tended to be Middle class, E_B's, and I_CPT's. Although the last correlation was not statistically significant, it was in the opposite direction from Battle's data. She
TABLE 1

Product-moment Correlations Between Bialer, CPT, Social Class, IQ, and Skill†

<table>
<thead>
<tr>
<th></th>
<th>CPT</th>
<th>Social Class</th>
<th>IQ</th>
<th>Skill</th>
</tr>
</thead>
<tbody>
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<td>.10</td>
<td>-.23*</td>
<td>.10</td>
</tr>
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<td>----</td>
<td>.07</td>
<td>-.16</td>
<td>.00</td>
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<tr>
<td>Social Class †</td>
<td>----</td>
<td>---</td>
<td>-.24*</td>
<td>.14</td>
</tr>
<tr>
<td>IQ</td>
<td>----</td>
<td>---</td>
<td>----</td>
<td>-.17</td>
</tr>
</tbody>
</table>

† N=106 for all variables except IQ in which N=90.

†† Based on dichotomizing Ss into Middles (score of 1) and Lows (score of 2).

* p < .05.
found that high IQ subjects had slightly higher CPT scores (more Ex-
ternal), and this was true for both Negro and white as well as Low and
Middle class children. This is an interesting finding because our sub-
jects were similar to Battle's, and our CPT data conformed almost
exactly with her norms.

Even though the above correlations involving IQ were small, all
of the risk-taking data were analyzed with IQ as a covariate, so none
of the differences between groups were due to IQ.

Whereas Battle reported a correlation of -.42 (p < .01) between
Bialer and CPT scores, we found no such relationship. As in our
pretesting data, there was a very small, insignificant relationship be-
tween these two measures (r = -.03).

The small, statistically insignificant relationship between Bialer
and social class (r = .10) was in the opposite direction from Battle's
data. She found a significant correlation with $I_B$ covarying with high-
er socio-economic status.

Regarding CPT and Social Class, we found very little relationship
(r = .07). Middles tended to be slightly more $I_{CPT}$; but the differ-
ences were not nearly as great as Battle's. She found a significant
relationship between higher socio-economic status and $I_{CPT}$ (See Ap-
pendix J for comparison of Battle's CPT data with ours).

We may conclude from Table 1 that the Bialer, CPT, and social
class indices were measuring different things in our subjects, that is
they were truly independent of each other. In light of the extremely low correlation between Bialer and CPT, these may be treated statistically as two independent variables.

Relationships Among Dependent Variables

Table 2 presents correlations among the major dependent variables (risk-taking scores). As in Table 1, IQ data are included for interest and clarification. The brighter subjects tended to take less unusual shifts in both chance and skill. In the skill situation, they also shifted more frequently and stood closer to the target than the lower IQ subjects.

Table 2A indicates that several of the dependent variables were significantly related. In a general way (i.e. across situations), higher or more conservative Ps covaried with more extreme P deviation ($r = .23$, $p < .05$), greater number of shifts ($r = .41$, $p < .001$), and greater magnitude of shifts ($r = .38$, $p < .001$). Another way to say this is that a more risky strategy (lower Ps) covaried with moderate P deviation and fewer and smaller shifts. Parts B and C of Table 2 break these correlations down into chance and skill components, respectively. We may now see that the above relationships were quite similar for both conditions; however, the correlations were mostly insignificant in the chance situation and significant in the skill situation. In both cases, the more conservative mean Ps or mean distance
TABLE 2

A. Product-moment Correlations Among Total Risk-Taking Scores (Chance and Skill) and IQ

<table>
<thead>
<tr>
<th></th>
<th>Total P Deviation</th>
<th>Total No. Shifts</th>
<th>Total Mag. Shifts</th>
<th>Total % Unusual Shifts</th>
<th>IQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Mean Ps</td>
<td>.23*</td>
<td>.41***</td>
<td>.38***</td>
<td>0.04</td>
<td>.04</td>
</tr>
<tr>
<td>Total P Deviation</td>
<td>----</td>
<td>.07</td>
<td>.25**</td>
<td>0.16</td>
<td>-.01</td>
</tr>
<tr>
<td>Total No. Shifts</td>
<td>----</td>
<td>----</td>
<td>.76†</td>
<td>0.12</td>
<td>.21*</td>
</tr>
<tr>
<td>Total Magnitude Shifts</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>0.12</td>
<td>.12</td>
</tr>
<tr>
<td>Total % Unusual Shifts</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>-.25**</td>
</tr>
</tbody>
</table>

† confounded correlation

*  p < .05

** p < .01

*** p < .001
TABLE 2 (continued)

B. Product-moment Correlations Among Chance Risk-Taking Scores and IQ

<table>
<thead>
<tr>
<th></th>
<th>Chance P Deviation</th>
<th>Chance No. Shifts</th>
<th>Chance Mag. Shifts</th>
<th>Chance % Unusual Shifts</th>
<th>IQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chance Mean P's</td>
<td>.13</td>
<td>.18*</td>
<td>.10</td>
<td>.08</td>
<td>.02</td>
</tr>
<tr>
<td>Chance P Deviation</td>
<td>----</td>
<td>-.19*</td>
<td>.29**</td>
<td>.20*</td>
<td>.06</td>
</tr>
<tr>
<td>Chance No. Shifts</td>
<td>----</td>
<td>----</td>
<td>.57†</td>
<td>-.04</td>
<td>.05</td>
</tr>
<tr>
<td>Chance Magnitude Shifts</td>
<td>----</td>
<td>----</td>
<td>---</td>
<td>-.09</td>
<td>.06</td>
</tr>
<tr>
<td>Chance % Unusual Shifts</td>
<td>----</td>
<td>----</td>
<td>---</td>
<td>---</td>
<td>-.19*</td>
</tr>
</tbody>
</table>

† confounded correlation

* p < .05

** p < .01
TABLE 2 (continued)

C. Product-moment Correlations among Skill Risk-Taking Scores and IQ

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Skill - Mean Distance(^a)</td>
<td>-.33***</td>
<td>-.54***</td>
<td>-.49***</td>
<td>.16</td>
<td>-.24*</td>
</tr>
<tr>
<td>Skill - Distance Deviation</td>
<td></td>
<td>.17*</td>
<td>.39***</td>
<td>.12</td>
<td>-.09</td>
</tr>
<tr>
<td>Skill - No. Distance Shifts</td>
<td></td>
<td></td>
<td>.77(^\d)</td>
<td>-.01</td>
<td>.26**</td>
</tr>
<tr>
<td>Skill - Magnitude Distance Shifts</td>
<td></td>
<td></td>
<td></td>
<td>-.13</td>
<td>.13</td>
</tr>
<tr>
<td>Skill - % Unusual Distance Shifts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-.17</td>
</tr>
</tbody>
</table>

\(^\d\) confounded correlation

\(* \ p < .05 \quad ** \ p < .01 \quad *** \ p < .001\)

\(^a\) In the skill task, success (on practice trials) correlates with mean Ps ($r = .39, p < .001$) more than with mean distance ($r = .18, p < .05$).
D. Product-moment Correlations between Chance and Skill Risk-Taking Scores

<table>
<thead>
<tr>
<th>Risk-Taking Score</th>
<th>r between Chance and Skill</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Ps</td>
<td>.155</td>
</tr>
<tr>
<td>P Deviation</td>
<td>.027</td>
</tr>
<tr>
<td>Number of Shifts†</td>
<td>.357***</td>
</tr>
<tr>
<td>Magnitude of Shifts†</td>
<td>.202*</td>
</tr>
<tr>
<td>% Unusual Shifts†</td>
<td>-.066</td>
</tr>
</tbody>
</table>

† based on distance rather than Ps in the skill condition

*  p<.05

*** p<.001
covaried with greater (more extreme) deviation and with greater variability in terms of number and magnitude of shifting. In the chance situation, there was no significant relationship between unusual shifting and Ps; but in skill, more conservative distance (closer to the target) correlated with smaller proportion of unusual shifts.

Finally, part D shows the correlations between the risk-taking scores for chance and the same risk-taking scores for skill. Number and magnitude of shifts both correlate significantly across chance and skill. Mean Ps is in the right direction but statistically insignificant, and neither P deviation nor % unusual shifts correlate significantly across chance and skill. Our subjects behaved quite differently in the two conditions; none of the correlations between chance and skill are impressively high. We shall examine the chance versus skill results in more detail in the next section.

The correlations presented above have important implications with respect to a frame of reference with which to interpret and understand our results as well as test our hypotheses. In every case, a more conservative strategy covaried with greater deviation and variability scores. We shall attempt to discuss these findings later. All that needs to be said at this point is that there are highly significant correlations between measures of mean Ps (or mean distance) and deviation scores, and between mean Ps (or mean distance) and measures of variability. This means that these variables are not independent
of each other and should not be interpreted as such.

Effects of Independent Variables on Dependent Variables

Before presenting the results of the effects of Bialer, CPT, and social class groups on risk-taking, we should briefly take notice of the chance versus skill analysis of covariance for all subjects. As stated previously, this main effect may be due to the fact that the chance and skill tasks were different (as well as to actual differences in risk-taking strategy from situation to situation). Table 3A presents means and standard deviations for Ps, P deviation, number of shifts, magnitude of shifts, and proportion of unusual shifts for all subjects, and Table 3B indicates the results of the analysis of covariance. We see that subjects chose a more conservative mean Ps and were more variable on the chance task than on the skill task. All of these differences were highly significant. Subjects also deviated less and had a higher proportion of unusual shifts on chance than on skill; however, these differences were not statistically significant.

Figure 1 shows the frequency with which the various probabilities (in the chance situation) and distances (in the skill situation) were chosen. The chance curve represents the per cent of bets taken at each Ps, and the skill curve represents the per cent of shots taken at each distance for all subjects. The distance curve is presented to illustrate the behavior in the skill situation rather than the skill-mean
TABLE 3

A. Means and Standard Deviations of Risk-Taking Scores
   By Chance and Skill for All Ss

<table>
<thead>
<tr>
<th></th>
<th>CHANCE</th>
<th>SKILL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MEAN</td>
<td>SD</td>
</tr>
<tr>
<td>Mean Ps.</td>
<td>3.351</td>
<td>0.917</td>
</tr>
<tr>
<td>P Deviation</td>
<td>1.550</td>
<td>0.355</td>
</tr>
<tr>
<td>No. Shifts</td>
<td>7.293</td>
<td>1.633</td>
</tr>
<tr>
<td>Mag. Shifts</td>
<td>14.774</td>
<td>5.278</td>
</tr>
<tr>
<td>% Unusual Shifts</td>
<td>32.59</td>
<td>18.61</td>
</tr>
</tbody>
</table>

B. Analysis of Covariance for Risk-Taking Scores
   Chance vs. Skill

<table>
<thead>
<tr>
<th>RT SCORE</th>
<th>MS</th>
<th>F&lt;sup&gt;a&lt;/sup&gt;</th>
<th>P Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Ps</td>
<td>12.50</td>
<td>12.75</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>P Deviation</td>
<td>0.07</td>
<td>0.31</td>
<td>n. s.</td>
</tr>
<tr>
<td>No. Shifts</td>
<td>29.34</td>
<td>9.14</td>
<td>&lt; .003</td>
</tr>
<tr>
<td>Mag. Shifts</td>
<td>690.13</td>
<td>25.19</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>% Unusual Shifts</td>
<td>0.004</td>
<td>0.12</td>
<td>n. s.</td>
</tr>
</tbody>
</table>

a df = 1,168
FIGURE 1

Frequency of bets (chance) and shots (skill) for all Subjects (curves smoothed)

Skill Distances - above the line
Chance Ps - below the line
Ps curve, even though this means we are comparing probabilities with
distances. There are two reasons for this: 1. Subjects were limited
to six choices in both chance-Ps and skill-distance, but they could
choose from nine different probabilities in the skill-Ps situation; and
2. All six chance-probabilities and skill-distances were available to
all subjects each trial - whereas the skill Ps varied from subject to
subject. This is not an ideal comparison, but it is only presented to
familiarize the reader with the differences between subjects' behavior
in chance and skill conditions.

Figure 1 indicates that subjects behaved quite differently in skill
and chance situations. In chance, there was a preference for both very
easy (high Ps) and difficult (low Ps) bets, and against intermediate
ones. It looks as though the boys preferred the riskiest bets and chose
the safest of all for the purpose of gaining points. Thus, although the
mean Ps = .42, the 4/8 and 5/8 bets were chosen less often than any
others. In skill, the close (easy) distances were rarely chosen, and
there was a steady rise toward the furthest (most difficult) distances.
The mean Ps in skill = .37, and the mean distance = 12.1 feet. In
chance, approximately half of the bets were made at the higher three
probabilities and half at the lower three probabilities; in skill 70% of
the shots were taken from the furthest three distances and only 30%
from the closest three distances. Thus, bets were considerably more
evenly distributed in the chance condition than were shots in the skill
condition.

**Tests of Hypotheses:**

Since our main measures of conservative versus risky risk-taking strategy were mean Ps (for chance and skill) and mean distance (for skill), we shall examine these before proceeding to deviation and variability scores.

Table 4A presents the means of chance-mean Ps, skill-mean Ps, skill-mean distance, and skill success scores for Bialer, CPT, and social class groups. (See appendix K for Ns, means, and standard deviations for each cell.) Table 4B presents the analyses of covariance for these groups.

Hypothesis 1 predicted that Internals would behave more conservatively (i.e., higher mean Ps and lower mean distances) than Externals in both chance and skill situations. With the Bialer questionnaire, there were no significant differences between I_B's and E_B's on chance-Ps or skill-Ps. In skill, I_B's tended to stand further from the target than E_B's; however, this difference was only marginally significant (p<.09) and is in part attributable to the fact that I_B's were also somewhat more skillful than E_B's. Thus, using the Bialer questionnaire to determine I-E, Hypothesis 1a and b was not supported.

With the CPT, I_CPT's behaved more conservatively than E_CPT's on chance-mean Ps (p<.05), skill-mean Ps (ns), and mean distance
TABLE 4

A. Means of Chance-Mean Ps, Skill-Mean Ps, Skill-Mean Distance, and Skill Success Scores for Bialer, CPT, and Social Class Groups

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Chance Mean Ps</th>
<th>Skill Mean Ps</th>
<th>Skill Mean Distance</th>
<th>Skill Success</th>
</tr>
</thead>
<tbody>
<tr>
<td>IB</td>
<td>46</td>
<td>3.47</td>
<td>2.82</td>
<td>12.62</td>
<td>24.07</td>
</tr>
<tr>
<td>EB</td>
<td>44</td>
<td>3.31</td>
<td>2.86</td>
<td>11.81</td>
<td>22.55</td>
</tr>
<tr>
<td>ICPT</td>
<td>39</td>
<td>3.61</td>
<td>2.96</td>
<td>11.68</td>
<td>23.39</td>
</tr>
<tr>
<td>ECPT</td>
<td>51</td>
<td>3.22</td>
<td>2.74</td>
<td>12.65</td>
<td>23.38</td>
</tr>
<tr>
<td>Middle</td>
<td>36</td>
<td>3.38</td>
<td>3.15</td>
<td>11.30</td>
<td>22.47</td>
</tr>
<tr>
<td>Low</td>
<td>54</td>
<td>3.40</td>
<td>2.63</td>
<td>12.84</td>
<td>23.89</td>
</tr>
</tbody>
</table>
TABLE 4 (continued)

B. Analysis of Covariance for Chance-Mean Ps, Skill-Mean Ps, Skill-Mean Distance, and Skill Success Scores

<table>
<thead>
<tr>
<th>SOURCE</th>
<th>df</th>
<th>Chance Mean Ps</th>
<th>Skill Mean Ps</th>
<th>Skill Mean Distance</th>
<th>Skill Success</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>MS</td>
<td>F</td>
<td>MS</td>
<td>F</td>
</tr>
<tr>
<td>Bialer (B)</td>
<td>1</td>
<td>0.57</td>
<td>0.75</td>
<td>0.05</td>
<td>0.04</td>
</tr>
<tr>
<td>CPT</td>
<td>1</td>
<td>3.09</td>
<td>4.08*</td>
<td>1.03</td>
<td>0.86</td>
</tr>
<tr>
<td>Social Class (SC)</td>
<td>1</td>
<td>0.05</td>
<td>0.07</td>
<td>5.10</td>
<td>4.27*</td>
</tr>
<tr>
<td>B x CPT</td>
<td>1</td>
<td>0.34</td>
<td>0.45</td>
<td>1.45</td>
<td>1.21</td>
</tr>
<tr>
<td>B x SC</td>
<td>1</td>
<td>0.08</td>
<td>0.11</td>
<td>0.31</td>
<td>0.26</td>
</tr>
<tr>
<td>CPT x SC</td>
<td>1</td>
<td>0.83</td>
<td>1.10</td>
<td>0.54</td>
<td>0.45</td>
</tr>
<tr>
<td>B x CPT x SC</td>
<td>1</td>
<td>0.03</td>
<td>0.03</td>
<td>0.22</td>
<td>0.18</td>
</tr>
<tr>
<td>Residual</td>
<td>81</td>
<td>0.76</td>
<td>----</td>
<td>1.20</td>
<td>----</td>
</tr>
</tbody>
</table>

* p < .05
** p < .005
Because I<sub>CPT</sub>'s and E<sub>CPT</sub>'s did not differ in ability, the differences on mean distances are not confounded by skill or success and hence indicate real differences in risk-taking strategy. Thus, using the CPT to determine I-E, Hypothesis 1a and b was supported.

Hypothesis 1c predicted that a and b would work for the CPT better than for the Bialer. This was supported in both chance and skill conditions with respect to mean Ps levels and mean distances chosen.

Hypothesis 2 a and b predicted that Middle class subjects would behave more conservatively than Low class subjects on both chance and skill, respectively. There were no significant differences in the chance condition, but in the skill condition Middles chose a higher mean Ps (p< .04) and closer mean distance (p<.004) than Lows. Thus Hypothesis 2a received no support, but hypothesis 2b was supported.

Putting the CPT and social class results together, we see that in the skill condition the I<sub>CPT</sub> and Middle class groups behaved more conservatively than the E<sub>CPT</sub> and Low class groups. This plus the fact that the correlation between these two variables was insignificant (r = .07) indicates that CPT and social class are independent variables which both relate to risk-taking behavior - at least in a skill situation.

Table 4 indicates no significant interactions among Bialer, CPT, and social class on any of the major risk-taking scores. Although there was a significant main effect for psychological situation: (chance
versus skill), there were no significant interactions between this variable and any other "independent variable". (See appendix K, part B).

Hypothesis 3 predicted that Internals would differ from chance to skill situations more than Externals, and that Middles would differ (change from situation to situation) more than Lows. Table 5 presents mean Ps, number of shifts, magnitude of shifts, and proportion of unusual shifts in terms of change scores for Bialer, CPT, and social class groups. (See appendix L for Ns, means, and standard deviations for each cell). Regarding Bialer, \( I_B \)'s were less responsive to changes in the psychological situation in terms of mean Ps; that is, they changed their mean Ps less than \( E_B \)'s. These differences were marginally significant (\( p < .07 \)). Regarding CPT, \( I_{CPT} \)'s were more responsive to situational differences in terms of mean Ps in that they changed their mean Ps behavior more than \( E_{CPT} \)'s, but this difference was not statistically significant. Regarding social class, Lows tended to change their mean Ps from situation to situation more than Middles, but this was not statistically significant either. Thus Hypothesis 3 received no support. CPT results were in the predicted direction, and both Bialer and social class results were in the opposite direction from predictions.

Although there were no significant interactions between independent variables, there were some interesting trends - especially in the skill condition. Before going on to the deviation and the variability
TABLE 5

A. Means of Change Scores\(^a\) for Bialer, CPT, and Social Class Groups

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Change in Mean Ps</th>
<th>Change in No. Shifts</th>
<th>Change in Mag. Shifts</th>
<th>Change in % Unusual Shifts</th>
</tr>
</thead>
<tbody>
<tr>
<td>IB</td>
<td>46</td>
<td>0.99</td>
<td>1.91</td>
<td>6.49</td>
<td>2.15</td>
</tr>
<tr>
<td>EB</td>
<td>44</td>
<td>1.24</td>
<td>1.30</td>
<td>5.79</td>
<td>1.82</td>
</tr>
<tr>
<td>ICPT</td>
<td>39</td>
<td>1.23</td>
<td>1.39</td>
<td>5.58</td>
<td>1.74</td>
</tr>
<tr>
<td>ECPT</td>
<td>51</td>
<td>1.03</td>
<td>1.79</td>
<td>6.58</td>
<td>2.17</td>
</tr>
<tr>
<td>Middle</td>
<td>36</td>
<td>1.04</td>
<td>1.34</td>
<td>6.23</td>
<td>1.60</td>
</tr>
<tr>
<td>Low</td>
<td>54</td>
<td>1.17</td>
<td>1.80</td>
<td>6.11</td>
<td>2.24</td>
</tr>
</tbody>
</table>

\(^a\) change score = difference between score in chance and score in skill
### TABLE 5 (continued)

#### B. Analysis of Covariance for Change Scores

<table>
<thead>
<tr>
<th>df</th>
<th>Change Mean Ps</th>
<th>Change No. Shifts</th>
<th>Change Mag. Shifts</th>
<th>Change % Unusual Shots</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MS</td>
<td>F</td>
<td>MS</td>
<td>F</td>
</tr>
<tr>
<td>Bialer (B)</td>
<td>1</td>
<td>2.08</td>
<td>3.49†</td>
<td>6.47‡</td>
</tr>
<tr>
<td>CPT</td>
<td>1</td>
<td>1.39</td>
<td>2.34</td>
<td>2.59</td>
</tr>
<tr>
<td>Social Class (SC)</td>
<td>1</td>
<td>0.40</td>
<td>0.67</td>
<td>1.47</td>
</tr>
<tr>
<td>B x CPT</td>
<td>1</td>
<td>0.03</td>
<td>0.05</td>
<td>1.77</td>
</tr>
<tr>
<td>B x SC</td>
<td>1</td>
<td>0.09</td>
<td>0.15</td>
<td>0.24</td>
</tr>
<tr>
<td>CPT x SC</td>
<td>1</td>
<td>0.65</td>
<td>1.09</td>
<td>0.16</td>
</tr>
<tr>
<td>B x CPT x SC</td>
<td>1</td>
<td>0.81</td>
<td>1.36</td>
<td>0.14</td>
</tr>
<tr>
<td>Residual</td>
<td>81</td>
<td>0.60</td>
<td>----</td>
<td>2.12</td>
</tr>
</tbody>
</table>

† *p < .07*

‡ *p < .09*
measures, the interaction data will be presented graphically. Since the greatest differences occurred in the skill situation, Figures 2, 3 and 4 are presented to illustrate the interactions between Bialer and CPT, Bialer and social class, and CPT and social class, respectively. Because subjects were free to choose distances, each of these figures (like Figure 1) represents a composite. That is, some subjects chose some of the distances, but not all distances represent all subjects and not all subjects represent all distances. Thus, there is no way to analyze these data statistically, but they do present a picture of the interactions.

Although the Bialer and CPT bear little or no direct relationship to one another, Figure 2 indicates that to a considerable extent these measures operate as opposites in the skill risk-taking situation. The greatest difference was between \( I_B^{-E_{CPT}} \) and \( E_B^{-I_{CPT}} \) groups. \( I_B^{-E_{CPT}} \)'s prefer the most difficult (furthest) distances; \( E_B^{-I_{CPT}} \)'s prefer the ones of intermediate difficulty. It is true that \( I_B^{-E_{CPT}} \)'s were slightly more skillful, but these differences were not significant.

Regarding Bialer by social class interaction, Figure 3 shows that the greatest difference was between Bialer I - Low class (\( I_B^{-Lows} \)) and Bialer E - Middle class (\( E_B^{-Middles} \)). \( I_B^{-Lows} \) definitely preferred the furthest distances, while \( E_B^{-Middles} \) and other groups preferred intermediate distances. Again, the \( I_B^{-Lows} \) were slightly more skillful but not significantly.
FIGURE 2

Frequency of Shots at Each Distance for Bialer x CPT Groups on Skill (curves smoothed)

Bialer CPT

- Internal Internal
- Internal External
- External Internal
- External External

% of Shots

4.0 6.5 9.0 11.5 14.0 17.0
A B C D E F

Distances
FIGURE 3

Frequency of Shots at Each Distance for Bialer x Social Class Groups on Skill (curves smoothed)

<table>
<thead>
<tr>
<th>Bialer</th>
<th>Social Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal</td>
<td>Middle</td>
</tr>
<tr>
<td>Internal</td>
<td>Low</td>
</tr>
<tr>
<td>External</td>
<td>Middle</td>
</tr>
<tr>
<td>External</td>
<td>Low</td>
</tr>
</tbody>
</table>

% of Shots

Distances

A  B  C  D  E  F
FIGURE 4

Frequency of Shots at Each Distance for CPT x Social Class Groups on Skill (curves smoothed)

<table>
<thead>
<tr>
<th>CPT</th>
<th>Social Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal</td>
<td>Middle</td>
</tr>
<tr>
<td>Internal</td>
<td>Low</td>
</tr>
<tr>
<td>External</td>
<td>Middle</td>
</tr>
<tr>
<td>External</td>
<td>Low</td>
</tr>
</tbody>
</table>

% of Shots

4.0 6.5 9.0 11.5 14.2 17.0
A   B   C   D   E   F

Distances
Regarding CPT by social class interaction, Figure 4 shows the greatest difference was between CPT E - Low class (E\textsubscript{CPT} -Lows) and CPT I - Middle class (I\textsubscript{CPT} -Middles). E\textsubscript{CPT} -Lows preferred the furthest distances and I\textsubscript{CPT} -Middles preferred the intermediate ones.

Looking at Figures 2, 3 and 4 simultaneously, we notice a striking resemblance between I\textsubscript{B} - E\textsubscript{CPT} 's, I\textsubscript{B} -Lows, and E\textsubscript{CPT} -Lows on the one hand, and E\textsubscript{B} - I\textsubscript{CPT} 's, E\textsubscript{B} -Middles and I\textsubscript{CPT} -Middles on the other. Table 6 indicates that the I\textsubscript{B} - E\textsubscript{CPT}, I\textsubscript{B} -Low and E\textsubscript{CPT} -Low groups preferred the more difficult distances to the easier distances at a rate of approximately 4:1; while the E\textsubscript{B} - I\textsubscript{CPT}, E\textsubscript{B} -Middle and I\textsubscript{CPT} -Middle groups preferred the difficult distances at a rate of approximately 3:2.

We have already noted that none of the mean Ps or mean distance interactions among Bialer, CPT and social class groups were statistically significant. Figures 2-4 show that the greatest differences among groups occurred at the furthest distances. In order to test whether these "dispersions" were statistically significant, the writer decided (post hoc) to analyze the number of shots taken at distances D-F. Table 7A presents the means for each group, and 7B presents the results of analysis of variance. All of the interactions were significant. Main-effect results indicate that social class contributed most, Bialer second and CPT least. Thus, even though mean Ps and
TABLE 6

Frequency of Shots Taken at Near and Far Distances for Various Groups of Ss

<table>
<thead>
<tr>
<th>GROUP</th>
<th>% OF SHOTS AT A-C</th>
<th>% OF SHOTS AT D-F</th>
</tr>
</thead>
<tbody>
<tr>
<td>$I_{BE}$-ECPT</td>
<td>23</td>
<td>77</td>
</tr>
<tr>
<td>$I_{BL}$-Low</td>
<td>20</td>
<td>80</td>
</tr>
<tr>
<td>ECPT-Low</td>
<td>23</td>
<td>77</td>
</tr>
<tr>
<td>$E_{BI}$-CPT</td>
<td>41</td>
<td>59</td>
</tr>
<tr>
<td>$E_{BM}$-Middle</td>
<td>43</td>
<td>57</td>
</tr>
<tr>
<td>$I_{CM}$-Middle</td>
<td>44</td>
<td>56</td>
</tr>
</tbody>
</table>
TABLE 7

A. Mean Number of Shots Taken at Distances D-F for Groups Portrayed in Figures 2-4

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean Number of Shots at Distances D-F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bialer x CPT</td>
<td></td>
</tr>
<tr>
<td>I_B - I_CPT</td>
<td>7.12</td>
</tr>
<tr>
<td>I_B - E_CPT</td>
<td>7.69</td>
</tr>
<tr>
<td>E_B - I_CPT</td>
<td>5.95</td>
</tr>
<tr>
<td>E_B - E_CPT</td>
<td>6.61</td>
</tr>
<tr>
<td>Bialer x Social Class</td>
<td></td>
</tr>
<tr>
<td>I_B - Middle</td>
<td>6.12</td>
</tr>
<tr>
<td>I_B - Low</td>
<td>8.06</td>
</tr>
<tr>
<td>E_B - Middle</td>
<td>5.71</td>
</tr>
<tr>
<td>E_B - Low</td>
<td>6.82</td>
</tr>
<tr>
<td>CPT x Social Class</td>
<td></td>
</tr>
<tr>
<td>I_CPT - Middle</td>
<td>5.61</td>
</tr>
<tr>
<td>I_CPT - Low</td>
<td>7.17</td>
</tr>
<tr>
<td>E_CPT - Middle</td>
<td>6.09</td>
</tr>
<tr>
<td>E_CPT - Low</td>
<td>7.64</td>
</tr>
</tbody>
</table>
TABLE 7 (continued)

B. Analysis of Variance for Number of Shots Taken at Distances D-F (N = 106)

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bialer (B)</td>
<td>1</td>
<td>29.9</td>
<td>5.07*</td>
</tr>
<tr>
<td>CPT</td>
<td>1</td>
<td>6.5</td>
<td>1.1</td>
</tr>
<tr>
<td>Social Class (SC)</td>
<td>1</td>
<td>62.5</td>
<td>10.6**</td>
</tr>
<tr>
<td>B x CPT</td>
<td>1</td>
<td>40.0</td>
<td>6.8*</td>
</tr>
<tr>
<td>B x SC</td>
<td>1</td>
<td>90.1</td>
<td>15.3**</td>
</tr>
<tr>
<td>CPT x SC</td>
<td>1</td>
<td>68.5</td>
<td>11.6**</td>
</tr>
<tr>
<td>B x CPT x SC</td>
<td>1</td>
<td>101.2</td>
<td>17.2**</td>
</tr>
<tr>
<td>Residual</td>
<td>97</td>
<td>5.9</td>
<td>----</td>
</tr>
</tbody>
</table>

* p<.05
** p<.01
mean distance interactions were not statistically significant, knowledge of Bialer and social class may add to our ability to predict risk-taking - at least in a skill situation.

Although the above was a post hoc analysis, it added considerably to our understanding of the data. What we seem to have in the skill condition is a ceiling effect. Thus, differences between groups at the extreme (far) end of the distribution might be most important to analyze.

Other Risk-Taking Measures

We have yet to examine results regarding deviation and variability scores.

1. Deviation Scores: P deviation scores were calculated for both chance and skill data, and distance deviation scores for skill data. It will be recalled that in the skill situation, the P deviation score equates subjects on skill (their actual ability) and compares only the type of risk they take with their own skill.

We have already seen that the deviation scores were not independent of mean Ps and mean distance scores in our data. High or extreme deviation correlated with high mean Ps, these correlations being significant in the skill but not in the chance condition. Thus "moderate" risk-taking (defined in terms of deviation from the group
norm) correlated with a risky mean Ps or mean distance, and "extreme" risk-taking correlated with a more conservative mean Ps or mean distance. We shall not attempt to interpret this result at this time; however, a brief explanation in terms of our results might be appropriate. The correlation reported may be due to the fact that mean Ps and mean distance were rather extreme to begin with - especially in the skill condition, in which these correlations reached statistical significance. When the group mean Ps is as low as .36, a subject who wishes to concentrate on more conservative shots would have to deviate from the group norm more than would a subject who wished to take high-risk shots. In this case then, the former would be "extreme" and the latter "moderate" in terms of deviation from the group norm.

Table 8 presents means and analyses of deviation scores for Bialer, CPT, and social class groups. (See Appendix M for Ns, Means, and Standard Deviation for each cell). Regarding hypotheses, analyses of covariance indicated no significant differences on chance or skill P deviation scores for Bialer, CPT, and social class groups or interactions. Distance deviation likewise failed to distinguish groups, with one exception. Middles were significantly higher (more extreme) on skill distance deviation than Lows (p<.02). Thus, with deviation scores, there was no support for any of our hypotheses, and there was a trend in the opposite direction from Hypothesis 2b (2).
TABLE 8

A. Means of Chance and Skill Deviation Scores for Bialer, CPT, and Social Class Groups

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Chance P Deviation</th>
<th>Skill P Deviation</th>
<th>Skill Dist. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>I_B</td>
<td>46</td>
<td>1.544</td>
<td>1.539</td>
<td>3.203</td>
</tr>
<tr>
<td>I_CPT</td>
<td>39</td>
<td>1.565</td>
<td>1.618</td>
<td>3.082</td>
</tr>
<tr>
<td>E_B</td>
<td>44</td>
<td>1.512</td>
<td>1.609</td>
<td>3.099</td>
</tr>
<tr>
<td>E_CPT</td>
<td>57</td>
<td>1.500</td>
<td>1.538</td>
<td>3.206</td>
</tr>
<tr>
<td>Middle</td>
<td>36</td>
<td>1.540</td>
<td>1.583</td>
<td>3.366</td>
</tr>
<tr>
<td>Low</td>
<td>54</td>
<td>1.523</td>
<td>1.567</td>
<td>3.010</td>
</tr>
</tbody>
</table>
TABLE 8 (continued)

B. Analysis of Covariance for Deviation Scores

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Chance P-Deviation</th>
<th>Skill P Deviation</th>
<th>Skill Dist. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td><strong>MS</strong></td>
<td><strong>F</strong></td>
<td><strong>MS</strong></td>
</tr>
<tr>
<td>Bialer (B)</td>
<td>1</td>
<td>0.04</td>
<td>0.30</td>
<td>0.15</td>
</tr>
<tr>
<td>CPT</td>
<td>1</td>
<td>0.07</td>
<td>0.56</td>
<td>0.21</td>
</tr>
<tr>
<td>Social Class (SC)</td>
<td>1</td>
<td>0.00</td>
<td>0.01</td>
<td>0.00</td>
</tr>
<tr>
<td>B x CPT</td>
<td>1</td>
<td>0.08</td>
<td>0.67</td>
<td>0.00</td>
</tr>
<tr>
<td>B x SC</td>
<td>1</td>
<td>0.02</td>
<td>0.15</td>
<td>0.14</td>
</tr>
<tr>
<td>CPT x SC</td>
<td>1</td>
<td>0.00</td>
<td>0.00</td>
<td>0.15</td>
</tr>
<tr>
<td>B x CPT x SC</td>
<td>1</td>
<td>0.00</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>Residual</td>
<td>81</td>
<td>0.12</td>
<td>----</td>
<td>0.36</td>
</tr>
</tbody>
</table>

* p < .02
2. **Variability Scores:** All chance and skill data were analyzed with respect to absolute frequency of shifts, magnitude of shifts, and proportion of unusual shifts. Recall that Table 2 showed that a more conservative strategy in terms of mean Ps or mean distance chosen correlated significantly with greater frequency and magnitude of shifting (and in skill with fewer unusual shifts).

Table 9 presents means and covariance analyses of the effects of these variability scores in both chance and skill situations for Bialer, CPT, and social class groups. (See Appendix N and Ns, Means, and Standard Deviation for each cell). Regarding Bialer, there were no significant differences between $I_B$'s and $E_B$'s. There was a tendency in the skill condition for $E_B$'s to shift more and take shifts of greater magnitude than $I_B$'s, however, these differences were not statistically significant. This, with the Bialer, there was no support for Hypothesis 1, although results were in the predicted direction.

Regarding CPT, $I_{CPT}$'s shifted more often on chance and skill, took shifts of greater magnitude on chance and skill, and tended to take a higher proportion of unusual shifts on chance and skill than $E_{CPT}$'s. The only statistically significant difference, however, was the first. Thus, with the CPT hypothesis 1 received no support. In fact, the results were in the opposite direction.

Regarding social class, there were no significant differences between Middles and Lows. Middles tended to shift more on chance
TABLE 9

A. Means of Chance and Skill Variability Scores\textsuperscript{a} for Bialer, CPT, and Social Class Groups

<table>
<thead>
<tr>
<th></th>
<th>Chance (Ps)</th>
<th>Skill (Dist.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. Shifts</td>
<td>Mag. Shifts</td>
</tr>
<tr>
<td>I\textsubscript{B}</td>
<td>46</td>
<td>7.39</td>
</tr>
<tr>
<td>E\textsubscript{B}</td>
<td>44</td>
<td>7.45</td>
</tr>
<tr>
<td>I\textsubscript{CPT}</td>
<td>39</td>
<td>7.82</td>
</tr>
<tr>
<td>E\textsubscript{CPT}</td>
<td>51</td>
<td>7.12</td>
</tr>
<tr>
<td>Middle</td>
<td>36</td>
<td>7.61</td>
</tr>
<tr>
<td>Low</td>
<td>54</td>
<td>7.30</td>
</tr>
</tbody>
</table>

\textsuperscript{a} based on Ps in chance and distance in skill
### TABLE 9 (continued)

**B. Analysis of Covariance for Variability Scores -- Chance**

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>CHANCE</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>No. Shifts</td>
<td>Mag. Shifts</td>
<td>% Unusual Shifts</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>MS F</td>
<td>MS F</td>
<td>MS F</td>
</tr>
<tr>
<td>Bialer (B)</td>
<td>1</td>
<td>0.11</td>
<td>0.06</td>
<td>31.85</td>
<td>1.12</td>
</tr>
<tr>
<td>CPT</td>
<td>1</td>
<td>10.99</td>
<td>5.31**</td>
<td>43.27</td>
<td>1.52</td>
</tr>
<tr>
<td>Social Class (SC)</td>
<td>1</td>
<td>1.19</td>
<td>0.58</td>
<td>0.86</td>
<td>0.03</td>
</tr>
<tr>
<td>B x CPT</td>
<td>1</td>
<td>0.35</td>
<td>0.17</td>
<td>33.16</td>
<td>1.16</td>
</tr>
<tr>
<td>B x SC</td>
<td>1</td>
<td>0.32</td>
<td>0.16</td>
<td>5.91</td>
<td>0.21</td>
</tr>
<tr>
<td>CPT x SC</td>
<td>1</td>
<td>2.64</td>
<td>1.28</td>
<td>0.02</td>
<td>0.00</td>
</tr>
<tr>
<td>B x CPT x SC</td>
<td>1</td>
<td>0.64</td>
<td>0.31</td>
<td>1.55</td>
<td>0.05</td>
</tr>
<tr>
<td>Residual</td>
<td>81</td>
<td>2.06</td>
<td>----</td>
<td>28.45</td>
<td>----</td>
</tr>
</tbody>
</table>

**p < .02**
TABLE 9 (continued)

C. Analysis of Covariance for Variability Scores -- Skill

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>No. Shifts</th>
<th></th>
<th>Mag. Shifts</th>
<th></th>
<th>% Unusual Shifts</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>MS</td>
<td>F</td>
<td>MS</td>
<td>F</td>
<td>MS</td>
<td>F</td>
</tr>
<tr>
<td>Bialer (B)</td>
<td>1</td>
<td>4.85</td>
<td>1.11</td>
<td>44.89</td>
<td>1.70</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>CPT</td>
<td>1</td>
<td>14.33</td>
<td>3.28*</td>
<td>60.41</td>
<td>2.29</td>
<td>0.07</td>
<td>1.84</td>
</tr>
<tr>
<td>Social Class (SC)</td>
<td>1</td>
<td>4.93</td>
<td>1.13</td>
<td>37.60</td>
<td>1.43</td>
<td>0.03</td>
<td>0.67</td>
</tr>
<tr>
<td>B x CPT</td>
<td>1</td>
<td>0.84</td>
<td>0.19</td>
<td>1.78</td>
<td>0.07</td>
<td>0.00</td>
<td>0.12</td>
</tr>
<tr>
<td>B x SC</td>
<td>1</td>
<td>4.98</td>
<td>1.14</td>
<td>1.83</td>
<td>0.07</td>
<td>0.07</td>
<td>1.97</td>
</tr>
<tr>
<td>CPT x SC</td>
<td>1</td>
<td>0.05</td>
<td>0.01</td>
<td>6.64</td>
<td>0.25</td>
<td>0.00</td>
<td>0.06</td>
</tr>
<tr>
<td>B x CPT x SC</td>
<td>1</td>
<td>2.03</td>
<td>0.47</td>
<td>10.40</td>
<td>0.39</td>
<td>0.00</td>
<td>0.09</td>
</tr>
<tr>
<td>Residual</td>
<td>81</td>
<td>4.37</td>
<td>----</td>
<td>26.38</td>
<td>----</td>
<td>0.04</td>
<td>----</td>
</tr>
</tbody>
</table>

* p < 0.07
and skill, take shifts of greater magnitude on chance and skill, take a
greater proportion of unusual shifts in skill, and take a smaller pro-
portion of unusual shifts in chance than Lows. Hypothesis 2 thus re-
ceived no support from variability scores.

None of the first-order interactions among Bialer, CPT and
social class were significant using any of the variability scores. There
was one isolated second-order interaction which reached statistical
significance (p < .02) on the chance-unusual shifts score. (See Appen-
dix N for Bialer x CPT x social class means). Since the \( I_B - I_{CPT} \)-
Middle group had the highest proportion of unusual shifts, and the
\( I_B - E_{CPT} \)-Middle group had the lowest, it appears that the CPT con-
tributed most to this three-way interaction. Of course little importance
should be attached to a single significant interaction.

Finally, Table 5 indicates that there were no significant differ-
ences between Bialer, CPT, and social class groups on variability
change scores. \( I_B \)'s tended to change their shifting behavior from
situation to situation more than \( E_B \)'s; \( E_{CPT} \)'s tended to change more
than \( I_{CPT} \)'s; and Lows tended to change more than Middles. Hypo-
thesis 3 thus received no support here.

As with the mean Ps and mean distance measures, there were
no significant interactions between any independent variables and psy-
chological situation on any of the variability measures (see Appendix
N, part B). There were some interesting trends, however, which
appear to parallel the mean distance interaction trends quite closely.

Glancing back to Figures 2 through 4, we see some of these parallels. The $I_B^{-E_{CP{T}}}$ group, who were the riskiest group on mean distance, took the fewest and smallest shifts; the $E_B^{-I_{CP{T}}}$ group, who were the most conservative on mean distance, took the most shifts (see Figure 2). Turning to Bialer x social class groups (Figure 3), we find that $I_B^{-Lows}$, who were the riskiest on mean distance, took the fewest shifts, while the other groups, who were similar on mean distance, shifted about the same amount. Finally, CPT x social class groups (Figure 4) show the same relationships. $E_{CP{T}}^{-Lows}$, who were the riskiest on mean distance, took the fewest and smallest shifts, and $I_{CP{T}}^{-Middles}$, who were the most conservative on mean distance, shifted the most.

There were other trends in the variability measures, but in almost every case they directly paralleled the mean Ps and mean distance results. For example, $I_B^{-}$'s took bigger shifts than $E_B^{-}$'s on chance and smaller shifts on skill, but $I_B^{-}$'s also were more conservative (higher mean Ps) than $E_B^{-}$'s on chance and riskier (lower mean Ps and lower mean distance) than $E_B^{-}$'s on skill.

We shall have more to say about interactions among Bialer, CPT, social class and psychological situation in the next section.
We attempted to use two measures of the Locus of Control construct plus social class data to predict the risk-taking behavior of Negro boys in two types of risk-taking situations. There are several limitations of which the reader should be aware in order to draw appropriate conclusions from this study. We shall briefly mention these and then proceed to discuss our findings.

1. Subjects: Our sample was quite homogeneous with respect to socio-economic and environmental conditions.

2. Risk-taking Games: We recognize that the range of situations sampled only begins to touch on the possible number of real-life situations in which such a variable might operate.

3. There are many variables other than Locus of Control and social class which influence decisions under conditions of risk; for example subjective probability, utility, etc. (Atkinson, 1957; Feather, 1959; Lewin et al., 1944). We shall emphasize Locus of Control and social class, while recognizing that our lack of knowledge regarding their
relationship to other sources of variance may reduce our understanding of their role in risk-taking. We shall thus stress the fact that we discovered some interesting relationships, and we shall only speculate about the causal nature of these relationships (causal in the sense of deterministic).

In regard to the measures and tasks, we discovered 1) that the boys could respond appropriately to the cartoons and that their responses could be scored reliably according to Battle's categories of Internality-Externality; 2) that even though the sample was quite homogeneous with respect to social class, we were able to distinguish roughly between middle- and lower-class using house type and parents' occupation as correlates of class values; and 3) that the boys were able to comprehend the chance and skill risk-taking games, they were quite eager and cooperative, and we were able to develop several risk-taking indices from their responses to these fairly simple games.

With respect to our major variables, we found the following:
1. The Bialer, CPT, and social class measures had very little relationship to one another in our sample; and 2. Most of the risk-taking indices were related to each other and could not be discussed in terms of independent measures of risk-taking.

Finally, in regard to our hypotheses we found that 1) the CPT predicted risk-taking behavior in both chance and skill conditions; 2) social class predicted risk-taking behavior - but only in the skill
condition; and 3) the Bialer questionnaire had little success predicting risk-taking behavior in either chance or skill conditions. There were also some interesting interaction trends - especially in the skill condition. Our task now is to discuss these findings with respect to theoretical meaning, relationships with previous research, and implications for future study.

A. Locus of Control, Social Class, Psychological Situation, and Risk-Taking

Before comparing our results with previous studies concerning Locus of Control and risk-taking, let us discuss our main "independent variables" - both in terms of how they related to each other and how they related to risk-taking behavior.

Measures of I-E

One of the most striking things about the data was the lack of significant relationships among our "predictor variables". The questionnaire and "projective" (or "thought sampling") measures of Locus of Control did not relate to each other (or to social class), and they did not relate to risk-taking in similar ways. Thus, with our sample, we may conclude that either these two measures were not measuring the same thing or they were tapping very different aspects (levels) of some underlying personality variable.

We saw in Chapter 1 that the I-E concept was derived from
Rotter's social learning theory, which emphasizes an instrumental paradigm and an empirical definition of reinforcement. De Charms (1967) points out that this emphasis leads to stressing the results of behavior (reinforcement) rather than the behavior itself. De Charms also points out that Rotter tries to go beyond a purely empirical definition of reinforcement when he brings in "pleasure" and "unpleasure" in distinguishing between "Internal" and "External" reinforcement. The point is that feelings of pleasure or unpleasure often cannot be reduced to objective outcomes of behavior.

... Basing the "internal-external" concept on reinforcement is a barrier to confrontation with the basic issue of personal knowledge that is clearly implied by Rotter's stress on the perceived contingency between behavior and results. The important results of behavior are not always objectively measurable as hinted by Rotter's statement that the "internal" person "has a strong belief that he can control his own destiny" (Rotter, 1966, p. 25) [de Charms, 1967, p. 540].

De Charms' criticism of Rotter's attempt to base the I-E concept on empirically defined reinforcement leads to the "Origin - Pawn" notion, which stresses perceived locus of causality rather than locus of control of reinforcement. Recall that an Origin is one who believes he is the causal agent of his own behavior and a Pawn is one who feels externally constrained. Perhaps our cartoon test was measuring something like this rather than expectancy for control of reinforcement.

In our study, the objective outcomes of behavior (reinforcement
in the form of "points") was held constant, and differences in risk-taking behavior were measured. The questionnaire and cartoon measures were both designed to tap subjects' beliefs or expectancies that they could or could not control the outcomes of their behaviors. The questionnaire, and intensity measure which elicits controlled responses, failed to predict risk-taking behavior; the cartoon test, an intensity measure which taps somewhat more spontaneously emitted thoughts, was quite successful in predicting risk-taking behavior. Thus, 1) there were few differences in risk-taking behavior between subjects who indicated on the questionnaire that they believed they could control their own destinies (I's) versus those who believed they could not (E's); and 2) the differences between Internals and Externals on the cartoon test manifested themselves in different ways of behaving in risk-taking situations.

Our data thus suggest that there may be important aspects of Internal versus External control of reinforcement which cannot be measured objectively. We may need to use a more "projective" or thought sampling technique to tap these aspects ("feelings", "personal knowledge"?). To the extent that Locus of Control is a matter of empirically defined reinforcement and objectively measured behavioral outcomes, an objective questionnaire may be a sufficient or even superior measure. However, to the extent that Locus of Control concerns the total experience or life style of the individual (including feelings and
subjective or personal knowledge), we may need a more subjective and/or extensive measure which taps somewhat "deeper" and broader aspects of functioning.

In light of the discussion above regarding differences between the two measures of Locus of Control, Rotter's suggestion that investigating relationships between paper and pencil versus projective measures might yield fruitful insights (See Rotter's statement quoted on page 55) seems an understatement! As a matter of fact, our results make us wonder about previous I-E studies because most of them employed a questionnaire measure.

I-E As Both Personality and Situational Variable

Although Rotter emphasizes the importance of considering both dispositional and situational variables, the present author feels that he tends to play down the personality factor in favor of the psychological situation. We certainly do not intend to make a case for the converse; however, we do contend that subjects' dispositions for Internal or External control (as measured by the CPT) definitely affected their behavior in both chance and skill risk-taking situations. This occurred despite the fact that the two situations were clearly defined as skill-and chance-determined, respectively (See Rotter's statement in Chapter 2, page 51 regarding this finding). What we are saying is that our subjects were influenced by both the psychological situation
(environmental conditions) and their own predispositions or tendencies toward Internal or External beliefs.

The fact that I<sub>CP</sub>T's and E<sub>CP</sub>T's behaved differently across situations supports the personality or typology notion, but let us examine the effects of the situation more closely. We must keep in mind that the psychological situation was manipulated for the purpose of studying differences between Locus of Control and social class groups in different risk-taking conditions. We tried to make the situations comparable for purposes of statistical treatment of the data, but we did not attempt to induce chance and skill expectancies artificially. It was for this reason that we used different tasks. We know that our subjects preferred riskier bets and varied less in the skill game as compared to the chance game, but we do not know how much of this was due to the differences between the psychological situations and how much was due to the differences between the two different risk-taking games themselves.

We controlled "expected value" within each game by holding constant Ps times reward points. This served to eliminate effects of figuring out maximum payoff bets or shots. Like Liverant and Scodel (1960), we assumed that the subjective value of points was randomly distributed among our groups, and that we were measuring probability preferences. Whereas this may be a fair assumption, our chance versus skill results suggest that "reinforcement value" was not the
same across situations. That is, points appeared to be less important to subjects in the skill situation, in which success involved more than merely winning points. It also involved the experience of throwing the beanbags into the basket.

What we are suggesting is that the differences between subjects' behavior in chance and skill may be partially due to differences in perceived reward. "Points" may have been more highly valued in the chance situation for several reasons. 1) Subjects naturally tended to compete with one another more in the chance game because it was administered in a group. Accruing points was more important than winning on any given trial. 2) The skill situation was individually administered, and thus subjects were only competing against themselves. Throwing the beanbag into the basket from a difficult distance may have been more rewarding than winning points at an easy distance. Subjects acted as if there was little question that they could succeed at a very close distance in the skill situation, but this did not seem to be the case in the chance game. Another way of saying this is that subjects attended to the distances more than the Ps levels in the skill game. There were several instances, for example, in which a subject chose to throw from the further of two distances even though the Ps and points to be won were identical for both distances.

We should also address ourselves to the fact that subjects shifted more in chance than skill. Liverant and Scodel argue that if a subject
tries to use experience (outcomes of previous trials) in the chance situation to learn, he is worse off than the subject who only uses the information given at the beginning (payoff matrix, etc.). It is true that improved performance based on learning is impossible in a chance situation, but for this exact reason one cannot be worse off or better off if the results are truly determined by chance. Thus, subjects who behave according to the gambler's fallacy in chance should be no worse off than any other subjects.

Most of our risk-taking differences between groups occurred in the skill condition. The only exception was with the CPT, which was sensitive enough to pick up differences in both chance and skill conditions. There were no significant differences for the two other independent variables (Bialer and social class) in the chance condition. It appears that when one's fate depends upon one's own skill, personality and sociological factors become more important determinants or predictors of risk-taking behavior than when outcome is a function of chance.

Bialer, CPT and Psychological Situation

Although not statistically significant in all cases, our results concerning Bialer x CPT x chance-skill interactions lend further evidence to the need for considering both personality and situational factors.

Table 10 is a rough summary of these interaction patterns.


**TABLE 10**

Interaction Patterns among Major Variables

**A. Bialer x CPT x Psychological Situation**

<table>
<thead>
<tr>
<th>Bialer</th>
<th>CPT</th>
<th>Chance</th>
<th>Skill</th>
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<tr>
<td>E</td>
<td>E</td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>

**B. Locus of Control x Social Class x Psychological Situation**

<table>
<thead>
<tr>
<th>Locus of Control</th>
<th>Social Class</th>
<th>Chance</th>
<th>Skill</th>
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</table>

*a all Locus of Control x social class comparisons were identical for Bialer x social class and CPT x social class.*
Subjects who claim to be Externals on the questionnaire but turned out to be Internals on the cartoon test ($E_B - I_{B \text{CPT}}$')s tended to behave more conservatively in both chance and skill situations. Subjects who scored in the Internal direction on both measures ($I_B - I_{B \text{CPT}}$')s also behaved more conservatively in chance but more risky in skill. Finally, subjects who turned out to be External on the cartoon test tended to behave in a more risky way on both chance and skill - regardless of whether they answered the questionnaire in an Internal or External way ($I_B - E_{CPT}$'s and $E_B - E_{CPT}$'s).

These interaction trends became even more interesting when considered in the light of Battle's discussion regarding types of Internals and Externals. Recall that a "false Internal" is one who has an Internal attitude (as reflected in a Locus of Control measure) but behaves like an External; and a "false External" has External attitudes but behaves like an Internal. "Behavior" here refers to conservative versus risky risk-taking in terms of mean Ps and mean distance. We complicated the matter by having two measures of subjects' attitudes and two situations in which to measure risk-taking behavior. Table 10 helps to point out the comparisons. Our $I_B - I_{B \text{CPT}}$'s could be called "true Internals" in the chance situation, but "false Internals" in the skill situation because they behaved like Externals there. Our $I_B - E_{B \text{CPT}}$ group was "true External" from the CPT point of view, but "false Internal" from the Bialer point of view. This was true in both chance
and skill. Our \( E_{b \cdot c} \)'s were "true External" in every case. Finally, our \( E_{b \cdot c} \)'s were "true Internals" from the CPT point of view, but "false Externals" from the Bialer point of view.

Note that in terms of relative risk-taking behavior, psychological situation affected the \( I_{b \cdot c} \) group alone. All other groups behaved consistently across chance and skill situations. This provides further support for the idea that Locus of Control is not only "a hypothetical construct to account for . . . response variations in specified situations" (Rotter et al., 1962, p. 499), but also a personality variable.

It is also interesting to note that if we compare CPT and risk-taking with Bialer and risk-taking, then the CPT "fits" with risk-taking behavior in seven out of eight cases, while Bialer fits in only three of the eight cases.

**Social Class Results**

It should be noted that the lack of direct relationship between social class and Locus of Control (\( r's = .10 \) and .07 for Bialer and CPT, respectively) is contrary to several previous studies which found significant correlations between I-E and socio-economic status (for example, Battle, 1962; Franklin, 1963; and Graves, 1961). If our Middle-Low class dichotomy was valid, this suggests that social class (as reflected in house type and parents' occupation) per se is not a
strong determinant of Locus of Control - at least not in Negro boys. Even though these variables were independent in our subjects, there was a tendency for Internals and Middles to behave one way and for Externals and Lows to behave another - especially in the skill situation. This suggests that knowing something about subjects' social class should add to our ability to predict their risk-taking behavior. In light of our lack of a more heterogeneous sample with respect to social class, one wonders whether comparing lower with truly middle or upper-class subjects might highlight the differences between these groups in relation to their risk-taking behavior. It would be especially interesting to see 1) whether the lack of relationship between social class and Locus of Control would be maintained, and 2) whether Middles and Lows would differ in the chance risk-taking situation as well as in the skill risk-taking situation.

Let us now examine the interaction trends between Locus of Control and social class and compare these to the Bialer x CPT trends discussed above. Again, Table 10 is helpful in visualizing these comparisons:

1. Middle Class Internals behaved like $E^B - I^CPT$'s (more conservative on both chance and skill);

2. Low Class Internals behaved like $I^B - I^CPT$'s (more conservative on chance, more risky on skill);

3. Low Class Externals behaved like $I^B - E^CPT$'s and $E^B - E^CPT$'s
(more risky on both chance and skill; and

4. Middle Class Externals (unlike any Bialer x CPT group) behaved more risky on chance and more conservative on skill.

Most of these differences were due to the fact that $I_{CPT}$'s always behaved more conservatively than $E_{CPT}$'s in chance, and Middles always behaved more conservatively than Lows in skill. Another way to state this is the following: a) in the chance situation, subjects who felt that what happens to them is a matter of fate or luck took greater risks than those who believed they could exert some control over what happened to them - regardless of social class; and b) in the skill situation, subjects who live in an environment in which positive reinforcement is likely to be denied took greater risks than those whose environment provides positive reinforcements - regardless of Locus of Control. Especially in the skill situation, however, knowledge of Bialer, CPT and social class categories can increase our ability to predict risk-taking behavior.

B. Comparisons with Previous Research

We have mentioned how many of our findings regarding relationships among independent variables were different from some of the previous studies, especially Battle (1962). Now we must compare our risk-taking results with the two studies which stimulated the present one (Liverant and Scodel, 1960 and Lefcourt, 1965).
Up until now we have talked about "conservative" and "risky" in terms of mean Ps and mean distance. While this was helpful in understanding the differences between our Locus of Control and social class groups, this emphasis may be somewhat misleading - especially when comparing our results to previous studies. We must now look at our risk-taking results, including variability measures, and then compare with previous research.

The "conventional" notion regarding conservative versus risky risk-taking behavior is based on the experiments of Liverant and Scodel and Lefcourt, both of which involved chance situations. The idea is that a chance situation is one in which the individual's skill has nothing to do with outcome. Since Internals are oriented toward using their own skill to influence or control outcome, they should try to assure themselves of this control by using a strategy which maximizes the number of favorable outcomes (minimize risk). They should do this by choosing bets which objectively should occur more often (even though they pay less) and by being more restrictive (less variable) in their bet choices. This is what is meant by a "cautious and planned selection of probabilities" (Liverant and Scodel, p. 59). By the same token, Externals do not feel they can control event outcomes, so they should ignore objective probabilities and select bets on the basis of hunches or "outcomes of previous trials". Thus Externals should vary more than Internals, both quantitatively (frequency and magnitude
of shifts) and qualitatively (unusual shifts).

A word of explanation regarding unusual shifts might be appropriate. Since Externals perceive each event as independent, they should not vary their expectation of outcome with previous outcomes. Thus, the External should not use feedback as much as the Internal, and the External should take more unusual shifts (Lefcourt, p. 768).

We noted earlier that in our data, relatively conservative mean Ps or mean distance correlated with greater variability (and deviation) scores. This finding is the reverse of the conventional notion that a cautious and planned selection of probabilities involves restriction in choice of bets. Our hypotheses were formulated within this frame of reference, and thus our variability results were often in the opposite direction from our hypotheses.

We found that using CPT to measure Locus of Control, the Liverant and Scodel predictions held true with respect to mean Ps but not with respect to variability. Even the mean Ps and mean distance part was only true in a relative sense. Actually our Internals did not show a conservative strategy, but they did behave more conservatively than Externals in terms of higher mean Ps. With regard to shifting, Internals certainly did not show a more stable and planned strategy than Externals. They shifted more (number, magnitude, and unusual shifts) in both chance and skill situations. One could even say that if Liverant and Scodel are correct in arguing that greater variability indicates lack
of strategy, then our Externals showed more strategic behavior than our Internals (and Lows more than Middles in skill).

The point here is that it is misleading to emphasize the more conservative behavior of our Internals (and Middles in the skill condition). Actually, all of our groups preferred risky approaches, especially in the skill situation. This was true of both mean Ps and variability. Internals were less risky than Externals (and Middles were less risky than Lows in the skill situation), and this was only true in terms of mean Ps and mean distance. Thus, it appears that the behavior of Internals and Middles was not really a matter of "cautious and planned selection of bets" or "greater use of betting strategies." Another way to say this is that Internals and Middles were not necessarily more "success striving", but they were less "failure avoidant" than Externals and Lows.

Let us compare our data to the data of Liverant and Scodel and Lefcourt in order to get an idea of the differences. Since they used only a chance condition, we shall use our chance data for the comparison. Figure 5 indicates that the subjects in both of the previous studies preferred bets of high to intermediate Ps (Liverant and Scodel mean Ps = .54; Lefcourt mean Ps = .61). Our subjects preferred a mean Ps in their chance game that was riskier than both of these (mean Ps = .42). Like Liverant and Scodel's Internals, our Internals chose a higher mean Ps than Externals; however, compared to previous
Frequency of Bets Taken at Various Ps Levels for Liverant and Scodel's Subjects, Lefcourt's Subjects, and Our Subjects in the Chance Condition (curves smoothed)

- Our subjects
- Liverant and Scodel's subjects
- Lefcourt's Subjects

Above the line - Liverant and Scodel's and Lefcourt's 7 Ps Levels
Below the line - Our 6 Ps Levels

a Based on 106 subjects, 10 bets/subject (1060 bets)
b Based on 54 subjects, 30 bets/subject (1620 bets)
c Based on 60 subjects, 30 bets/subject (1800 bets)
studies our subjects did not really employ strategies which represent attempts to maximize success. In an absolute way, all of our subjects tended to favor the riskier bets, but Externals favored even riskier ones than Internals. Fortunately, we took this into consideration when formulating our hypotheses in relative rather than absolute terms.

How can we account for these differences in results? There appear to be two kinds of explanations. We could argue that the relationship between our variability and mean Ps data was mainly a function of the low mean Ps (and high mean distance) of our subjects, or we could argue that our results are due to the fact that we used different subjects, measures and experimental tasks.

The first is a post hoc explanation similar to the argument concerning deviation scores. It claims that our number and magnitude of shift scores do not really reflect subjects' risk-taking strategies, but are instead an artifact of the low overall mean Ps (and higher mean distance) our subjects preferred. Thus, for example, if a subject had a more conservative mean Ps level (say .4 or .5), he also had more room to vary his choices (bets or shots) in each direction. In other words, he could take higher or lower Ps or he could stand nearer or further from the target. If, however, he preferred a mean Ps of .2 or .3, he would have less room to vary in the direction of lower Ps, and he could not shift to higher Ps levels too often without raising
his mean Ps. This could account for the relationship between mean Ps and number and magnitude of shifts in our data, but it is more pertinent to the skill condition than the chance condition because the mean Ps for skill was more extreme (.37) than the mean Ps for chance (.42).

Recall that our unusual shifts score was independent of frequency or magnitude of shifts. It should reflect the way in which subjects used feedback. Like the other variability scores, unusual shifts also failed to relate to Locus of Control or social class as predicted. As a matter of fact, there was a slight tendency for I_CPT's to shift unusually more than E_CPT's in both chance and skill. In other words, I_CPT's operated according to the gambler's fallacy as much as or more than E_CPT's.

Lefcourt argues that Internals should have fewer unusual shifts because they should vary their expectations of outcomes with previous outcomes. The question is - vary how? If successful at a low Ps bet or shot, should the subject remain there and try again or should he move to a lower Ps level? To check further into this, we computed a "use of feedback" score, which considered direction and magnitude of shift as well as response to success versus failure (See Appendix O). Although few of the differences were statistically significant, Externals tended to use feedback more than Internals. It is interesting to note that Middles, who tended to shift unusually more
than Lows in the skill situation, also tended to use feedback less than
Lows in the skill situation. Lows, who tended to shift unusually more
than Middles in the chance situation, also tended to use feedback less
than Middles in the chance situation.

We might also add that there were significant correlations be-
tween IQ and frequency of shifting ($r = .21, p < .05$) and between IQ
and proportion of unusual shifting ($r = .25, p < .05$). This is contrary
to Scodel (1959) and Liverant and Scodel (1960) who found a tendency
for IQ to vary with less variability. Thus, our brighter subjects tended
to use feedback, but they did not fix on a particular strategy and
stick to it.

We chose to emphasize the mean P$s and mean distance aspects
of risk-taking behavior. With our particular subjects, measures,
and tasks, those who preferred a more risky approach were slightly
more restricted in their choice of bets than those who preferred a
relatively less risky approach. In addition to shifting more frequently,
the latter subjects behaved as if they were making their choices rather
randomly in terms of not being tied to previous outcomes. This could
be a function of perceiving each event as independent of the preceeding
ones, or it might reflect a desire to sample many different stimuli.
In this sense, the Internals (and Middles in skill) were less constricted
in their risk-taking behavior than Externals (and Lows).

This, however, can also be misleading, for we must keep in mind
that the mean number of shifts taken by our subjects was quite high (out of a possibility of nine, our subjects averaged 7.3 shifts in the chance situation and 6.7 shifts in the skill situation). In Lefcourt's terms, our Externals and Lows behaved as if they felt powerless to control the outcomes of their behavior. In Liverant and Scodel's terms, Externals and Lows acted as though they believed in luck more than their own ability to control events. With respect to mean Ps and mean distance, this was true in both relative and absolute ways. It is not correct to say that our Internals and Middles behaved as if they felt they could control outcomes (in an absolute sense); however, they did this more than Externals and Lows. Thus, behaviorally we should stress Externals' and Lows' feelings of powerlessness rather than Internals' and Middles' feelings of "powerlessness".

If Lefcourt is correct, our powerless subjects adopted "less acceptable but more risky methods for gaining certain goals" (1965, p. 769). Our Lows behaved more like Externals than did our Middles in the skill condition. This agrees with Lefcourt's results. Lows are supposedly deprived of opportunities to come to perceive reinforcements as obtainable through conventional channels - more so than Middles. Thus, in the skill situation, Lows played the "long shots". They did not, however, behave more like Internals in the chance condition. In other words they did not "see success as more controllable" like Lefcourt's Negro subjects. Recall that Lefcourt's hypothesis was
based on Littig's idea that subjects who have a low expectation that participation in skill leads to success (his Negroes and our Lows) should become more "involved" in chance situations. The question is - involved how? Does a cautious, conservative selection of bets indicate involvement more than a riskier approach? This may not be true for our subjects and our tasks. In any case, the semantics become problematic when we begin using words like "involved" and "more or less acceptable".

C. Major Findings Reviewed

Before concluding with suggestions for future research, a brief summary of the major findings will be presented.

Essentially, what we did was to examine personality, sociological, situational, and behavioral counterparts of the Locus of Control or I-E construct. We administered two measures of Locus of Control. One was "External-like" in that it restricted both stimuli and responses and thus externally "controlled" subjects' behavior. The other was "Internal-like" in that it presented less specific stimuli and allowed subjects considerable freedom of response.

Using house type and parents' occupation as indices of social class, we separated subjects into "Middle" and "Low" class. If social circumstances affect social learning, then these may be conceived of as roughly analogous to Internal and External environments - or at least
environments which stimulate versus inhibit expectancies that one is capable of determining one's own fate.

We created two different risk-taking situations. In the chance game, outcome was determined entirely by forces external to the individual. In the skill game, outcome depended upon the subject's own skill.

Finally, we analyzed subjects' risk-taking behavior according to an Internal-External continuum. Theoretically, if one feels one can control behavior-outcome sequences, one should select bets or shots in a cautious and planned manner. In one feels powerless or unable to control what happens to oneself, one should ignore objective probabilities and play hunches and/or the gambler's fallacy.

There are many ways to interpret our risk-taking findings. We chose to emphasize mean Ps and mean distance, thereby relegating deviation and variability scores to a secondary status. We felt it was important to stress the relativity of our findings, especially those regarding "conservative" and "risky" strategies. Compared to previous studies, all of our groups of subjects preferred a risky mean Ps and mean distance and they shifted a lot. Externals and Lows played the long shots and were slightly restrictive in their shifting behavior. Internals and Middles preferred somewhat less risky bets and were not restrictive in their shifting behavior.

We found that knowing whether subjects are 1) Internals or
Externals, 2) Middles or Lows, and 3) whether they are involved in a chance- or skill-determined situation, all increased our ability to predict their risk-taking behavior. If we examine our variables independently, we find that the CPT was the only measure sensitive enough to predict risk-taking in the chance situation. Both CPT and social class were able to predict skill risk-taking behavior. The psychological situation was also quite important; however, comparisons between chance and skill were limited by the experimental design.

One of the most interesting findings was the lack of significant relationship between the two measures of Locus of Control. They appeared to be measuring two different things - or at least different levels of the construct. The thought sampling or "projective" measure was considerably more successful in predicting risk-taking behavior than the questionnaire measure.

When the psychological situation was analogous to powerlessness or External control, the CPT was the only measure that predicted risk-taking. When the psychological situation was such as to encourage the expectation that one's own behavior can control reinforcements, social class was also successful in predicting risk-taking behavior. There were interesting interactions between Locus of Control and social class in the skill condition but very few in the chance condition.
D. Suggestions for Future Research

We have already mentioned that in view of our social class results, it might be profitable to use more heterogeneous subjects in terms of social class, race, etc. Along these lines, it would also be interesting to examine sex and age differences.

In order to discover more about effects of the psychological situation, it would be interesting to use one risk-taking task and establish sets for chance versus skill by using instructions rather than actually different tasks. In addition to allowing for chance versus skill comparisons, this would also make it easy to standardize reward across situations. One question which would be interesting to study here is - what are the effects of using concrete rewards (like money or cigarettes) versus symbolic rewards (like points or praise) versus no extrinsic reward at all?

Our results regarding Externals and Lows being quite extreme risk-takers is analogous to Atkinson et al.'s (1960) results. They found that differences between high and low need achievers on risk-taking was due to the Lows preferring extreme risks, not the highs preferring moderate risks. While we had no success with the moderate versus extreme approach, we were able to use the conservative versus risky approach in our study. This seems just the opposite of the studies involving achievement motivation and risk-taking. Most of these studies involve skill situations because there is no achievement incentive in a
chance situation, even though the reward is the same. Thus, it would be interesting to combine achievement motivation and Locus of Control data and compare risk-taking in both chance and skill situations.

Finally, we found several interesting differences between questionnaire and thought sampling measures of Locus of Control, many of which were quite different from Battle's (1962) results. This might be an extremely interesting area to pursue. One might attempt to score the CPT for locus of causality (Origin-Pawn), or one might want to experiment with different directions for the CPT. At any rate, we have considerable evidence for recommending that future research employ more than just questionnaire measures of I-E. Not only is the Locus of Control construct sensitive to both personality and situational factors, but it is also sensitive to different approaches to measurement.
REFERENCES


Battle, Esther and Rotter, J. B. Children's feelings of personal control as related to social class and ethnic group, Journal of Personality, 1963, 31, 482-490.


Hall, O. Review of Warner et al., 1949, American Journal of Sociology, LVI, 1951, 368.


James, W. H. and Rotter, J. B. Partial and 100% reinforcement under chance and skill conditions, Journal of Experimental Psychology, 1958, 55, 397-403.


Lefcourt, H. M. *The effect of reference group upon negroes' task persistence in a biracial competitive game*, *Journal of Personality and Social Psychology*, 1965, 1, 668-671. (b)


Mack, R. Housing as an index of social class. Social Forces, 1951, 29, 391-400.


APPENDIX A

Bioler Questionnaire

All answers are underlined to indicate the Internal response. This is followed by the item reliability coefficient in parenthesis, i.e. correlation of each item with the total score.

Total score = total number of items answered in the Internal direction.

NAME: ____________________________ AGE: _________ SEX: ______
GRADE: ____________ SCHOOL: ____________ TEACHER: ______

DIRECTIONS

The questions below have no right or wrong answers. Different people answer them differently. A "YES" answer is no better than a "NO" answer. The important thing is to answer them as you think they should be answered.

If you think a question should be answered "YES", or mostly "YES", draw a circle around the "YES" following that question. If you think a question should be answered "NO", or mostly "NO", draw a circle around the "NO" following that question. Answer every question as you think it should be answered.

1. When somebody gets mad at you, do you usually feel that there is nothing you can do about it?  
   YES NO (.31)

2. Do you really believe that a person can be whatever he wants to be?  
   YES NO (.55)

3. When people are mean to you, could it be because you did something to make them be mean?  
   YES NO (.34)

4. Do you usually make up your mind about something without asking someone first?  
   YES NO (.23)
APPENDIX A (continued)

5. Can you do anything about what is going to happen tomorrow?  YES NO (.26)

6. When people are good to you, is it usually because you did something to make them be good?  YES NO (.41)

7. Can you ever make other people do things you want them to do?  YES

8. Do you ever think that people your age can change things that are happening in the world?  YES NO (.46)

9. If another child was going to hit you, could you do anything about it?  YES NO (.55)

10. Can a person your age ever have his own way?  YES NO (.53)

11. Is it hard for you to know why some people do certain things?  YES NO (.23)

12. When someone is nice to you, is it because you did the right things?  YES NO (.37)

13. Can you ever try to be friends with another kid, even if he doesn't want to?  YES NO (.64)

14. Does it ever help any to think about what you will be when you grow up?  YES NO (.37)

15. When someone gets mad at you, can you usually do something to make him your friend again?  YES NO (.34)

16. Can people your age ever have anything to say about where they are going to live?  YES NO (.41)

17. When you get in an argument, is it sometimes your fault?  YES NO (.37)

18. When nice things happen to you, is it only good luck?  YES NO (.62)
APPENDIX A (continued)

19. Do you often feel you get punished when you don't deserve it?  YES NO (.31)

20. Will people usually do things for you if you ask them?  YES NO (.37)

21. Do you believe a kid can usually be whatever he wants to be when he grows up?  YES NO (.35)

22. When bad things happen to you, is it usually someone else's fault?  YES NO (.33)

23. Can you ever know for sure why some people do certain things?  YES NO (.42)
APPENDIX B

Directions for Children's Picture Test (cartoons)

1) Have Ss put first and last names on cover of cartoon booklet.

2) Read directions on cover and have Ss read along silently.

3) Let's all turn to cartoon A on the first page. As you can see, the person on the left (point) is saying "How come you were finally allowed to stay up later?" You are to pretend you are the person on the right and write or print in the empty space what you would say. Don't worry about staying inside the lines; you may go over if you need to. Now remember there are no right or wrong answers. I'll give you one or two minutes to write or print each cartoon. Please do not turn the pages until I tell you to. Are there any questions? O.K., let's all do cartoon A now. (Wait 1-2 minutes. See if Ss are writing something.) Any questions? O.K., then let's turn to the next cartoon. The person on the left is saying "......". Now write or print here what you would say in this situation. (Read for each one.)

<table>
<thead>
<tr>
<th>Item</th>
<th>Correlation with total score minus item</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.32</td>
</tr>
<tr>
<td>2</td>
<td>.49</td>
</tr>
<tr>
<td>3</td>
<td>.25</td>
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<td>.22</td>
</tr>
<tr>
<td>5</td>
<td>.39</td>
</tr>
<tr>
<td>6</td>
<td>.32</td>
</tr>
</tbody>
</table>

- 175 -
APPENDIX B (continued)

DIRECTIONS

THIS BOOKLET CONTAINS SIX CARTOONS. THERE IS ONE CARTOON ON EACH PAGE. IN EACH CARTOON, ONE PERSON IS SAYING SOMETHING TO ANOTHER PERSON. YOU ARE TO WRITE OR PRINT IN THE EMPTY SPACE ABOVE THE SECOND PERSON WHAT YOU WOULD SAY IF YOU WERE THAT PERSON. DON'T WRITE IN FUNNY THINGS, JUST WHAT YOU WOULD SAY. THERE ARE NO RIGHT OR WRONG ANSWERS TO ANY OF THESE CARTOONS. WHAT WE WANT TO KNOW IS WHAT YOU WOULD SAY IN EACH OF THESE SITUATIONS.
How come you were finally allowed to stay up later?
HOW COME YOU Didn't GET WHAT YOU WANTED FOR CHRISTMAS?
WHY IS SHE ALWAYS HURTING HERSELF?
When you grow up do you think you could be anything you wanted?
WHENEVER
YOU'RE
INVOLVED
SOMETHING
GOES WRONG!
That's the third game we've lost this year!
WHY DOES HER MOTHER ALWAYS HOLLER AT HER?
APPENDIX C

CPT Scoring Manual

From Battle, Esther & Rotter, J. B. Children's feelings of personal control as related to social class and ethnic group. J. Personal. 1963, 31, 482-490

Children's Picture Test of Internal External Control

General Scoring Directions

Esther Battle

Neutral responses

Three types of responses are included in this category:

1) Those in which the respondent refuses to answer or says he doesn't know an answer.

2) A double-barreled answer is given, half internal, the other half external so that the two cancel each other. The response is scored "3" regardless of the weight of either of the two answers separately. (e.g. Why does your mother holler? . . . Either the mother is cross or the kid is bad.)

3) Those in which the respondent has clearly misunderstood the question or has given an irrelevant answer (in terms of the scoring criteria). (e.g. When you're involved something's wrong . . . I'm sorry . . . that's not true.)

Internal responses

Internal responses are those in which the respondent implies that the rewards or punishments meted out are a result of what the protagonist has done. They usually express feelings of power, refer to personal qualities, imply that the person could have done something to change the situation or suggest that the reward or punishment is due to something they have done.

- 184 -
APPENDIX C (continued)

Responses range from scores of 0-2 inclusive, with -0 indicating the most 'internal' response; a score of 1 less extreme and a weight of 2 even more neutral. If two internal responses are given, the average of the two is used for that question.

A. Internal responses scored 0 are extreme statements of internality. They are frequently given:

1) When the response seems to go against the item pull. (e.g. Didn't get Christmas gift? . . . I didn't earn it.)

2) When the group failing is attributed by the respondent to himself. (e.g. Third game we've lost . . . because of me.)

3) When the speaker has a strong sense of power. (e.g. Didn't get Christmas gift? . . . You never get what you want unless you buy it yourself.)

B. Internal responses scored 1 are the most moderate allocation of "self control". They usually refer to:

1) situations in which the person feels the response to him is on the basis of generally good or bad behavior. (Didn't get Christmas gift? . . . I was bad).

2) instances in which he emphasized the fact that his behavior is purposeful. (e.g. Why is she hurting herself . . . She wants to stay home.)

3) cases in which the child attributes his success and failure to practice, or lack of it. (e.g. Third game lost . . . we need more practice.)

4) situations in which the child assumes general responsibility for the outcome. (e.g. why mother hollers . . . she deserves it.)

C. Internal responses scored 2 are given:

1) when the person, while attributing failure to himself, blames it on some characteristic over which he has only a little control. (e.g. why is she hurting herself . . . too athletic.)
APPENDIX C (continued)

2) where there is a combination of personal responsibility and parental control (with emphasis on the former). (e.g. Why mother hollers . . . she (mother) can't trust her . . . i.e. the child is untrustworthy).

3) where the person's own efforts are effective only in combination with someone else. (e.g. Whenever you're involved . . . I'll have to ask for help.)

4) where the person is in error according to another's judgment (e.g. Why mother hollers . . . her mother thinks she does things wrong.)

External responses

A response is scored as 'external' when the person attributes his success or failure to luck, fate, chance, hope or faith; when he blames the trouble on others in his environment and when he feels that failure is due to 'inborn characteristics', hereditary factors or stages in his development which will pass in time. Also scored as external are cases in which he feels his failure is due to others' weaknesses or caprice. These are responses which indicate that the person is acting without choice or because of someone else's decision or power.

Responses range from scores of 4-6 inclusive, with a score of 4 given to the most neutral externally weighted response, a score of 5 for a 'purer' external response and 6 indicating the most extreme. If two external responses are given, the average of the two is used as a score for that question.

A. External responses scored 4 are instances:

1) in which the emphasis is on the power of another although the speaker is, in some way, responsible (e.g. whenever you're involved . . . you ask me to do impossible things.)

2) where the fault lies in another although it is provoked (Why mother hollers . . . she's mad, but something made her mad.)

3) where the person hopes or has faith that the future will bring success. (Third game lost . . . I hope we win the next one.)
APPENDIX C (continued)

4) where failure is due to lack of opportunity although the individual could make his own opportunity. (e.g. Can be anything want when grow up . . . mightn't get the right training/experience.)

B. External responses scored 5 are given:

1) where the reward or punishment comes through characteristics of the other. (why mother hollers . . . she's mean.)

2) where failure is due to personal attributes over which the individual has no control (why hurt herself . . . she's too tall.)

3) where the decision is attributed to another irrespective of the speaker. (didn't get Christmas gift . . . my parents decided not to give it.)

4) where there is an unalterable lack of opportunity. (can be anything you want? . . . the job may be filled.)

5) in cases of luck (third game lost . . . must be bad luck.)

6) where the person does something without choice (third game lost . . . we couldn't help it.)

C. External responses scored 6 are extreme. They are given:

1) when the response is contrary to item pull (be anything you want? . . . if you're lucky enough to meet the right people.)

2) where a personal characteristic is explained by group attributes. (Whenever you're involved . . . it's the fault of the others involved.)

Specific Scoring

ITEM 1: How come you didn't get what you wanted for Christmas?

Score

5 my parents couldn't afford it / my parents felt I shouldn't have
APPENDIX C (continued)

it/ too expensive / parents thought I didn't need it

4 my parents convinced me that I should wait until my birthday / can't have everything you want

3 I got something else better (similar) / you didn't say you wanted it or the parents didn't think it's good

2 I wasn't very good so my parents didn't get it

1 I wasn't good / I didn't say I wanted it / I didn't work for it

0 You never get what you want unless you're serious about it / . . . unless you buy it yourself

ITEM 2: Why is she always hurting herself?

5 she's grown too fast and can't control herself / just her luck / tall and clumsy / she can't help it

4 not enough supervision

3 she isn't

2 because she's too athletic / maybe there's been trouble in the family / because she's clumsy - question: if this means awkward score 2, if it means careless score 1. / she does things that will hurt her

1 not careful / to get attention / she tries to do things that are too hard / wants to use crutches

ITEM 3: When you grow up do you think you could be anything you wanted?

6 if you're lucky enough to meet the right people

5 no / no, I'm good in some things, not others / I'm not that smart / the job might be filled when I want it
APPENDIX C (continued)

4 you mightn't get the right training / I haven't had enough experience / if you wanted to be a robber your mother wouldn't let you / might not have enough money to get the training

3 I don't know what I want to be / I don't know / I could be, but not the best

2 Yes, with the right training

1 Yes / yes, if I tried hard / you have to work, you just can't be

ITEM 4: Whenever you're involved something goes wrong.

6 it's the other people's fault

5 I can't help it / I'm just bad luck / coincidence / my luck / she's a jinx

4 it isn't my fault / cuz you ask me to do things I can't do

3 no / yes / I won't be involved anymore / I'm sorry / not true / it wasn't all my fault

2 she'll have to ask for help to change / I get nervous and make mistakes / I can't do things right (can't do some things right)

1 I'm careless / I'll try to change (improve)

0 It's all my fault

ITEM 5: That's the third game we've lost this year.

5 bad luck / can't win them all / we couldn't help it

4 I hope we win the next one / I couldn't help it / maybe we'll win the next

3 too bad / we tried hard / that's the third game we've played / it's not my fault / we'll try again
APPENDIX C (continued)

2 you must have pitched / some boys on the team don't care / they're better than we are / our coach is weak / we tried as hard as we could

1 we ought to practice more / the team isn't strong enough

0 I know, but I couldn't pitch

ITEM 6: Why does her mother always holler at her?

5 her mother is evil / the girl is kind of deaf / mother is mean

4 she couldn't do anything to please her mother

3 she's not hollering / she wants her to be a good girl / she's trying to help her / the mother is mad but not without cause

2 she can't trust her / her mother thinks she does things wrong / her mother has to do it to make her listen, obey, etc.

1 she does things wrong / she doesn't obey / she deserved it / she doesn't listen
APPENDIX C (continued)

Norms: Children's Picture Test of Internal External Control - Esther Battle

Sample I: Esther Battle

Test Circumstances: 8th grade children from Columbus and Dayton, Ohio, public schools. Individual administration.

Inter-scorer reliability: .93

Internal-External Control Scores:

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<th>s.d.</th>
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<td>15.6</td>
<td>4.2</td>
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</tr>
<tr>
<td>Both</td>
<td>80</td>
<td>16.5</td>
<td>4.1</td>
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Sample II: Fels Research Institute - Crandall et al.

Test Circumstances: 9th grade children from Yellow Springs, Ohio, high school. Group administration.

Inter-scorer reliability: .90+

Internal-External Control Scores:

<table>
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<th>Gender</th>
<th>n</th>
<th>x</th>
<th>s.d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boys</td>
<td>40</td>
<td>16.3</td>
<td>4.8</td>
</tr>
<tr>
<td>Girls</td>
<td>30</td>
<td>16.3</td>
<td>3.8</td>
</tr>
<tr>
<td>Both</td>
<td>70</td>
<td>16.3</td>
<td>4.4</td>
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</tbody>
</table>
APPENDIX D

Warner's Socio-Economic Classification of Occupation*

Class 1:

Professionals - lawyers, doctors, dentists, engineers, judges, high-school superintendents, veterinarians, ministers (divinity school), chemists etc. with post-graduate training, architects.

Proprietors and Managers - Businesses valued at $75,000 and up.
Businessmen - Regional and divisional managers of large financial and industrial enterprises.

Clerks etc. - Certified public accountants.

Gentlemen farmers.

Class 2:

Professionals - high school teachers, trained nurses, chiropodists, chiropractors, undertakers, ministers (some training), newspaper editors, librarians (graduate).

Proprietors and Managers - Businesses valued at $20,000-$75,000.
Businessmen - Assistant managers and office and department managers of large businesses, assistants to executives, etc.

Clerks etc. - Accountants, salesmen of real estate, of insurance, postmasters.

Large farm owners, farm owners.

Class 3:

Professionals - Social workers, grade-school teachers, optometrists, librarians (not graduate), undertaker's assistants, ministers (no training).

Proprietors and Managers - Business valued at $5,000-$20,000.
Businessmen - All minor officials of business.

Clerks etc. - Auto salesmen, bank clerks and cashiers, postal clerks, secretaries to executives, supervisors of railroad, telephone, etc., justices of the peace.

Manual workers - contractors.

APPENDIX D (continued)

Class 4:

Proprietors and Managers - Businesses valued at $2,000-$5,000.
Clarks etc. - stenographers, bookkeepers, rural mail clerks,
    railroad ticket agents, sales people in dry goods stores,
    etc.
Manual workers - factory foremen, electricians, plumbers and
carpenters with own business, watchmakers.
Protective and Service Workers - dry cleaners, butchers, sheriffs,
    railroad engineers and conductors.

Class 5:

Proprietors and Managers - Businesses valued at $500-$2,000.
Clerks etc. - dime-store clerks, hardware salesmen, beauty oper-
    ators, telephone operators.
Protective and Service Workers - Barbers, firemen, butcher's
    apprentices, practical nurses, policemen, seamstresses,
    cooks in restaurant, bartender.
Tenant farmers.

Class 6:

Proprietors and Managers - Business valued at less than $500.
Manual Workers - Moulders, semi-skilled workers, assistants to
carpenter, etc.
Protective and Service Workers - Baggage men, night policemen
    and watchmen, taxi and truck drivers, gas station atten-
dants, waitresses in restaurant.
Small tenant farmers.

Class 7:

Manual Workers - Heavy labor, migrant work, odd-job men, miners.
Protective and Service Workers - Janitors, scrub-women, newsboys.
Migrant farm laborers.
APPENDIX E

Warner's House Type Scale*

1. Excellent houses:

This includes only houses which are very large single-family dwellings in good repair and surrounded by large lawns and yards which are landscaped and well cared for. These houses have an element of ostentation with respect to size, architectural style, and general condition of yards and lawns.

2. Very good houses:

Roughly, this includes all houses which do not quite measure up to the first category. The primary difference is one of size. They are slightly smaller, but still larger than utility demands for the average family.

3. Good houses:

In many cases they are only slightly larger than utility demands. They are more conventional and less ostentatious than the two higher categories.

4. Average houses:

One-and-a-half to two-story wood frame and brick single-family dwellings. Conventional style, with lawns well cared for but not landscaped.

5. Fair houses.

In general, this includes houses whose condition is not quite as good as those houses given a 4 rating. It also includes smaller houses in excellent condition.

APPENDIX E (continued)

6. Poor houses:

In this and the category below, size is less important than condition in determining evaluation. Houses in this category are badly run-down but have not deteriorated sufficiently that they cannot be repaired. They suffer from lack of care but do not have the profusion of debris which surrounds houses in the lowest category.

7. Very poor houses:

All houses which have deteriorated so far that they cannot be repaired. They are considered unhealthy and unsafe to live in. All buildings not originally intended for dwellings, shacks and over-crowded buildings. The halls and yards are littered with junk, and many have an extremely bad odor.
This is a game of chance. As you can see, this wheel has 8 different letters on it. They go from A to H. Each time I spin the pointer it lands on one of the letters, but we never know which letter it will land on. (Spin a few times.)

Now, I'll explain what you do. Each of you is going to make a bet before I spin the pointer each time. Now look here to see what bets you may select (payoff matrix). There are 6 different bets in all. In this one (1st on left), you choose one of the letters. It can be any one letter of the wheel (like F or B . . .). If the pointer lands on the letter you chose, then you win 40 points. Since there are 8 different letters and you only get to pick one, your chances of winning are 1 in 8.

If you choose this bet (2nd), you get to pick any 2 letters on the wheel. They can be any 2 letters you wish (like C and H or . . .). If the pointer lands on either of the 2 letters you chose, then you win 20 points. Since there are 8 letters and you chose 2 of them, your chances of winning are 2 in 8.

(Same for 3, 4, 5 and 6 - pointing each time.)

So there are 6 different bets you may select from. You may choose any one letter to try to win 40 points, . . ., or any 6 letters to try to win 7 points. As you may have figured out already, the ones at this end (left) are harder to win because you only get to choose 1 or 2 letters, but if the pointer lands on one of the letters you chose you win a lot of points. Of course if it doesn't land on one of the letters you chose, you get 0 points. The ones at this end (right) are easier to win because you get to choose many letters, but you don't get as many points for winning. The ones in the middle are kind of in between. Are there any questions so far? (Go through again if necessary.)

Before I pass out the boxes & papers for practice, I'll do one on the board. Each of you will get a little box. The plastic top is so that you can see through, and the slit in the side is for your little papers. The papers look just like the wheel up here. They have the same 8 letters on them. The first thing you do is decide which one of these choices you want to make. Then circle which letter(s) you
APPENDIX G (continued)

want to bet on. Finally you fill in the bottom part where it asks how many letters you chose, how many points you could win, and what your chances of winning are. Just for practice, let's all do the first one on the board. (Go through 1st bet. Then pass out boxes, 6 practice slips, and 1 points won slip.) Name on points won slip. Now when we begin the real thing, you'll each choose which bet you want to make, but for practice let's all do the second bet. That means you have to decide which 2 letters you want, circle them on your papers, fill in the bottom part, and then slip it into the box face up so that you can see it.

(Go through one example of each bet. Have Ss keep track of number of points won on separate sheet.) Are there any questions about what we're going to do? (Have Ss slip points won sheet into box, then pass out 10 circle and 1 points won sheets to each S).

O.K. practice is over. This really counts! Now we'll do the same thing 10 times, only each of you may now choose any bet you want each time. You may keep trying the same one or change to a different choice each time. Before I spin the pointer each time, you choose one of these, circle on your papers which letters you want to try, and then fill in the bottom part. Then slip the paper through the slot into the box. I'll spin the pointer and you can see if you won. If the pointer lands on one of the letters you chose, write down how many points you won for that spin. If the pointer does not land on a letter you chose, write down 0 for that spin. Now remember you may choose any of the 6 bets you want.

<table>
<thead>
<tr>
<th>YOU CHOOSE</th>
<th>ANY 1 Letter</th>
<th>ANY 2 Letters</th>
<th>ANY 3 Letters</th>
<th>ANY 4 Letters</th>
<th>ANY 5 Letters</th>
<th>ANY 6 Letters</th>
</tr>
</thead>
<tbody>
<tr>
<td>POINTS YOU WIN</td>
<td>40</td>
<td>20</td>
<td>13</td>
<td>10</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>CHANCES OF WINNING</td>
<td>1 in 8</td>
<td>2 in 8</td>
<td>3 in 8</td>
<td>4 in 8</td>
<td>5 in 8</td>
<td>6 in 8</td>
</tr>
</tbody>
</table>
I chose ________ letters
I could win ________ points
My chances are ________ in 8
APPENDIX H

Directions for Skill Game

This is a game of skill. The object is to throw the bean bag into the basket. As you can see there are 6 different distances to throw from. They are lettered A through F. Before I explain what you are going to do, I will let you take one throw from each distance just so you can get the feel of it. (Let S throw once from each distance in the order B, D, F, A, C, E).

Now you are going to take a whole bunch of practice throws, and during your practice I am going to keep track of how well you do. So when you are finished with your practice, we will know just how good you are at each of the 6 distances. Actually, you are going to get 8 tries from each distance, so when you finish your practice we will know how many out of 8 you can get in at each distance. (Have S throw 48 times, 8 blocks of 6 throws each, to determine his own probability of success at each distance. He throws from each of the 6 distances in the order B, D, F, A, C, E).

Okay now let's see how well you did from each distance. (Show S his frequency graph and have him help you lay out the appropriate placards next to each distance). So your chances of getting the bean bag in the basket from distance F is _________ in 8. If you get it in from there you win _________ points, and if you miss you get 0. (Repeat for each distance) These distances (point to near ones) were the easiest for you. So your chances are real good, but the points are small. These distances (point to furtherest ones) were the hardest for you. Your chances are slim, but if you get it in the basket you get a lot of points. And these distances (point to middle ones) are kind of in between. They were harder for you than the near ones, but you get more points. They were easier for you than the far ones, but you don't get as many points. Do you understand this part? Okay so if we put all of this together, what does it mean? Well, it means that your chances are good at the near distances but the points are small; your chances are slim at the farther distances but you could get a lot of points; and the middle ones are kind of in between.

Now practice is over. This part really counts. You are going to get 10 throws, only now you get to choose distances that you want to throw from each time. You may choose any distance you wish.
Here is how it works: You choose a distance, throw the bean bag, and if it goes in you get the number of points that it says on the floor next to that distance. If you miss you get 0. Then you can move in, stay right where you are, or move out for your next throw. Any questions? Don't forget you may change distances or stay at the same distance as often as you wish. I will keep track of how many points you get on the board. For the first throw, which distance would you like to try? (Have S call out the letter of the distance he wishes to try, what his chances are at that distance, and how many points he could win).

**Diameter of Basket = 13 inches**

<table>
<thead>
<tr>
<th>Distances</th>
<th>Feet from Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>4.0</td>
</tr>
<tr>
<td>B</td>
<td>6.5</td>
</tr>
<tr>
<td>C</td>
<td>9.0</td>
</tr>
<tr>
<td>D</td>
<td>11.5</td>
</tr>
<tr>
<td>E</td>
<td>14.2</td>
</tr>
<tr>
<td>F</td>
<td>17.0</td>
</tr>
</tbody>
</table>
APPENDIX H (continued)

Record Form for Skill Game

NAME

NUMBER

IN BASKET

DISTANCES

PRACTICE BLOCKS

Trial | Distance | Points
--- | --- | ---
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.
APPENDIX I

Bialer, CPT, Social Class, and IQ Data

Bialer:

\[ \bar{X} = 12.6; \text{ S. D.} = 2.3; \text{ range} = 8-18 \]

<table>
<thead>
<tr>
<th>Group</th>
<th>N&lt;sup&gt;a&lt;/sup&gt;</th>
<th>N&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal</td>
<td>51</td>
<td>46</td>
<td>13-18</td>
</tr>
<tr>
<td>External</td>
<td>55</td>
<td>44</td>
<td>8-12</td>
</tr>
</tbody>
</table>

<sup>a</sup> based on 106 subjects
<sup>b</sup> based on 90 subjects

Carpenter's (1967) Data for 5-7th graders:

\[ \bar{X} = 13.0; \text{ range} = 6-20 \]

CPT:

\[ \bar{X} = 15.6; \text{ S. D.} = 3.6; \text{ range} = 6-25 \]

<table>
<thead>
<tr>
<th>Group</th>
<th>N&lt;sup&gt;a&lt;/sup&gt;</th>
<th>N&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal</td>
<td>47</td>
<td>39</td>
<td>6-15</td>
</tr>
<tr>
<td>External</td>
<td>59</td>
<td>51</td>
<td>16-25</td>
</tr>
</tbody>
</table>

<sup>a</sup> based on 106 subjects
<sup>b</sup> based on 90 subjects

Battle's (1962) Data:

**8th grade boys - individual administration:**

\[ \bar{X} = 15.6; \text{ S. D.} = 4.2 \]

**9th grade boys - group administration:**

\[ \bar{X} = 16.3; \text{ S. D.} = 4.8 \]
APPENDIX I (continued)

Social Class:

<table>
<thead>
<tr>
<th>Group</th>
<th>N&lt;sup&gt;a&lt;/sup&gt;</th>
<th>N&lt;sup&gt;b&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Middle</td>
<td>40</td>
<td>36</td>
</tr>
<tr>
<td>Low</td>
<td>66</td>
<td>54</td>
</tr>
</tbody>
</table>

<sup>a</sup> based on 106 subjects  
<sup>b</sup> based on 90 subjects

IQ: Test used - Lorge-Thorndike  
\( \overline{X} = 92.1; \) S. D. = 11.1; range = 53-118

Product-Moment Correlations Among Social Class† Occupation,  
House Type, Number of Parents in Home‡ and IQ

<table>
<thead>
<tr>
<th></th>
<th>Occupation</th>
<th>House Type</th>
<th>Parents in Home</th>
<th>IQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Class</td>
<td>.36***</td>
<td>.77***</td>
<td>.16*</td>
<td>-.21*</td>
</tr>
<tr>
<td>Occupation</td>
<td>---</td>
<td>.22*</td>
<td>.26**</td>
<td>-.26**</td>
</tr>
<tr>
<td>House Type</td>
<td>---</td>
<td>---</td>
<td>.25**</td>
<td>-.24**</td>
</tr>
<tr>
<td>Parents in Home</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>-.26**</td>
</tr>
</tbody>
</table>

† based on dichotomizing subjects into Middles (score of 1) and Lows (score of 2)

‡ based on dichotomizing subjects into those with both parents in the home (score of 1) and those with one or more parents absent (score of 2)

* \( p<.05 \)

** \( p<.01 \)

*** \( p<.001 \)
APPENDIX J

CPT Scores for Middles and Lows --- Battle's Data vs. Present Study

<table>
<thead>
<tr>
<th>Social Class</th>
<th>Battle's Data&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Our Data&lt;sup&gt;b&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Mean CPT Score</td>
</tr>
<tr>
<td>Middle</td>
<td>16</td>
<td>15.8</td>
</tr>
<tr>
<td>Low</td>
<td>23</td>
<td>18.3</td>
</tr>
</tbody>
</table>

<sup>a</sup> 6th and 8th grade Negroes

<sup>b</sup> 5th grade Negro boys

* $F = 5.13; p < .05$
### APPENDIX K

#### A. Means and Standard Deviations of Mean Ps for Each Cell

1) **Chance condition-mean Ps**

<table>
<thead>
<tr>
<th></th>
<th>$I_{CPT}$</th>
<th>$E_{CPT}$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Middle</td>
<td>Low</td>
</tr>
<tr>
<td>$I_B$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N = 9</td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>$\bar{x} = 3.66$</td>
<td></td>
<td>3.81</td>
</tr>
<tr>
<td>SD = 0.84</td>
<td></td>
<td>0.78</td>
</tr>
<tr>
<td>$E_B$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N = 9</td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>$\bar{x} = 3.27$</td>
<td></td>
<td>3.66</td>
</tr>
<tr>
<td>SD = 0.89</td>
<td></td>
<td>0.99</td>
</tr>
</tbody>
</table>

2) **Skill condition-mean Ps**

<table>
<thead>
<tr>
<th></th>
<th>$I_{CPT}$</th>
<th>$E_{CPT}$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Middle</td>
<td>Low</td>
</tr>
<tr>
<td>$I_B$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N = 9</td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>$\bar{x} = 3.02$</td>
<td></td>
<td>2.65</td>
</tr>
<tr>
<td>SD = 1.28</td>
<td></td>
<td>1.14</td>
</tr>
<tr>
<td>$E_B$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N = 9</td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>$\bar{x} = 3.30$</td>
<td></td>
<td>2.98</td>
</tr>
<tr>
<td>SD = 1.15</td>
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<td>1.01</td>
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</tbody>
</table>
APPENDIX K (continued)

3) Skill condition - mean distance

<table>
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<tr>
<th></th>
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<th>$E_{CPT}$</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Middle</td>
<td>Low</td>
<td>Middle</td>
<td>Low</td>
</tr>
<tr>
<td>$I_B$</td>
<td>N = 9</td>
<td>12</td>
<td>7</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>$\bar{X}$ = 11.49</td>
<td>12.79</td>
<td>11.39</td>
<td>13.55</td>
</tr>
<tr>
<td></td>
<td>SD = 2.18</td>
<td>2.06</td>
<td>2.59</td>
<td>1.84</td>
</tr>
<tr>
<td>$E_B$</td>
<td>N = 9</td>
<td>9</td>
<td>11</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>$\bar{X}$ = 10.45</td>
<td>11.61</td>
<td>11.78</td>
<td>12.78</td>
</tr>
<tr>
<td></td>
<td>SD = 1.89</td>
<td>0.98</td>
<td>2.18</td>
<td>1.84</td>
</tr>
</tbody>
</table>

4) Skill condition - success

<table>
<thead>
<tr>
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<th>$E_{CPT}$</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Middle</td>
<td>Low</td>
<td>Middle</td>
<td>Low</td>
</tr>
<tr>
<td>$I_B$</td>
<td>N = 9</td>
<td>12</td>
<td>7</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>$\bar{X}$ = 23.67</td>
<td>24.17</td>
<td>23.86</td>
<td>24.28</td>
</tr>
<tr>
<td></td>
<td>SD = 3.16</td>
<td>4.65</td>
<td>5.01</td>
<td>3.86</td>
</tr>
<tr>
<td>$E_B$</td>
<td>N = 9</td>
<td>9</td>
<td>11</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>$\bar{X}$ = 21.67</td>
<td>23.78</td>
<td>21.27</td>
<td>23.27</td>
</tr>
<tr>
<td></td>
<td>SD = 4.42</td>
<td>4.02</td>
<td>3.13</td>
<td>4.76</td>
</tr>
</tbody>
</table>
B. Four Way Analysis of Covariance\(^a\) for Mean Ps Scores

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>( P &lt; )</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Bialer</td>
<td>1</td>
<td>0.02</td>
<td>0.02</td>
<td>----</td>
</tr>
<tr>
<td>2. CPT</td>
<td>1</td>
<td>3.51</td>
<td>3.58</td>
<td>.06</td>
</tr>
<tr>
<td>3. Social Class</td>
<td>1</td>
<td>2.42</td>
<td>2.46</td>
<td>----</td>
</tr>
<tr>
<td>4. Psychological Situation</td>
<td>1</td>
<td>12.50</td>
<td>12.75</td>
<td>.001</td>
</tr>
<tr>
<td>4x1</td>
<td>1</td>
<td>0.40</td>
<td>0.41</td>
<td>----</td>
</tr>
<tr>
<td>4x2</td>
<td>1</td>
<td>0.69</td>
<td>0.71</td>
<td>----</td>
</tr>
<tr>
<td>4x3</td>
<td>1</td>
<td>0.30</td>
<td>0.30</td>
<td>----</td>
</tr>
<tr>
<td>4x4</td>
<td>1</td>
<td>0.85</td>
<td>0.86</td>
<td>----</td>
</tr>
<tr>
<td>3x4</td>
<td>1</td>
<td>0.12</td>
<td>0.12</td>
<td>----</td>
</tr>
<tr>
<td>2x4</td>
<td>1</td>
<td>2.29</td>
<td>2.34</td>
<td>----</td>
</tr>
<tr>
<td>2x3</td>
<td>1</td>
<td>0.00</td>
<td>0.00</td>
<td>----</td>
</tr>
<tr>
<td>2x1x2</td>
<td>1</td>
<td>0.98</td>
<td>1.00</td>
<td>----</td>
</tr>
<tr>
<td>2x1x4</td>
<td>1</td>
<td>0.01</td>
<td>0.01</td>
<td>----</td>
</tr>
<tr>
<td>1x3x4</td>
<td>1</td>
<td>0.00</td>
<td>0.00</td>
<td>----</td>
</tr>
<tr>
<td>1x2x3x4</td>
<td>1</td>
<td>0.52</td>
<td>0.53</td>
<td>----</td>
</tr>
<tr>
<td>Residual</td>
<td>168</td>
<td>0.98</td>
<td>----</td>
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</tr>
</tbody>
</table>

\(^a\) N = 185 observations
APPENDIX L

Ns, Means, and Standard Deviations of Change Scores

A. Mean Ps

<table>
<thead>
<tr>
<th></th>
<th>ICPT</th>
<th>ECPT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Middle</td>
<td>Low</td>
</tr>
<tr>
<td>IB</td>
<td>N = 9</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>$\bar{X}$ = 0.74</td>
<td>1.41</td>
</tr>
<tr>
<td></td>
<td>SD = 0.68</td>
<td>1.26</td>
</tr>
<tr>
<td>EB</td>
<td>N = 9</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>$\bar{X}$ = 1.33</td>
<td>1.41</td>
</tr>
<tr>
<td></td>
<td>SD = 0.83</td>
<td>0.66</td>
</tr>
</tbody>
</table>

B. Number of Shifts

<table>
<thead>
<tr>
<th></th>
<th>ICPT</th>
<th>ECPT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Middle</td>
<td>Low</td>
</tr>
<tr>
<td>IB</td>
<td>N = 9</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>$\bar{X}$ = 1.33</td>
<td>1.67</td>
</tr>
<tr>
<td></td>
<td>SD = 1.58</td>
<td>1.56</td>
</tr>
<tr>
<td>EB</td>
<td>N = 9</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>$\bar{X}$ = 1.13</td>
<td>1.33</td>
</tr>
<tr>
<td></td>
<td>SD = 0.99</td>
<td>1.41</td>
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</tbody>
</table>
APPENDIX M

Ns, Means, and Standard Deviations of Deviation Scores

1. **Chance - P Deviation**

<table>
<thead>
<tr>
<th></th>
<th>ICPT</th>
<th>ECPT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Middle</td>
<td>Low</td>
</tr>
<tr>
<td>IB</td>
<td>N = 9</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>$\bar{X}$ = 1.60</td>
<td>1.62</td>
</tr>
<tr>
<td></td>
<td>SD = 0.29</td>
<td>0.45</td>
</tr>
<tr>
<td>EB</td>
<td>N = 9</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>$\bar{X}$ = 1.54</td>
<td>1.48</td>
</tr>
<tr>
<td></td>
<td>SD = 0.30</td>
<td>0.37</td>
</tr>
</tbody>
</table>

2. **Skill - P Deviation**

<table>
<thead>
<tr>
<th></th>
<th>ICPT</th>
<th>ECPT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Middle</td>
<td>Low</td>
</tr>
<tr>
<td>IB</td>
<td>N = 9</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>$\bar{X}$ = 1.67</td>
<td>1.54</td>
</tr>
<tr>
<td></td>
<td>SD = 0.44</td>
<td>0.65</td>
</tr>
<tr>
<td>EB</td>
<td>N = 9</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>$\bar{X}$ = 1.67</td>
<td>1.62</td>
</tr>
<tr>
<td></td>
<td>SD = 0.70</td>
<td>0.43</td>
</tr>
</tbody>
</table>
### 3. Skill-Distance Deviation

<table>
<thead>
<tr>
<th></th>
<th>$I_{CPT}$</th>
<th></th>
<th>$E_{CPT}$</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Middle</td>
<td>Low</td>
<td>Middle</td>
<td>Low</td>
</tr>
<tr>
<td>$I_B$</td>
<td>N = 9</td>
<td>12</td>
<td>7</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>$\bar{X} = 3.22$</td>
<td>3.02</td>
<td>$\bar{X} = 3.38$</td>
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<tr>
<td></td>
<td>SD = 0.83</td>
<td>0.64</td>
<td>SD = 1.34</td>
<td>0.82</td>
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</table>

- **$I_B$**
- **$E_B$**
APPENDIX N

A. Ns, Means, and Standard Deviations of Variability Scores

1. Number of Shifts - Chance

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<thead>
<tr>
<th></th>
<th>ICPT (Middle)</th>
<th>ICPT (Low)</th>
<th>ECPT (Middle)</th>
<th>ECPT (Low)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IB</td>
<td>N = 9</td>
<td>12</td>
<td>7</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>X = 8.22</td>
<td>7.33</td>
<td>7.00</td>
<td>7.17</td>
</tr>
<tr>
<td></td>
<td>SD = 0.97</td>
<td>1.23</td>
<td>1.53</td>
<td>1.54</td>
</tr>
<tr>
<td>EB</td>
<td>N = 9</td>
<td>9</td>
<td>11</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>X = 8.11</td>
<td>7.78</td>
<td>7.09</td>
<td>7.13</td>
</tr>
<tr>
<td></td>
<td>SD = 1.17</td>
<td>1.86</td>
<td>1.87</td>
<td>1.06</td>
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</table>

2. Number of Shifts - Skill

<table>
<thead>
<tr>
<th></th>
<th>ICPT (Middle)</th>
<th>ICPT (Low)</th>
<th>ECPT (Middle)</th>
<th>ECPT (Low)</th>
</tr>
</thead>
<tbody>
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<td>IB</td>
<td>N = 9</td>
<td>12</td>
<td>7</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>X = 7.33</td>
<td>6.33</td>
<td>6.86</td>
<td>5.61</td>
</tr>
<tr>
<td></td>
<td>SD = 1.50</td>
<td>2.57</td>
<td>1.57</td>
<td>2.70</td>
</tr>
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### APPENDIX N (continued)

3. **Magnitude of Shifts - Chance**

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<tr>
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4. **Magnitude of Shifts - Skill**

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5. % Unusual Shifts - Chance

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<td></td>
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<tr>
<td>N = 9</td>
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<td></td>
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<tr>
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<tr>
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<td>15</td>
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<tr>
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6. % Unusual Shifts - Skill

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<td>Low</td>
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<tr>
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**APPENDIX N (continued)**

### B. Four Way Analysis of Covariance for Variability Scores (185 Observations)

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<th>Source</th>
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<th>% of Unusual Shifts</th>
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<td></td>
<td>MS</td>
<td>F</td>
<td>MS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MS</td>
<td>F</td>
<td>MS</td>
</tr>
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<td>3.11 0.97</td>
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<tr>
<td>2. CPT</td>
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<td>26.77 8.34**</td>
<td>120.19 4.39*</td>
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<tr>
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<td>0.03 1.04</td>
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<td>0.01 0.31</td>
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<tr>
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<td>0.10 3.05</td>
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<tr>
<td>Residual</td>
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<td>3.21 ----</td>
<td>27.38 ----</td>
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</table>

* * p < .05  ** ** p < .005  *** *** p < .001
APPENDIX O

Use of Feedback

We developed a score to measure subjects' use of feedback in terms of direction and magnitude of change after each trial. The figure below was used to assign scores. It considers the following:

1. Level of difficulty of shot taken. Distances E and F were assigned to "high risk", distance D to "intermediate risk", and distances A, B, and C to "low risk".

2. Success versus failure. If subject succeeded, the solid line was used, and if he failed, the broken line was used to determine his score for that trial.

3. Magnitude of shift. Values of 0, 1, 2, and 3 were arbitrarily assigned to various shifts depending on how difficult the distance was from which the subject attempted his previous shot, whether he succeeded or failed, and where he chose to attempt his next shot.

Use of the figure is illustrated by two examples:

a. On any given trial, assume subject stood at distance D, failed, and then shifted to distance C for his next shot. In this case, he would receive a score of 3 (maximum number of points) for that shift. Since D is intermediate level, he is rewarded by trying the next easier distance after failure. If, however, he succeeded at D and moved to C, he would receive a score of 1 for that shift; i.e., he would be slightly penalized for responding to success at an intermediate level by shifting to an easier one.

b. If subject succeeded at E and remained there for his next trial, he would receive a score of 3, indicating good use of feedback at a high risk level. If, however, he failed at E and remained there for his next shot, he would receive a score of 1, i.e., he would be penalized for not moving to an easier level after failure at a difficult one.

Thus we see that our Use of Feedback Score takes into account whatever the subject does after each trial. Even though this is conceptually
meaningful only for skill situations (where success and failure are due to the subjects' behavior), we also applied the Use of Feedback score to chance to see how the subjects "used feedback" there.

Success __________

Failure __________

Each vertical line represents a shift of one distance or Ps level. Arrows indicate which set of lines to use for high, intermediate, and low levels of risk.

[Diagram showing vertical lines with arrows indicating high, intermediate, and low risk levels.]
Use of Feedback Scores

<table>
<thead>
<tr>
<th>Group</th>
<th>Chance</th>
<th>Skill</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bialer Internal</td>
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</tr>
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<td>Bialer External</td>
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<td></td>
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<tr>
<td>Internal-Low</td>
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<tr>
<td>External-Middle</td>
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</tr>
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<td>External-Low</td>
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<tr>
<td>External-Low</td>
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<td>16.5</td>
</tr>
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</table>

a no significant Fs

b based on Ps data

c based on distance data