ABSTRACT

CRYSTALLIZATION TRENDS IN THE LEVELS OF OCCUPATIONAL ASPIRATION OF ELEMENTARY AND SECONDARY SCHOOL STUDENTS

by Jon Hill Rieger

The general problem under study in this thesis is the nature of the development of occupational aspirations in young people. The specific task is to investigate "crystallization trends" in the levels of occupational aspiration of elementary and secondary school students. The term crystallization refers to the consistency with which an individual is able to select a particular status level within the occupational hierarchy of the society toward which he is striving. It was anticipated that as a child grows up, the level of his occupational aspirations will become more precise and consistent (more crystallized), as a result of experience during his elementary and secondary school years. Moreover, it was anticipated that the degree of crystallization at any stage would be directly related to socio-economic status, intelligence, and performance in school work, for a high rank on any of these indexes ought to bring with it more rapid perception of the job structure, more accurate knowledge of the entrance requirements of various levels within it, and greater insight into one's own abilities with respect to it.

Hypotheses were constructed embodying the foregoing expectations, and a research design was set up for testing them. The particular technique used was a cross-sectional comparison of sample groups of boys and girls from the fifth through the twelfth grades in a public school system. Crystallization was measured by a modification of a

standardized instrument for assessing levels of occupational aspirations, intelligence and socio-economic status by standardized instruments, and grade point average from school records. The hypotheses were tested by comparing observed trends with a hypothesized trend line.

In general the hypotheses were supported by the evidence: 1) There is apparently a trend to increased crystallization in levels of occupational aspiration with increasing grade. 2) The degree of crystallization at any stage appears to be directly related to a person's socio-economic status, intelligence, and academic performance.

The thesis concludes with a statement of problems needing further investigation: 1) an analysis of the young person's perception as it relates to the occupational prestige hierarchy, to the entrance requirements of various occupational prestige levels, and to his own abilities, and 2) a further analysis and description of boy-girl differences in crystallization.

CRYSTALLIZATION TRENDS IN THE LEVELS OF OCCUPATIONAL ASPIRATION OF ELEMENTARY AND SECONDARY SCHOOL STUDENTS

By

Jon Hill Rieger

A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

MASTER OF ARTS

Department of Sociology and Anthropology

1961

ACKNOWLEDGMENT

Perhaps no thesis is consummated without a community of effort and support. This one has been developed under the patient indulgence and supervision of Dr. A. O. Haller, and to the degree that it epitomizes the rigor and discipline of scientific methodology in social science, it is due largely to his careful counsel and influence. From a purely monetary point of view, the progress of the research depended on the occasional support of the Michigan State Agricultural Experiment Station and their assistance is much appreciated. Furthermore, appreciation is extended to Donald Fink, Director of Pupil Personnel of the Grand Rapids School System, the Grand Rapids School Board, and the participating principals, teachers, and students, without whose cooperation this study could not even have been initiated.

****

TABLE OF CONTENTS

TABLE OF CONTENTS - Continued

LIST OF TABLES

LIST OF TABLES - Continued

TABLE Page

LIST OF FIGURES

FIGURE Page

LIST OF FIGURES - Continued

FIGURE Page

LIST OF APPENDICES

CHAPTER I

INTRODUCTION

Introduction

The following thesis consists in the development and testing of hypotheses concerning the levels of occupational aspiration of secondary and elementary school students.

The Problem

The problem is to trace crystallization trends[1] in the levels of occupational aspiration (LOA)[2] of secondary and elementary school students at successive stages in school, and, further, to investigate the possible effects of socio-economic status, intelligence, and academic performance variables on this crystallization process.

---

[1]Crystallization will be fully discussed conceptually on page 3 and operationally on page 17. Basically, it refers to the consistency with which an individual is able to identify and designate a particular level within the occupational hierarchy of the society toward which he is striving.

[2]For research exposition of this concept see A. O. Haller and I. W. Miller, The Occupational Aspiration Scale: Theory, Structure, and Correlates of an Instrument Designed to Measure Differential Levels of Occupational Aspiration, Mimeo., Michigan State University, East Lansing, Michigan, 1961; W. E. Sewell et al., "Social Status and Educational and Occupational Aspirations," American Sociological Review, Vol. 22, Feb. 1957; A. O. Haller and C. E. Butterworth, "Peer Influences on Levels of Occupational and Educational Aspiration," Social Forces, Vol. 38, May 1960.

The Importance of the Problem

The importance of this inquiry into crystallization is that it will further elucidate the nature of occupational aspiration processes, to wit; 1) it will show the extent to which levels of occupational aspiration tend to become stable as a child grows older, 2) it will expose the influence of certain other factors (viz., the person's socio-economic status, intelligence, and relative academic excellence) on this developmental process, and 3) by implication, it will have consequences for our supposition that an individual's perception of the status hierarchy undergoes important changes--becomes more precise--as a function of his increasing knowledge and experience during elementary and secondary school years. Such information is needed to fill a gap in our empirical knowledge about the basic development of individual occupational aspirations, including whether or not these aspirations do in fact become more precise and stabilized over time and whether or not this process is related to other important characteristics of the individual.

Conceptual Definition of Terms

The popular ability to rank-order the occupations in the society rather easily and consistently in terms of desirability or prestige implies that it is possible, and, in fact, routine, to abstract from an occupation to its particular "status level" within the whole structure. This process is evidently fundamental and is an important part of the technique by which persons evaluate the social status of others.

In such an occupational structure, some occupations are very close to each other in the amount of prestige accorded them, and can be considered, therefore, to have very nearly the same status level. By the same token, other occupations may have widely differing status levels.

The socialization of the young includes learning to a greater or lesser degree this popular adult evaluation of occupations. It can thus be expected that if a child is examined at progressive stages during his development, he will be found to have an increasingly accurate perception of the relative rankings of occupations.

In the development of his serious occupational aspirations the individual is confronted with this grand series of alternatives (the occupational hierarchy), and we may presume that his intent to enter one or another of these occupations is based significantly on his perception of whether or not he can meet its "entrance requirements." And he rapidly learns that the higher the level of an occupation the more difficult it is to meet these qualifications.

Insofar as the individual's knowledge of what it takes to enter the various occupations is borne largely of his learning and experience during his elementary and secondary school years, it is logical to conclude that his various occupational choices will be more consistent in terms of level as he approaches adulthood. This relative degree of precision which the individual has in his perception of the occupational hierarchy and the differential entrance requirements of various levels within it, and the relative degree to which he is therefore able to designate consistently a particular level within the structure toward which he is striving, may be thought of as the relative crystallization of his level of occupational aspiration.

The ascertainment of the existence of a crystallization process is perhaps most easily executed at the group level. Hence, it is on such a level that this statistical inquiry is made. The effort here is to expose trends in crystallization for the group, from which prediction can be made about individuals.

Rationale and Hypotheses

If the reasoning in the previous section is valid, there should be an increase in crystallization of the levels of the occupational choices of students, proceeding through elementary and secondary school, and reflecting these students' increasingly precise knowledge of: 1) the relative rankings of the various occupations in the society, 2) the differential entrance requirements for these occupations, and 3) their own differential abilities to meet such requirements. This increase in crystallization should prevail irrespective of socio-economic status, intelligence, and academic performance factors.

It is easily argued, however, that the highly intelligent individual will perceive the social structure, the requirements of various levels within it, and his own relative abilities faster and more accurately than will the less intelligent one. Furthermore, it is known that both socio-economic status and academic performance are directly correlated with intelligence. (High socio-economic status is associated with high intelligence and high academic performance.) Hence, it is anticipated that there will be differentials on the basis of these variables. Persons ranking high in these indexes should show a higher degree of crystallization at any stage than their lower ranking contemporaries.

On the basis of the above rationale the following hypotheses are made:

I. The degree of crystallization in the levels of occupational aspiration of young people will increase progressively, though perhaps not uniformly, as these people proceed through their elementary and secondary school years.

II. The degree of crystallization in the levels of occupational aspiration of young people during their elementary and secondary school years will be directly related to their socio-economic status.

a. At comparable stages in school upper class persons will tend to show greater crystallization in their levels of occupational aspiration than will lower class persons.

III. The degree of crystallization in the levels of occupational aspiration of young people during their elementary and secondary school years will be directly related to their intelligence.

a. At comparable stages in school persons of higher intelligence will show greater crystallization in their levels of occupational aspiration than will persons of lower intelligence.

IV. The degree of crystallization in the levels of occupational aspiration of young people during their elementary and secondary school years will be directly related to their academic performance.

a. At comparable stages in school persons of higher academic performance will show greater crystallization in their levels of occupational aspiration than will persons of lower academic performance.

Organization of the Thesis

The foregoing sections of Chapter I have: 1) introduced the problem under examination, 2) proposed an explanation for this problem, and 3) provided a set of hypotheses to test the validity of the explanation.

In Chapter II the research design for testing the hypotheses will be presented, listing and describing the instruments to be used, describing the site of the research and the sample, and stating exact operationalizations of the hypotheses. Chapter III contains the results of the research and includes graphs and tables showing the crystallization trends. Finally, in Chapter IV will be presented a summary of the research and the conclusions drawn from it, as well as a discussion of problems for future investigation.

CHAPTER II

RESEARCH DESIGN

Introduction

In the previous chapter the specific problem under examination was stated. Then a series of hypotheses were formulated to explain it. The purpose of the present chapter is to present the design of the research aimed at testing those hypotheses. Included here will be information about the instruments to be used, the research site and sample, the important variables, operational statements of the hypotheses, and a description of the form for testing the hypotheses.

Research Design

The ideal method of analyzing the problem posed in Chapter I would be to conduct a longitudinal study of the actual crystallization process in the levels of occupational aspiration of a cohort of students. This would involve taking measurements on these students annually for a period of perhaps five to ten years as these students proceed through their elementary and secondary school years.

Substituting for the ideal method in this research is another technique, the use of which allows for an approximation of longitudinal research without the time expense, namely a cross-sectional study. In this technique the instruments are administered simultaneously to a sampling of each grade in elementary and secondary school and inferences are made about longitudinal trends on the basis of these data.

The utility of this quasi-experimental[1] design depends to a large extent on the degree to which the several groups used duplicate in composition the character of a single group observed over the longer timespan. It is not necessarily true that a cross-sectional design such as is used in this research should seek to obtain exactly equated groups because it may be the experience of a single cohort to vary up and/or down on any given index. Hence, the real need is to preserve as much as possible the integrity of the "historical equation" rather than to ensure presently equated groups.

On the basis of the above reasoning, it is easy to see that this research, utilizing a cross-sectional approach, is going to allow some error to creep in through the fact that the drop-out of some students in high school will alter the composition and thus the "historical equation" of these groups. In the earlier grades the cross-section method will allow for the inclusion of data for certain types of persons who are not present in the later high school grades. This kind of error notwithstanding, it is still feasible to provide from such an experiment[2] as this a sufficient approximation of a longitudinal study as to warrant its execution.

Having already discussed the broad character of the technique of the research, it is now in order to describe the specific plan.

The basic independent variable in this experiment is school grade, and the experiment was set up for obtaining measurements on the fifth through the twelfth grades in a public school system. The purpose is

---

[1]See D. T. Campbell, "Factors Relevant to the Validity of Experiments in Social Settings," Psychological Bulletin, Vol. 54, July 1957. This type of design is discussed under the heading "Static Group Comparisons."

[2]Re the term experiment: Insofar as no experimental manipulation of the independent variable is part of this design, it is a "natural experiment" and the term will be used in this specific sense.

to measure in persons in each grade the degree of crystallization shown in their levels of occupational aspiration. Secondary independent variables include sex, socio-economic status, intelligence, and academic performance.

Instruments

For the purpose of measuring dependent and the relevant independent variables the following instruments were used. Copies of each are to be found in Appendix I.

Crystallization in Levels of Occupational Aspiration (LOA)

To measure crystallization in the occupational aspirations of the elementary and secondary school students the Occupational Aspiration Scale (OAS) developed by A. O. Haller[1] was used. The OAS is described by Haller and Miller[2] as

> . . . an eight item multiple choice instrument. It includes items permitting responses at both the realistic and idealistic expression levels of LOA, each at two time dimension periods, . . . short range (end of schooling) and long range (at age 30). The four possible combinations of these components are each assessed twice, thus giving a total of eight questions. The alternatives for each item consist of ten occupational titles drawn from among the ninety occupations ranked by the NORC (1947)[3] study of the prestige of occupations. . . . Each occupation is presented as a possible response only once on the form. Alternative responses for each item systematically span the entire range of occupational prestige, and are scored from zero to nine. Operationally, an item score

---

[1]A. O. Haller, Occupational Aspiration Scale, Copyright 1957 by A. O. Haller, Michigan State University, East Lansing, Michigan. A modified version of the OAS was used. This will be described below.

[2]A. O. Haller and I. W. Miller, op. cit., pp. 70, 74.

[3]National Opinion Research Center, "Jobs and Occupation: A Popular Evaluation," Opinion News, Vol. 9, 1947.

> of 9 indicates that the respondent has chosen an occupation from among the eight highest prestige occupations on the NORC scale, and an item score of 0 indicates that one of the eight lowest prestige occupations has been chosen. Thus, the total possible score for all eight items ranges from zero to seventy-two. This score is used to measure the individual's general LOA.

Data for the 1957 edition of the OAS reported by Haller and Miller indicate that it has a reliability of about .80[1] and a concurrent validity of .62.[2]

Since the development of the OAS, Haller and Miller[3] have made suggestions as to how the instrument might be improved, to wit: 1) shift the sets of response alternatives such that the means of the prestige levels represented in those alternatives are the same for each of the four basic questions in the instrument, thus giving it completely balanced response alternatives, and 2) randomize the order in which the response alternatives for each question are presented, remedying any possibility of a bias in item scores due to "response set."

For use in the present study these changes were accomplished and on 8 May 1961 the revised form[4] was administered immediately after the original to twenty-five high school seniors (fifteen boys and ten girls) at Union High School in Grand Rapids, Michigan. The correlation between responses on the two forms was +.88.

The way in which the Occupational Aspiration Scale can be used as a means of assessing the crystallization of LOA lies in the manner of its construction. Since it uses the four basic questions twice, in each

---

[1]A. O. Haller and I. W. Miller, op. cit., p. 100.

[2]Ibid., p. 102.

[3]Ibid., pp. 83-84.

[4]A. O. Haller, Occupational Aspiration Scale, Revision 1. Copyright 1961 by A. O. Haller, Michigan State University, East Lansing, Michigan.

case with a different set of response alternatives, the degree of crystallization in the response will vary inversely with the discrepancy in status level between the individual's choices with respect to identical questions. For example, the greater the difference in terms of level between his answers to the two realistic short range (RS) questions, (What job are you really sure you can get by the time your schooling is over?) the lower is the person's crystallization of his realistic short-range LOA.

The fact that eighty occupations in the hierarchy were reduced to ten different ranks (8 titles per rank) for scoring purposes in this instrument introduces some difficulty in measuring precisely the crystallization in LOA. To overcome this difficulty a conversion table (see Table 1) was developed, allowing the OAS item scores to be coded according to the values listed in the original NORC study.[1] Thus the possible item scores range from 33 to 96, and the potential crystallization discrepancies from 0 to 63.

By the above method a crystallization score was rendered for each of the four basic components: realistic short-range (RS), idealistic short-range (IS), realistic long-range (RL), and idealistic long-range (IL).

Socio-economic Status (SES)

Socio-economic status was assessed on the basis of father's occupation; the source of information for this purpose was twofold. Firstly, a questionnaire[2] was constructed for the students to fill in and this included a question inquiring about what the father did at his job.

---

[1]NORC, op. cit.

[2]Student Information and Occupational Plans Questionnaire. See Appendix I.

Table 1. Conversion Table for OAS Scoring

Question 1 RS_1		Question 2 IS_1		Question 5 RL_1		Question 6 IL_1	
OAS Score	NORC Score	OAS Score	NORC Score	OAS Score	NORC Score	OAS Score	NORC Score
0	47	0	46	0	45	0	44
1	52	1	52	1	50	1	49
2	60	2	60	2	59	2	58
3	67	3	67	3	66	3	65
4	73	4	72	4	71	4	69
5	77	5	77	5	75	5	75
6	82	6	81	6	81	6	81
7	86	7	86	7	86	7	85
8	89	8	88	8	87	8	87
9	96	9	93	9	93	9	92

Question 3 RS_2		Question 4 IS_2		Question 7 RL_2		Question 8 IL_2	
OAS Score	NORC Score	OAS Score	NORC Score	OAS Score	NORC Score	OAS Score	NORC Score
0	33	0	34	0	35	0	40
1	47	1	48	1	48	1	49
2	53	2	54	2	54	2	58
3	62	3	62	3	62	3	63
4	67	4	68	4	68	4	68
5	73	5	73	5	74	5	74
6	78	6	79	6	80	7	80
7	82	7	83	7	83	8	84
8	86	8	86	8	86	8	86
9	89	9	89	9	90	9	92

The students were asked to tell as specifically as possible what their fathers did.

Secondly, a form was constructed for use by the experimenter in recording academic grades[1] which included a section on parents' occupations. Hence, corroborating information was culled from the school records to confirm the student's perception of his father's occupation or to supply such information where the student gave no response or did not know what his father did for a living.

The information was then coded on the basis of O. D. Duncan, "A Socio-economic Index for All Occupations."[2] The validity correlation between this scale and the NORC prestige scale mentioned earlier is listed by Duncan at +.72.[3]

The possible SES scores ranged from zero to ninety-six. Where there was a major discrepancy between the student's response and the school record, the records were presumed to be obsolete and the student's answer was used for evaluating SES. In cases where neither the school records nor the student was sufficiently specific to render possible an exact identification of the nature of the father's occupation, the score for the general classification in which it fitted was assigned. Thus, for example, where the available information included only that the father was "labor in a factory" [sic], the individual was scored for the general category "operatives and kindred workers" and given an SES score of 18. Where there was no information at all, the case was simply omitted in the analysis of SES influences. The inter-coder reliability

---

[1]Student Academic Record Information Form. See Appendix I. The recording and evaluating of academic performance will be discussed below.

[2]O. D. Duncan, "A Socio-economic Index for all Occupations." (Two chapters of a forthcoming book by Albert Reiss.)

[3]Ibid.

coefficient for a sample of 55 cases (every seventh case when the sample was arranged by boys-girls, in alphabetical order, by increasing grade) was +.98.

The cut-off between high SES and low SES individuals was made by rank-ordering the cases in terms of SES and halving the total sample. The cut-off point was located as near the median as possible, at score 31, which on the NORC scale is at the status level of millwrights. Trained machinists are just above this cut-off point and bus and street railway conductors are just below it on the same scale.

Intelligence

The instrument used for the measurement of intelligence was selected on the basis of its short administration time, its careful standardization and the availability of some evidence for its reliability and validity, and its relative freedom from class bias.

Published by the Institute of Personality and Ability Testing, it is the Test of G, Culture Free.[1] This test was developed by R. B. Cattell and A. K. S. Cattell and is a non-verbal instrument, the total testing time for which is $12\frac{1}{2}$ minutes. Scales 2a and 3a were used for the appropriate age groups. The validity of this test is listed by IPAT at .73 and the reliability between .70 and .92.[2]

Test raw scores were converted to I.Q. Classical Scores by use of tables provided by IPAT.[3] These were then rank-ordered and the entire sample halved, yielding high I.Q. and low I.Q. sub-samples.

---

[1]R. B. Cattell and A. K. S. Cattell, IPAT, Test of G: Culture Free, Scales 2a and 3a.

[2]IPAT, Handbook for the Individual or Group, Culture Free Intelligence Test, 1959.

[3]Ibid.

The cut-off point was located as near the median as possible, at score 98. I.Q. data were available for all students in the total sample.

Academic Performance

The students' grade point averages (GPA) in the four basic subjects[1] were used as the measure of academic performance. These averages were computed by the experimenter from the school records and were listed for two or more years for each student. (The Student Academic Record Information Form, used for this purpose, will be found in Appendix I.) The students in each class were rank-ordered on the basis of their most recent grades, earlier grades being used to break ties. These rank-order positions were then converted into percentile rankings by the formula $1 - \frac{\text{Rank}}{N}$.

The whole sample was then rank-ordered on the basis of GPA percentile rankings and halved to provide high GPA and low GPA subsamples. The cut-off point, just above the median, was at rank 49. Those persons for whom there was no academic information available were omitted from consideration in the analysis of GPA influences.

The use of grade point averages is assumed to be valid means of assessing academic excellence. Courses such as shop and physical education were not considered in computing GPA, for these were considered extraneous in assessing academic excellence.

Site and Sample

The research site selected for this study was Grand Rapids, Michigan. This community was chosen as satisfactory for the reasons that: 1) with a population of 177,313[2] a wide status range would be

---

[1]Mathematics, science, English, and social science.

[2]U. S. Census of Population 1960, Final Report PC(1)-24A.

represented in the school system, 2) in composition the population itself is fairly representative of communities of this size, and 3) there are no peculiar conditions or social problems (e.g., a serious Negro-white conflict) which could conceivably, and perhaps deceptively, affect the process to be investigated.

The effort in sampling was to obtain balanced representation from all socio-economic classes. For the fifth and sixth grade samples two separate schools were selected, one of which served a middle class neighborhood and the other of which served a lower class neighborhood. These schools, Westwood Hills School and Turner School respectively, channeled students into Union High School. These three schools, then, constituted the most nearly ideal site for this research within the Grand Rapids school system, and classes in each grade were selected in these schools to provide the widest and most evenly balanced representation possible. The plan was for a sample size of about fifty persons per grade from the fifth through the twelfth grades in school. The decision to limit the study to the last eight grades was arbitrary and based on the reasoning that apart from the question as to whether the younger children could negotiate the instruments satisfactorily, it is questionable whether such children contain anything in the nature of what could seriously be called "occupational aspirations."

A pilot administration of the instruments was completed in the fifth grade class at Straight School prior to the conduct of the experiment for the purpose of checking estimates of the time needed for the experimental schedule and for familiarizing the experimenter with the administration procedure and classroom management technique.

It was evident immediately from this preliminary administration that the written vocabulary of many students in the earlier grades was inadequate for them to handle the OAS. For this reason it was concluded that the instructions, questions, and response alternatives should be

read aloud. The instructions for the intelligence test were abbreviated from the IPAT Test Manual and were given orally and the student information questionnaire was also read aloud with the necessary pauses for the students to fill in the answers. For the purpose of standardization, the same procedure was followed for all eight grades.

In each case the class teacher had been previously informed of the fact of the study and, on the arrival of the experimenter, provided an introduction and assisted in the administration. The introductory remarks of the experimenter consisted of the following:

> My name is Mr. Rieger, and I am from Michigan State University. Today we have two questionnaires for you to fill out and a short test for you to take. The purpose of these is to give us a better understanding of you young people and how things look from your point of view.
>
> By carefully answering the questions on the sheets of paper, and by taking the short test, you will give us a better picture of things as a _____ grader sees them. This information may help to make student counseling better.

The instruments were then administered in the following order: 1) the Occupational Aspiration Scale, 2) IPAT Test of G: Culture Free, 3) Student Information and Occupational Plans Questionnaire.

The logic of the particular order in which these were given is as follows. The OAS was administered first because the nature of this instrument is such as to arouse interest, especially on the part of the younger students. The utility of such interest in overcoming any anxieties about strangers in the room, etc., is obvious. Furthermore, it was important to avoid any confusion that the OAS was a test, and this was most easily accomplished before any testing atmosphere was established.

The intelligence test was given next. It was anticipated that the younger students would fatigue rapidly, and testing should be done as soon as possible in the schedule. (The rapid fatigue of the younger students was correctly anticipated.)

Since the questionnaire sought only rote information it fell last in order of administration. If there were high fatigue in the students or if there were insufficient time left, it was probable that the study would suffer least from the failure to complete the information questionnaire. As it happened, the students were able to complete this form easily within the time allowed.

After the collection of all the materials was completed the experimenter answered questions from the students and then departed.

The character of the sample in terms of OAS mean scores by grade is presented in Figure 1. The mean LOA of the sample varied only slightly from the fifth through the twelfth grades. Differences between boys and girls virtually disappeared by the eleventh grade. There is a definite U-shape to the curve for the sample, the lowest point of which occurs in the ninth grade. It is not known at present how to explain this dynamic. However, it may be that the upward trend which begins at the tenth grade is due to the possible increasing tendency of low aspirers to drop out of school, which they may elect to do after reaching the age of sixteen.

The SES, I.Q., and GPA variables for the total sample were correlated[1] as follows:

SES - I.Q. T = +.141 (significant at the .01 level)

SES - GPA T = +.220 (significant at the .001 level)

I.Q. - GPA T = +.272 (significant at the .001 level)

Summary of Operational Definitions of the Variables

The concepts used in this study are operationalized as follows:

Crystallization of Level of Occupational Aspiration: The discrepancy in points between the NORC levels of the (two) responses to

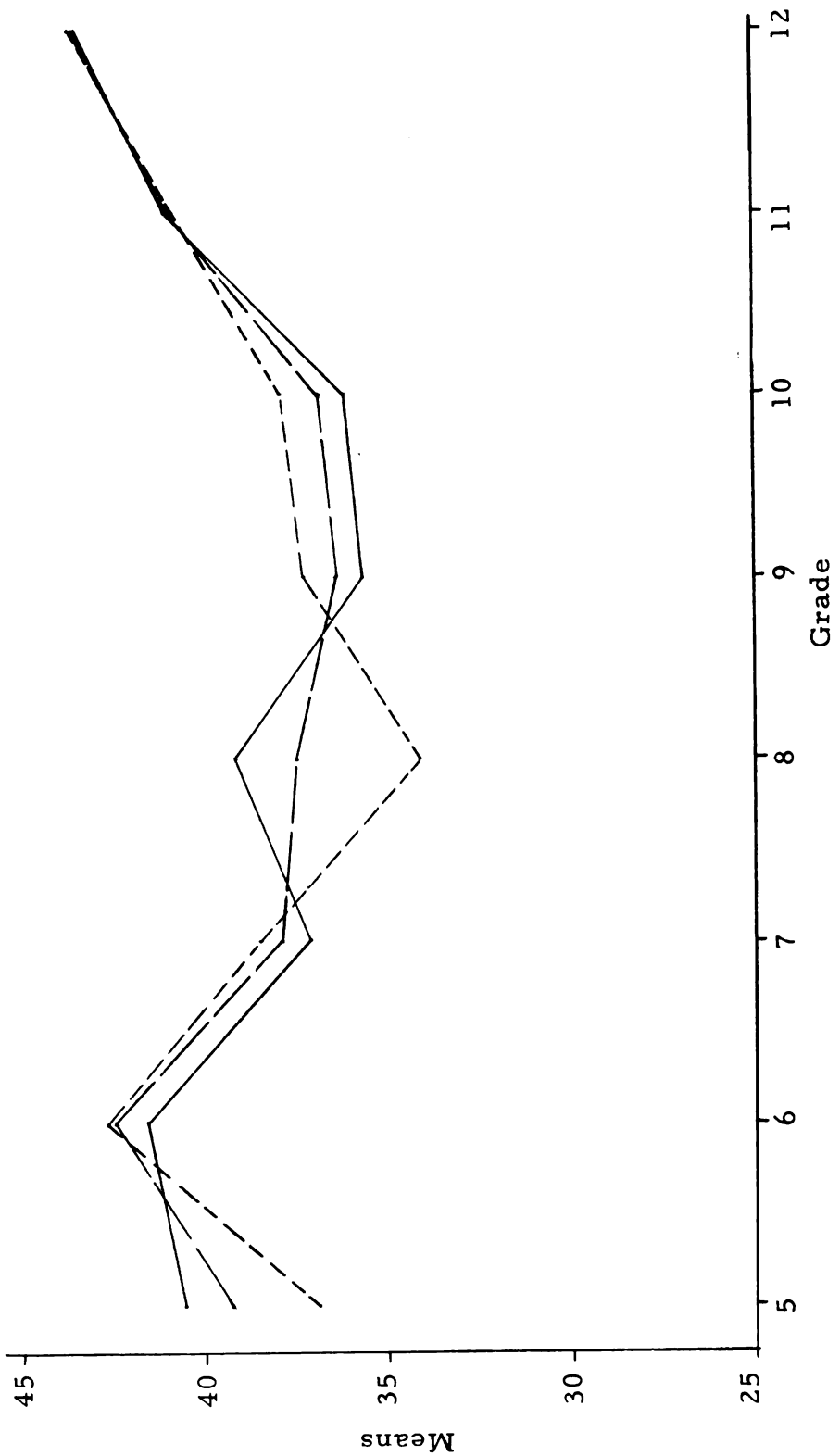
---

[1]These correlations were rendered by the method described in M. J. Hagood, Statistics for Sociologists (New York: Holt, 1941), pp. 513-514, a technique which will tend, if anything, to underestimate the degree of association between variables.

Figure 1

OCCUPATIONAL ASPIRATION SCALE MEAN SCORES
BY GRADE; BOYS, GIRLS, BOYS AND GIRLS

—— Boys ---- Girls — — — Boys and Girls



identical questions on the Occupational Aspiration Scale. The lower the number of points discrepancy, the higher the degree of crystallization. Zero discrepancy is the equivalent of complete crystallization.

Socio-economic Status: The score assigned to an individual as a result of his father's occupation as ranked on the basis of O. D. Duncan, "A Socio-economic Index for All Occupations."[1] The sample is divided into high SES and low SES sub-samples with a cut-off point at score 31.

Intelligence: The score assigned to an individual based on his performance on IPAT Test of G: Culture Free. The sample is divided into high I.Q. and low I.O. sub-samples with a cut-off point at score 98.

Grade Point Average: The percentile rank assigned to an individual resulting from the application of the formula $1 - \frac{\text{Rank}}{N}$ to the rank-order positions of all members of a particular grade in the sample. The rank-order positions were arrived at by the computation and comparison of academic averages in mathematics, science, English, and social science. The total sample is divided into high GPA and low GPA sub-samples with a cut-off point at percentile rank 49.

Operational Statements of the Hypotheses

The hypotheses proposed in Chapter I are operationalized as follows:

I. The mean discrepency in points between the NORC levels of the (two) responses to each of four sets of identical questions on the Occupational Aspiration Scale made by students in the fifth through the twelfth grades in school will show a declining trend as grade increases.[2]

---

[1]O. D. Duncan, op. cit.

[2]It is to be noted that the inverse relationship proposed in this and the following hypotheses signifies a direct relationship of crystallization in LOA.

II. The discrepancy in points between the NORC levels of the (two) responses to each of four sets of identical questions on the Occupational Aspiration Scale made by students in the fifth through the twelfth grades in school will be inversely related to the level of their fathers' occupations on O. D. Duncan, "A Socio-economic Index for All Occupations."

   a. At comparable stages in school high SES persons will tend to have smaller group mean discrepancies than low SES persons.

III. The discrepancy in points between the NORC levels of the (two) responses to each of four sets of identical questions on the Occupational Aspiration Scale made by students in the fifth through the twelfth grades in school will be inversely related to these students' scores on IPAT Test of G: Culture Free.

   a. At comparable stages in school high I.Q. persons will tend to have smaller group mean discrepancies than low I.Q. persons.

IV. The discrepancy in points between the NORC levels of the (two) responses to each of four sets of identical questions on the Occupational Aspiration Scale made by students in the fifth through the twelfth grades in school will be inversely related to these students' grade point average percentile rankings.

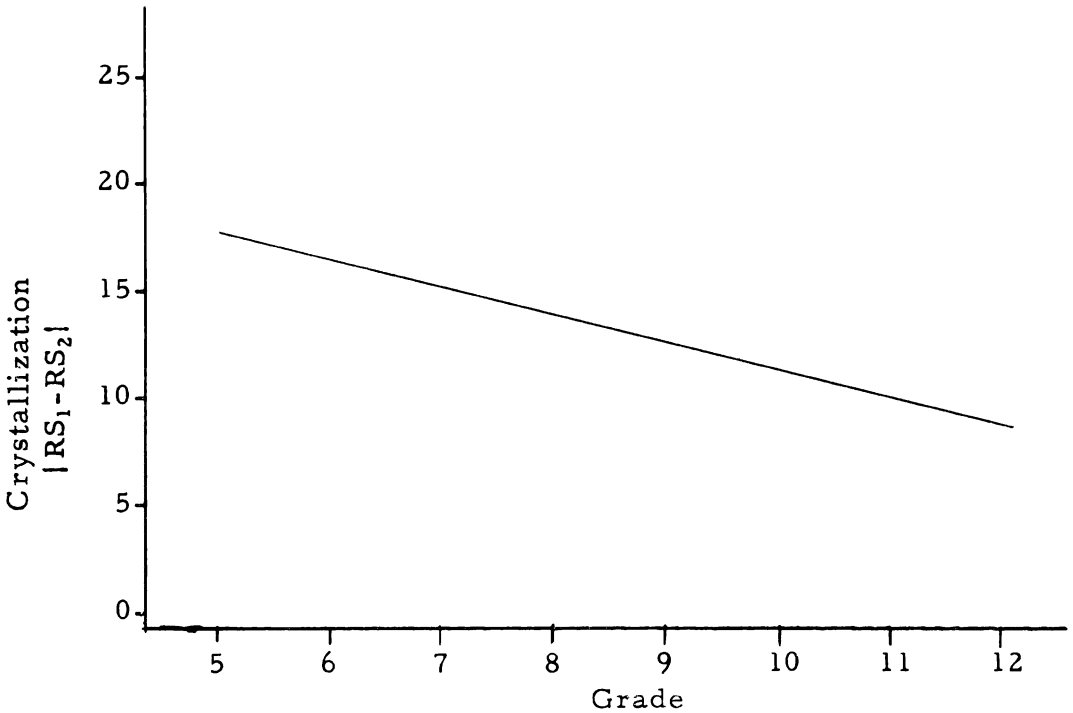
   a. At comparable stages in school high GPA persons will tend to have smaller group mean discrepancies than low GPA persons.

Form for Testing Hypotheses

Since the purpose of the study is to show trends in crystallization, the form to be used in presenting the results will consist of tables and graphs. An example of the graph presentation of crystallization follows.

Figure 2

HYPOTHETICAL CRYSTALLIZATION OF RS BY GRADE



In Figure 2 above, the dependent variable, crystallization, is read on the ordinate and the independent variable, grade, is read along the abscissa. The crystallization scale is calibrated in terms of the number of points of discrepancy between responses to the two realistic short-range questions on the OAS. Hence, the lower the score, the higher the degree of crystallization of LOA for this component. The tables accompanying the graphs will contain the data from which the graphs were constructed.

Variances of crystallization responses for each sub-sample will be presented in tabular form to provide additional insight into the patterning of the crystallization process.

Summary

This chapter has dealt with the technique for testing the hypotheses proposed in Chapter I. The basic research design has been discussed, the instruments have been specified, and the research site and sampling, as well as the data gathering process, have been described. Finally, the variables and hypotheses have been translated into operational statements and the form for testing the hypotheses has been illustrated. The next chapter will present the results of the experiment, showing in detail the findings with respect to the hypotheses already proposed.

CHAPTER III

RESULTS

Introduction

The purpose of the present chapter is to present the results of the research project outlined in the previous two chapters. These results will be presented in the consecutive order of the hypotheses.

Results

The basic hypothesis concerning the existence of a crystallization process is restated below:

I. The mean discrepancy in points between the NORC levels of the (two) responses to each of four sets of identical questions on the Occupational Aspiration Scale made by students in the fifth through the twelfth grades in school will show a declining trend as grade increases.

Table 2 contains the data for the crystallization trends by grade of each of the four components of the OAS; realistic short-range (RS), idealistic short-range (IS), realistic long-range (RL), and idealistic long-range (IL). These data are plotted in Figure 3. Table 2 also contains summary data which are plotted in Figure 3 as an overall crystallization trend.

Comparing Table 2 and Figure 3 with the hypothetical trend presented in Figure 2, it can be seen that Hypothesis I is supported. There is a general tendency for a decrease in the discrepancy between the NORC levels of the responses given for each of the four sets of

Table 2. OAS Component and Summary Crystallization by Grade, Mean Scores. (Lower Means Indicate Greater Crystallization) Hypothesis: Crystallization will increase by grade.

Component		Grade							
		5	6	7	8	9	10	11	12
RS	Σ	446	579	528	533	533	484	417	418
	N	35	45	49	51	51	50	48	51
	$\overline{X}$	12.74	12.87	10.78	10.45	10.41	9.68	8.69	8.19
IS	Σ	589	771	770	678	678	613	823	588
	N	35	45	49	51	51	50	48	51
	$\overline{X}$	16.83	17.13	15.71	13.29	13.29	12.26	17.14	11.53
RL	Σ	540	612	718	727	609	646	627	611
	N	35	45	49	51	51	50	48	51
	$\overline{X}$	15.43	13.60	14.65	14.25	11.94	12.92	13.06	11.98
IL	Σ	451	458	527	497	615	582	475	452
	N	35	45	49	51	51	50	48	51
	$\overline{X}$	12.88	10.18	10.75	9.74	12.06	11.64	9.89	8.86
SUMMARY	Σ	2026	2420	2543	2435	2435	2325	2342	2069
	N	140	180	196	204	204	200	192	204
	$\overline{X}$	14.47	13.44	12.97	11.94	11.94	11.63	12.20	10.14

Figure 3

CRYSTALLIZATION BY GRADE, BOYS AND GIRLS

Hypothesis: Crystallization will increase by grade.

N = 380

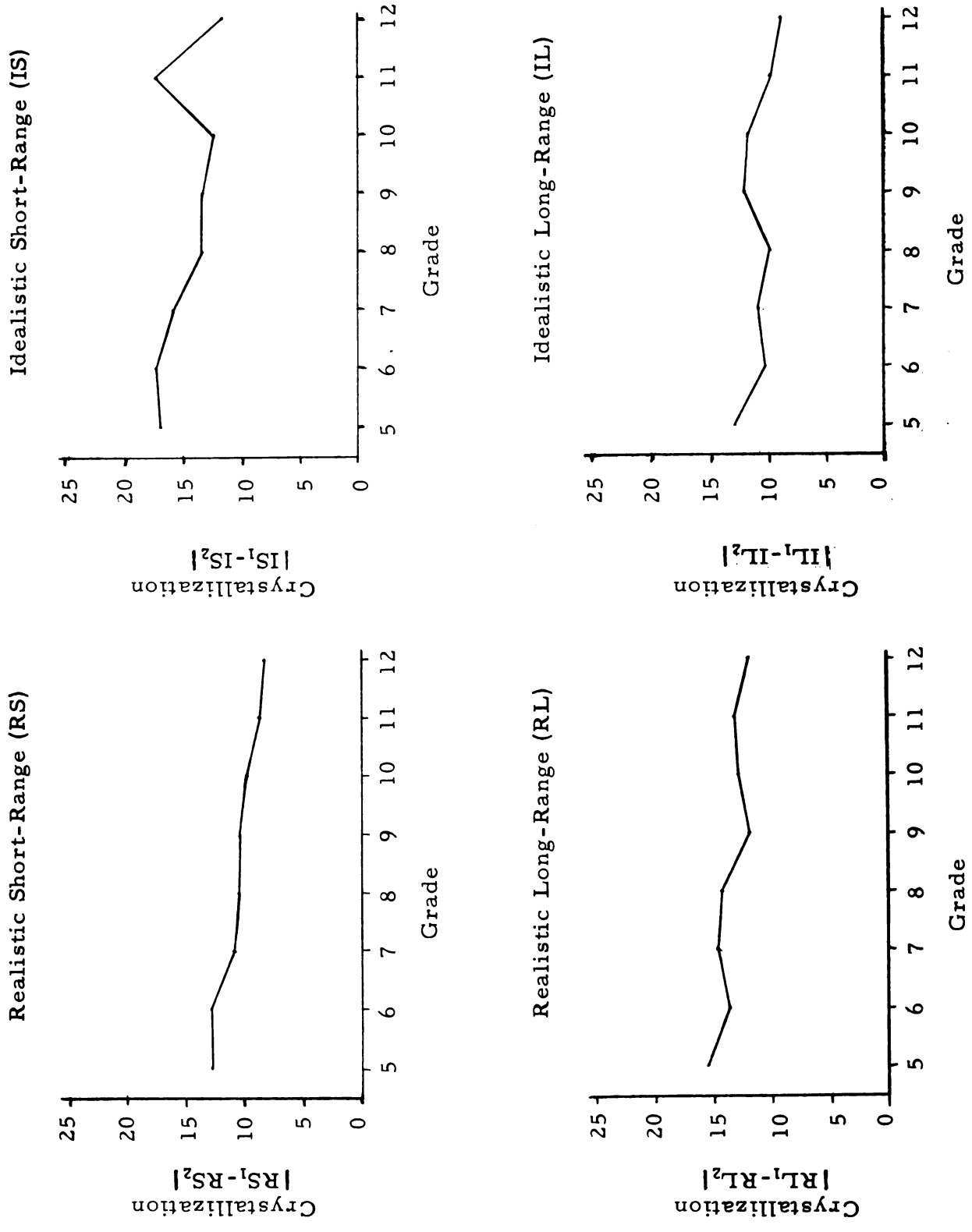
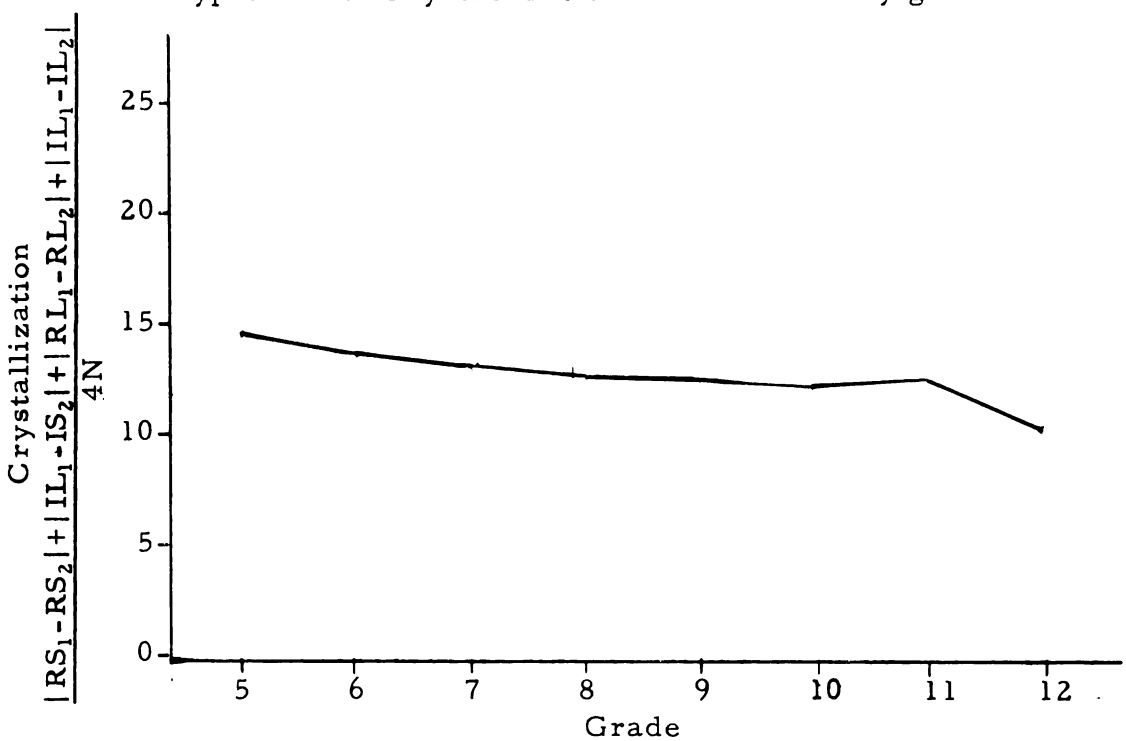


Figure 4

SUMMARY CRYSTALLIZATION OF LOA BY GRADE
(Lower Scores Indicate Greater Crystallization)
N = 380

Hypothesis: Crystallization will increase by grade.



of identical questions on the OAS. The reduction in this discrepancy is notably more regular in the case of the realistic short-range questions than in the others. In the case of the idealistic short-range questions there is sharp upsurge in the trend, followed by a return to the general slope.

In Figure 4 the downward trend in the overall mean is clear; there is only one slight (positive) reversal, at the eleventh grade. This reversal is the result of the IS upsurge mentioned earlier. The mean discrepancy of the fifth graders is 43% greater than that for the twelfth graders, indicating a net increase in crystallization between the fifth and twelfth grades of about 30 per cent.

The pattern of variation by grade in the crystallization of the four components of LOA is shown in Table 3 below.

Table 3. Variances of OAS Crystallization Responses by Grade

	5	6	7	8	9	10	11	12
RS	112.97	81.39	63.48	74.66	88.44	47.24	35.45	40.36
IS	175.62	220.65	196.00	182.14	125.42	150.20	199.40	134.26
RL	151.03	170.93	167.23	156.32	101.46	119.39	108.32	100.14
IL	81.47	93.57	81.64	51.68	69.54	53.71	63.45	36.00

From the above table it is easily seen that the variance in crystallization is substantially greater in IS and RL components than it is in RS and IL components of LOA.

Boy-girl differences are presented in Table 4 and these data are plotted in Figure 5. The pattern of crystallization for the boys differs from that for the girls: 1) in terms of the regularity of the trends, and 2) in terms of the absolute degree of crystallization.

It appears that the means for the boys are slightly less erratic than those for the girls, and it is hence easier to detect a trend to increased crystallization.

The girls show greater absolute crystallization in RS and IL than boys, the opposite being true for IS and RL.

Another interesting fact is that, as will be noted from the last column in Table 4, the greatest mean crystallization is consistently associated with the lowest grand variance. This seems to imply that those persons, regardless of sex, who have high crystallization of LOA also show the least variation among themselves with respect to their degree of crystallization.[1]

[1]The distance of the means from zero does not seem to suggest that any such reduction in variation inheres in the mathematics of crystallization.

Table 4. Crystallization Means and Variances by Grade; Boys, Girls. (Lower Means Indicate Greater Crystallization)

			Grade 5	6	7	8	9	10	11	12	$\overline{X}$
Realistic Short-Range (RS)	Boys	Σ	361	261	272	373	343	336	195	288	2429
		N	23	17	24	34	27	30	20	33	208
		$\overline{X}$	15.70	15.35	11.33	10.97	12.70	11.20	9.75	8.73	11.68
		S^2	132.1	130.4	80.6	88.8	82.9	65.7	32.3	54.3	*83.1
	Girls	Σ	85	318	256	160	188	148	222	130	1507
		N	12	28	25	17	24	20	28	18	172
		$\overline{X}$	7.08	11.35	10.24	9.41	7.83	7.40	7.93	7.22	8.76
		S^2	31.7	49.1	49.0	48.4	85.4	12.5	37.6	14.9	*43.8
Idealistic Short-Range (IS)	Boys	Σ	343	248	267	394	315	307	242	325	2441
		N	23	17	24	34	27	30	20	33	208
		$\overline{X}$	14.91	14.59	11.12	11.59	11.67	10.23	12.10	9.85	11.74
		S^2	117.2	129.9	79.2	130.6	53.5	83.1	89.8	70.4	*92.3
	Girls	Σ	246	523	503	285	363	306	581	263	3069
		N	12	28	25	17	24	20	28	18	172
		$\overline{X}$	20.50	18.68	20.12	16.76	15.13	15.30	20.75	14.61	17.84
		S^2	286.1	276.1	274.9	281.2	205.5	244.3	251.6	246.8	*251.7

*This value is not an average of the foregoing eight values but a separate statistic computed for the eight grades as a single population.

Table 4 (Continued) Crystallization Means and Variances By Grade; Boys, Girls. (Lower Means Indicate Greater Crystallization)

Grade			5	6	7	8	9	10	11	12	$\bar{X}$
Realistic Long-Range (RL)	Boys	Σ	337	200	268	405	279	335	215	426	2465
		N	23	17	24	34	27	30	20	33	208
		$\bar{X}$	14.65	11.76	11.17	11.91	10.33	10.17	10.75	12.91	11.85
		S^2	106.6	116.2	96.0	137.0	83.6	109.8	54.7	82.2	*98.0
	Girls	Σ	203	412	450	322	330	311	412	185	2625
		N	12	28	25	17	24	20	28	18	172
		$\bar{X}$	16.91	14.71	18.00	18.94	13.75	15.55	14.71	10.28	15.26
		S^2	249.9	206.3	218.7	170.9	119.6	128.2	143.3	135.1	*167.4
Idealistic Long-Range (IL)	Boys	Σ	332	175	334	369	375	338	220	310	2453
		N	23	17	24	34	27	30	20	33	208
		$\bar{X}$	14.43	10.29	13.92	10.85	13.89	11.27	11.00	9.39	11.79
		S^2	96.0	76.4	119.9	62.8	111.4	50.3	94.5	43.7	*74.4
	Girls	Σ	119	283	193	128	240	244	255	142	1604
		N	12	28	25	17	24	20	28	18	172
		$\bar{X}$	9.92	10.11	7.72	7.53	10.00	12.20	9.11	7.89	9.33
		S^2	45.2	107.2	28.8	24.1	59.1	61.2	42.4	22.0	*51.8

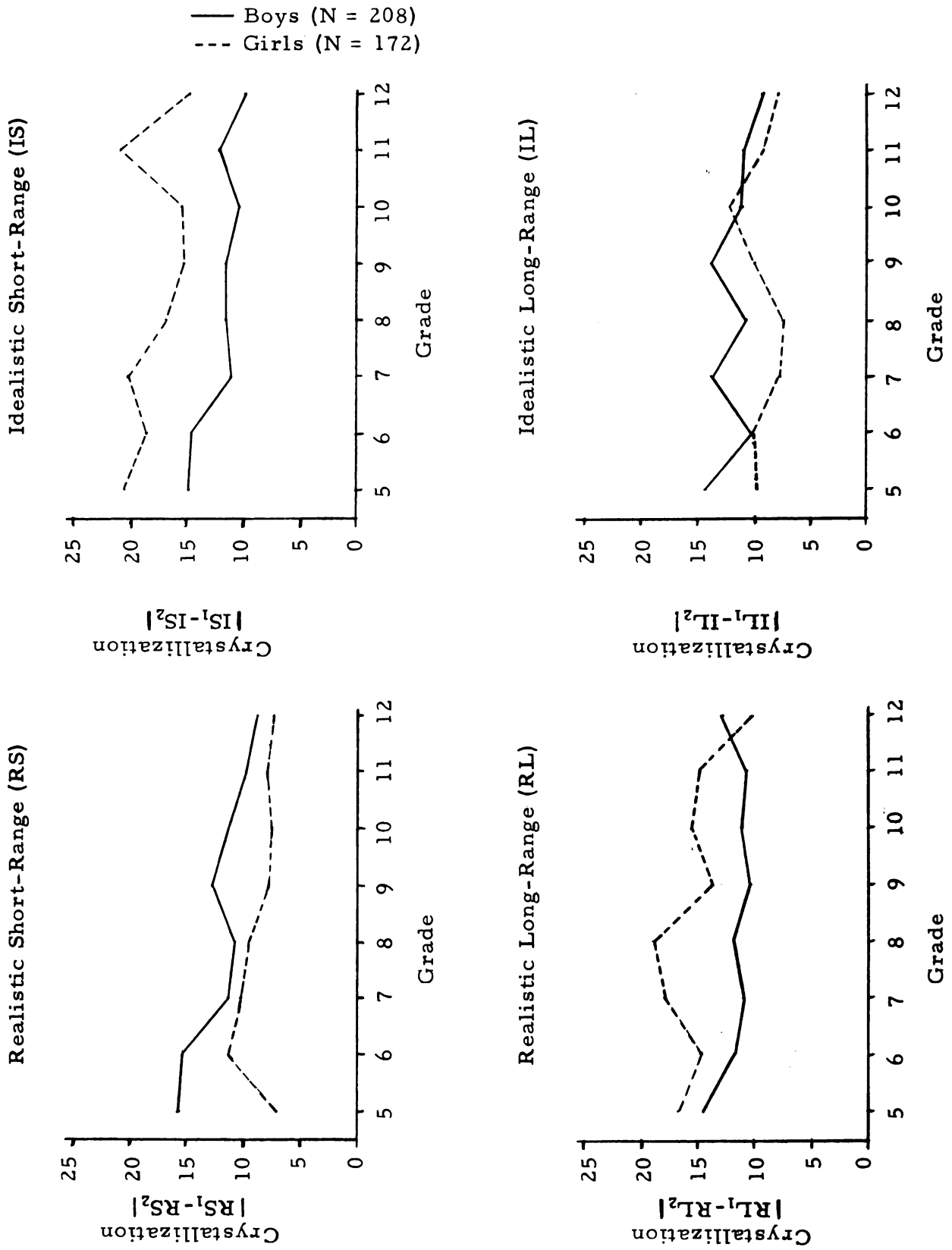
*This value is not an average of the foregoing eight values but a separate statistic computed for the eight grades as a single population.

Figure 5

CRYSTALLIZATION BY GRADE; BOYS, GIRLS

(Lower Scores Indicate Greater Crystallization)

Hypothesis: Crystallization will increase by grade.



With our expectations about the basic crystallization process confirmed, it is now in order to examine the influences of other factors on this process.

Crystallization and Socio-economic Status

The sample was divided into high SES and low SES sub-samples as described in Chapter II, and for this dimension, the hypothesis was as follows:

II. The discrepancy in points between the NORC levels of the (two) responses to each of four sets of identical questions on the Occupational Aspiration Scale made by students in the fifth through the twelfth grades in school will be inversely related to the level of their fathers' occupations on O. D. Duncan, "A Socio-economic Index for All Occupations."

a. At comparable stages in school high SES persons will tend to have smaller group mean discrepancies than low SES persons.

The SES differences are shown in Tables 5, 6, and 7, and these data are plotted in Figures 6, 7, and 8. The results are erratic but the means show the basic declining trend specified by Hypothesis I. The last column of Table 5 shows that of the twelve sets of grand means, eleven follow the SES hypothesis and only one, the RL component for high and low SES boys, does not. There is partial support, then, for Hypothesis II.

It is no doubt true that the relatively small cell size (see Table 6) in many cases contributed to the erratic ups and downs in the means. There is no satisfactory explanation at present, however, for the rather consistent reversal of the relative crystallization of the RL component for boys. In general, girls tend to evidence greater absolute

Table 5. Crystallization by Grade, Boys, Girls, and Boys and Girls of High and Low Socio-economic Status. (Lower Means Indicate Greater Crystallization) Hypothesis: Crystallization will increase by grade, persons of high SES showing the greater crystallization.

Grade		5	6	7	8	9	10	11	12	$\bar{X}$
RS High SES	Boys	13.86	14.67	10.18	12.33	11.33	12.87	8.36	7.74	10.88
	Girls	6.00	11.18	6.00	9.66	5.81	7.37	7.34	7.64	7.62
	All	10.58	12.41	8.30	11.65	8.18	11.04	8.06	7.70	9.39
RS Low SES	Boys	16.50	15.73	12.50	9.47	13.80	7.83	13.00	10.00	12.35
	Girls	7.86	11.47	12.20	9.18	11.87	7.54	8.71	6.57	9.87
	All	13.87	13.14	12.33	9.36	13.13	7.69	10.69	8.74	11.23
IS High SES	Boys	16.71	10.83	11.27	11.80	11.75	7.37	11.50	10.21	10.97
	Girls	22.60	11.45	26.11	4.40	14.00	16.37	21.05	12.72	16.56
	All	19.17	11.24	17.95	9.95	13.03	10.37	17.00	11.13	13.52
IS Low SES	Boys	14.12	16.63	10.92	11.94	11.60	14.83	13.50	7.92	12.58
	Girls	19.00	23.35	14.87	20.18	17.37	15.73	18.86	17.57	18.58
	All	15.61	20.71	13.11	15.18	13.61	15.26	16.38	11.47	15.29

Table 5 (Continued) Crystallization by Grade, Boys, Girls, and Boys and Girls of High and Low Socio-economic Status. (Lower Means Indicate Greater Crystallization) Hypothesis: Crystallization will increase by grade, persons of high SES showing the greater crystallization.

Grade		5	6	7	8	9	10	11	12	$\overline{X}$
RL High SES	Boys	15.71	13.67	13.09	11.13	11.00	12.00	11.78	13.05	12.40
	Girls	7.80	14.91	14.22	14.60	11.81	10.00	11.52	11.36	12.11
	All	12.42	14.47	13.60	12.00	11.46	11.33	11.63	12.43	12.27
RL Low SES	Boys	14.19	10.72	9.58	13.00	9.80	10.58	8.33	12.33	11.41
	Girls	23.43	14.59	19.13	21.82	17.62	19.09	21.00	8.57	18.04
	All	17.00	13.07	14.89	16.46	12.52	14.65	15.15	10.95	14.40
IL High SES	Boys	14.14	6.00	11.54	13.26	12.42	10.75	10.50	9.32	11.06
	Girls	10.80	8.00	5.78	5.20	9.31	13.50	9.37	9.54	9.05
	All	12.75	7.29	8.95	11.25	10.64	11.66	9.85	9.40	10.14
IL Low SES	Boys	14.56	12.64	16.83	9.00	15.07	13.58	12.17	9.25	12.87
	Girls	9.28	11.47	9.07	8.36	11.37	10.36	8.00	5.28	9.47
	All	12.96	11.93	12.52	8.75	13.78	12.04	9.92	7.79	11.34

Table 6. Cell Size by Grade, Boys, Girls, and Boys and Girls of High and Low Socio-economic Status

Grade		5	6	7	8	9	10	11	12	Σ
HIGH SES	Boys	7	6	11	15	12	16	14	19	100
	Girls	5	11	9	5	16	8	19	11	84
	All	12	17	20	20	28	24	33	30	184
LOW SES	Boys	16	11	12	17	15	12	6	12	101
	Girls	7	17	15	11	8	11	7	7	83
	All	23	28	27	28	23	23	13	19	184

Table 7. Grand* Variances of OAS Responses by Grade, Boys, Girls, and Boys and Girls of High and Low Socio-economic Status

Variances:	RS		IS		RL		IL	
	High SES	Low SES	High SES	Low SES	High SES	Low SES	High SES	Low SES
Boys	77.6	89.8	78.5	105.0	94.5	107.2	72.0	76.1
Girls	37.6	49.2	225.3	265.3	129.9	188.9	37.6	67.7
All	61.7	72.6	152.4	185.2	110.1	154.1	57.0	74.8

*These variances are computed for all cases in each cell considered as a single population.

Figure 6

CRYSTALLIZATION BY GRADE, BOYS AND GIRLS OF HIGH AND LOW SOCIO-ECONOMIC STATUS

(Lower Scores Indicate Greater Crystallization)

Hypothesis: Crystallization will increase by grade, boys and girls of high socio-economic status showing the greater crystallization.

—— High SES Boys and Girls (N = 184)

--- Low SES Boys and Girls (N = 184)

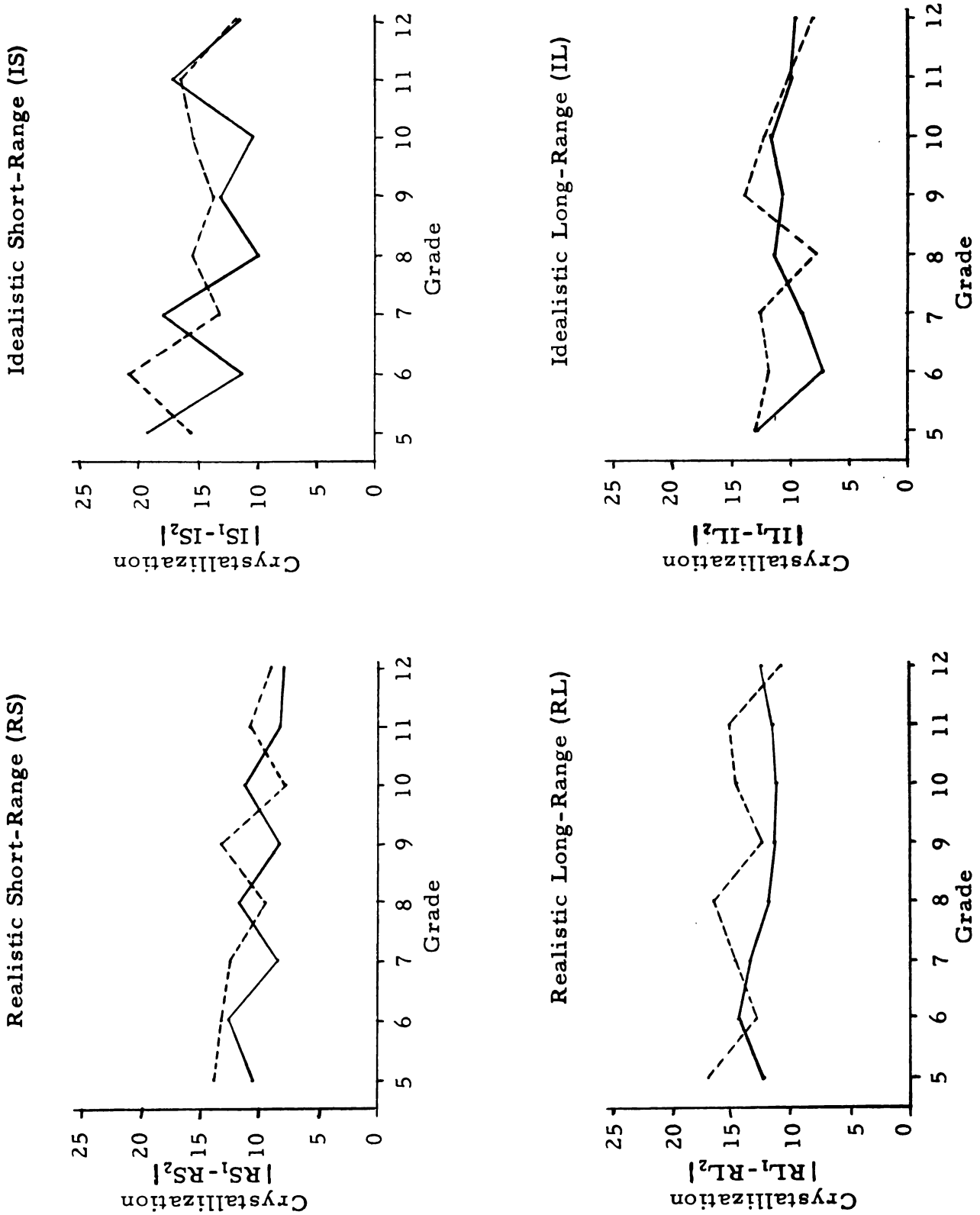


Figure 7

CRYSTALLIZATION BY GRADE, BOYS OF HIGH AND LOW SOCIO-ECONOMIC STATUS

(Lower Scores Indicate Greater Crystallization)

Hypothesis: Crystallization will increase by grade, boys of high socio-economic status showing the greater crystallization.

—— High SES Boys (N = 100) o = N < 10

--- Low SES Boys (N = 101)

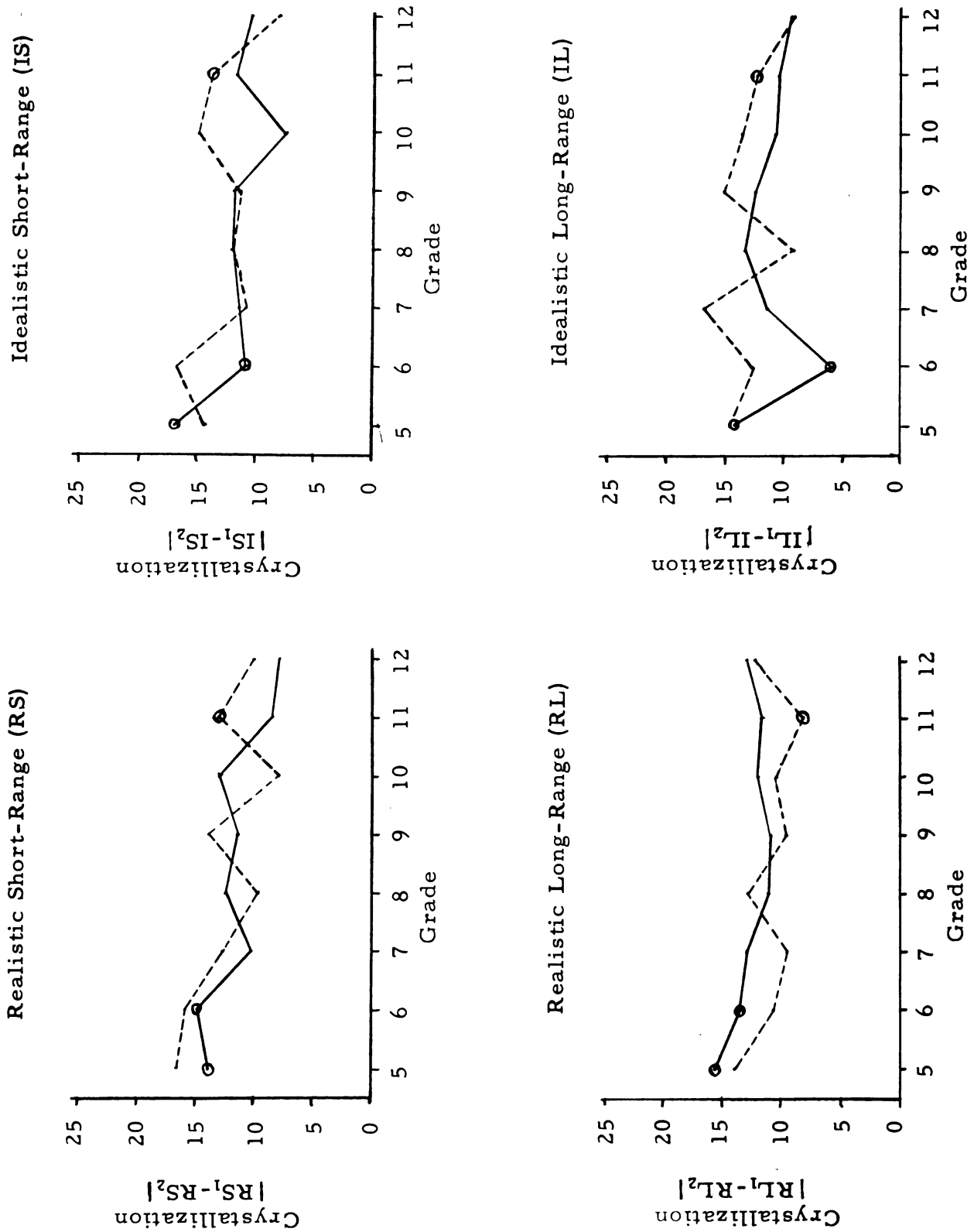
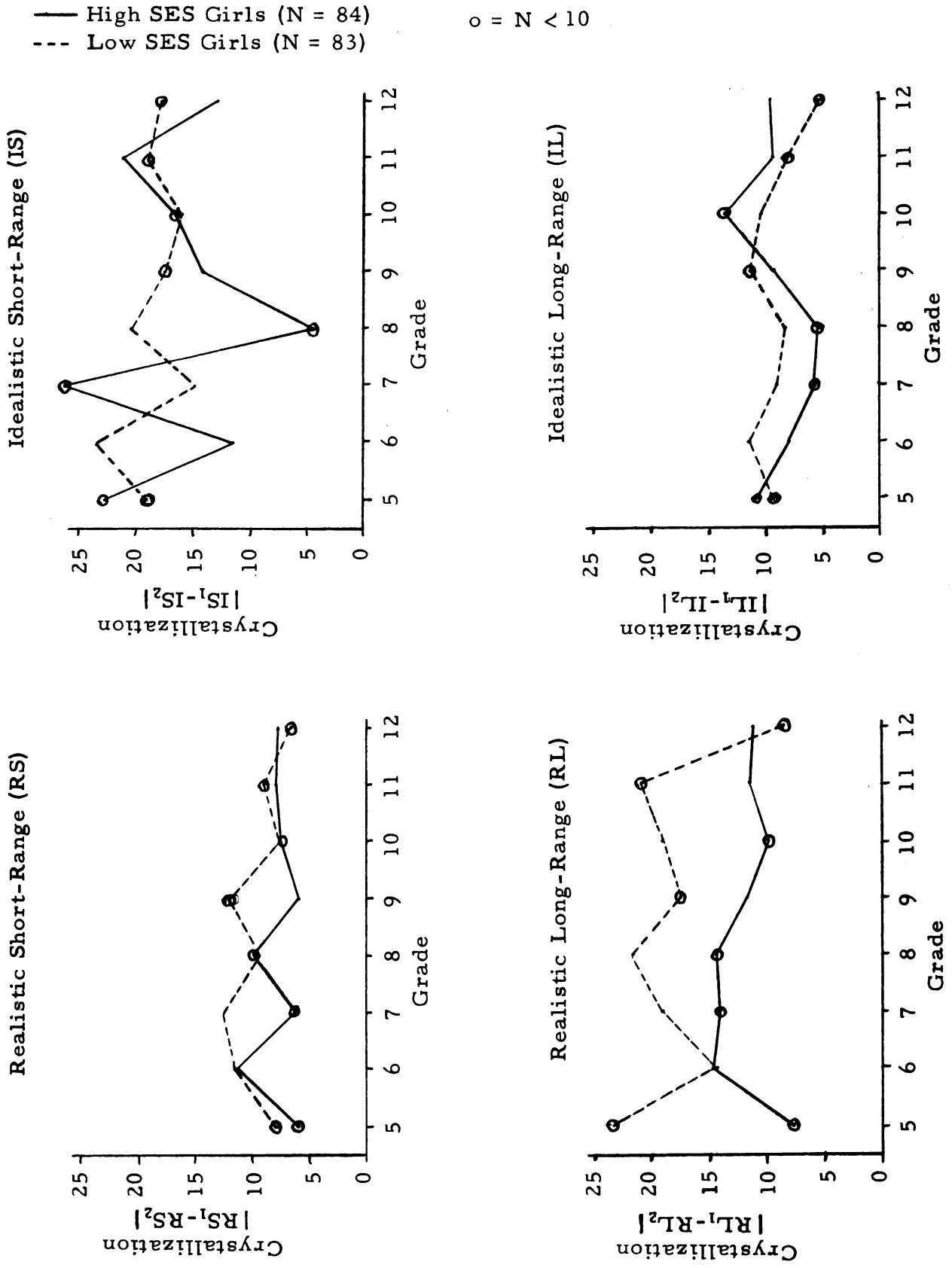


Figure 8

CRYSTALLIZATION BY GRADE, GIRLS OF HIGH AND LOW SOCIO-ECONOMIC STATUS

(Lower Scores Indicate Greater Crystallization)

Hypothesis: Crystallization will increase by grade, girls of high socio-economic status showing the greater crystallization.



crystallization in RS and IL components than boys, the opposite being true for IS and RL components.

Again it is to be noted (see Table 7) that without exception the smaller grand variances are associated with the greater mean crystallizations: persons who have high crystallization of LOA consistently show less variation among themselves than persons with low crystallization of LOA.

Crystallization and Intelligence

Our expectations with respect to the relation between crystallization and intelligence read as follows:

III. The discrepancy in points between the NORC levels of the (two) responses to each of four sets of identical questions on the Occupational Aspiration Scale made by students in the fifth through the twelfth grades in school will be inversely related to these students' scores on IPAT, Test of G: Culture Free.

a. At comparable stages in school, high I.Q. persons will tend to have smaller group mean discrepancies than low I.Q. persons.

The results for crystallization as it related to differential intelligence appear in Tables 8, 9, and 10, and in Figures 9, 10, and 11.

Except in the case of the realistic short-range component, the appearance of a declining trend in crystallization (as predicted by Hypothesis I) seems, at best, argumentive.[1] An examination of Figures 9, 10, and 11, shows that the crystallization trends are very erratic, perhaps more so for the IS component than for any other. It is nevertheless probable that the erratic behavior of the mean is again substantially

[1]However, if the reader will visualize in each graph the probable mean of the two juxtaposed statistics for each grade, the overall trend to increased crystallization will become apparent.

Table 8. Crystallization by Grade, Boys, Girls, and Boys and Girls of High and Low Intelligence. (Lower Means Indicate Greater Crystallization) Hypothesis: Crystallization will increase by grade, persons of high I. Q. showing the greater crystallization.

Grade		5	6	7	8	9	10	11	12	$\overline{X}$
RS High I. Q.	Boys	17.78	5.00	8.44	10.80	10.92	12.00	9.06	9.00	10.60
	Girls	5.60	10.50	10.44	4.50	7.00	7.67	7.60	5.92	7.62
	All	13.43	9.40	9.45	10.13	9.32	10.56	8.25	8.05	9.41
RS Low I. Q.	Boys	14.36	16.73	13.07	11.21	14.36	10.00	12.50	7.50	12.99
	Girls	8.14	11.70	10.13	10.92	8.33	7.18	8.75	9.83	9.67
	All	12.29	13.86	11.55	11.07	11.24	8.65	10.00	8.67	11.31
IS High I. Q.	Boys	18.44	19.00	8.56	12.15	13.62	6.56	10.63	10.00	11.04
	Girls	24.00	11.38	18.67	6.25	12.89	11.22	18.65	13.92	15.27
	All	20.43	12.90	13.61	11.17	13.22	8.11	15.08	11.21	12.74
IS Low I. Q.	Boys	12.64	14.00	12.67	10.79	9.86	15.75	18.00	9.17	12.57
	Girls	18.00	21.60	20.94	19.92	16.47	18.64	26.00	16.00	19.88
	All	14.43	18.34	16.94	15.18	13.28	17.13	23.33	12.58	16.26

Table 8 (Continued) Crystallization by Grade, Boys, Girls, and Boys and Girls of High and Low Intelligence. (Lower Means Indicate Greater Crystallization) Hypothesis: Crystallization will increase by grade, persons of high I. Q. showing the greater crystallization.

Grade		5	6	7	8	9	10	11	12	$\overline{X}$
RL High I. Q.	Boys	14.33	10.00	8.44	13.05	7.07	9.61	10.44	12.19	10.94
	Girls	14.20	11.12	11.22	12.50	9.44	17.89	13.30	6.50	11.99
	All	14.28	10.90	9.83	12.96	8.04	12.37	12.03	10.69	11.35
RL Low I. Q.	Boys	14.86	12.00	12.80	10.29	13.36	13.50	12.00	16.16	12.96
	Girls	18.85	16.15	21.81	20.92	16.33	13.64	18.25	16.16	17.85
	All	16.19	14.37	17.45	15.41	14.89	13.56	16.17	16.17	15.43
IL High I. Q.	Boys	13.56	2.50	11.56	9.40	13.77	11.00	9.87	10.15	10.77
	Girls	8.20	6.38	7.11	4.50	7.00	8.44	8.70	7.58	7.61
	All	11.64	5.60	9.33	8.58	11.00	10.15	9.22	9.36	9.51
IL Low I. Q.	Boys	15.00	11.33	15.33	12.92	14.00	11.67	15.50	6.00	13.03
	Girls	11.14	11.60	8.06	8.46	11.80	15.27	10.12	8.50	10.69
	All	13.71	11.48	11.58	10.78	12.86	13.39	11.92	7.25	11.84

Table 9. Cell Size by Grade, Boys, Girls, and Boys and Girls of High and Low Intelligence

Grade		5	6	7	8	9	10	11	12	Σ
HIGH I.Q.	Boys	9	2	9	20	13	18	16	27	114
	Girls	5	8	9	4	9	9	20	12	76
	All	14	10	18	24	22	27	36	39	190
LOW I.Q.	Boys	14	15	15	14	14	12	4	6	94
	Girls	7	20	16	13	15	11	8	6	96
	All	21	35	31	27	29	23	12	12	190

Table 10. Grand* Variances of OAS Responses by Grade, Boys, Girls, and Boys and Girls of High and Low Intelligence

Variances:	RS		IS		RL		IL	
	High I.Q.	Low I.Q.	High I.Q.	Low I.Q.	High I.Q.	Low I.Q.	High I.Q.	Low I.Q.
Boys	70.7	96.0	86.5	99.1	88.7	108.1	65.7	83.0
Girls	26.0	56.5	215.0	273.9	145.9	183.3	29.4	65.9
All	54.7	78.4	141.4	199.8	104.9	151.4	53.4	75.3

*These variances are computed for all cases in each cell considered as a single population.

Figure 9

CRYSTALLIZATION BY GRADE, BOYS AND GIRLS OF HIGH AND LOW INTELLIGENCE

(Lower Scores Indicate Greater Crystallization)

Hypothesis: Crystallization will increase by grade, boys and girls of high intelligence showing the greater crystallization.

—— High I. Q. Boys and Girls (N = 190)
--- Low I. Q. Boys and Girls (N = 190)

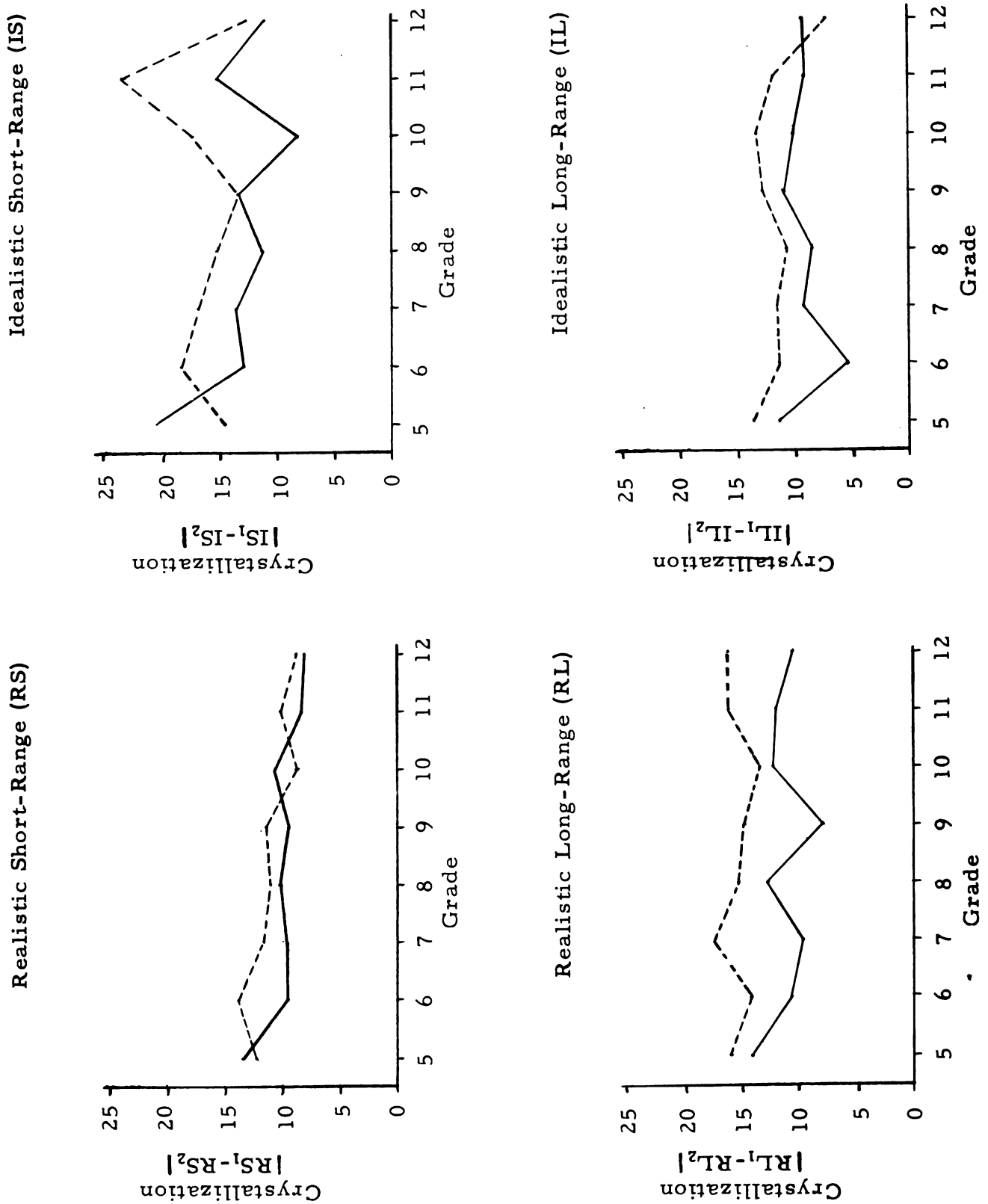
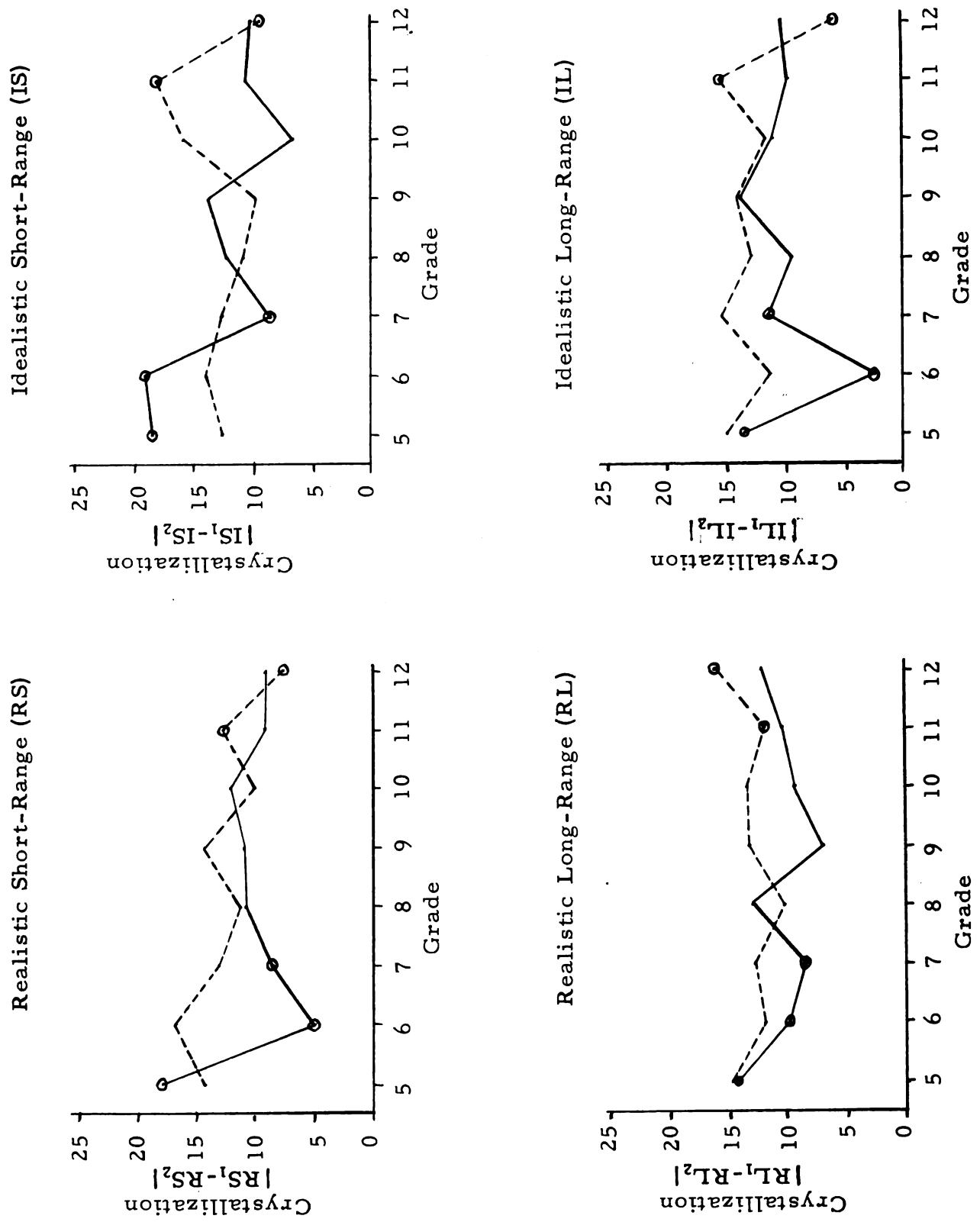


Figure 10
CRYSTALLIZATION BY GRADE, BOYS OF HIGH AND LOW INTELLIGENCE

(Lower Scores Indicate Greater Crystallization)

Hypothesis: Crystallization will increase by grade, boys of high intelligence showing the greater crystallization.

—— High I.Q. Boys (N = 114) o = N < 10.
--- Low I.Q. Boys (N = 94)



CRYSTALLIZATION BY GRADE, GIRLS OF HIGH AND LOW INTELLIGENCE

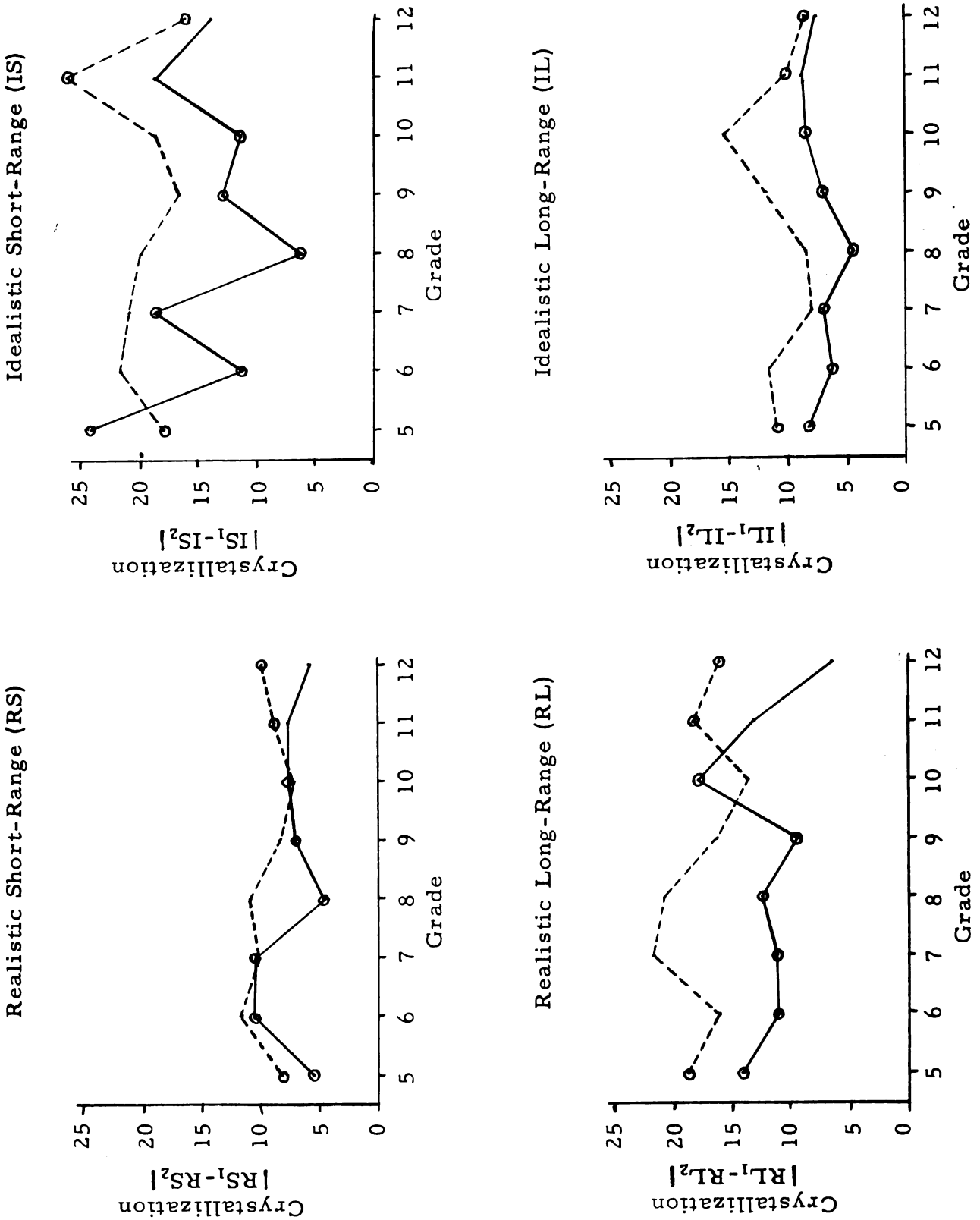
(Lower Scores Indicate Greater Crystallization)

Hypothesis: Crystallization will increase by grade, girls of high intelligence showing the greater crystallization.

—— High I. Q. Girls (N = 76)

--- Low I. Q. Girls (N = 96)

o = N < 10



the result of small cell sizes (see Table 9). In the sixth grade, for example, the cell size is only 2 for the high I.Q. boys, and the effect their responses has on the appearance of the graphic trends is easily seen from Figure 10.

Apart, here, from the issue of trends as they bear on Hypothesis I is the question of the validity of Hypothesis III. From the tables and graphs it is evident that in all four components and for both boys and girls the hypothesis is supported. The grand mean discrepancies for low I.Q. persons are consistently greater than for their high I.Q. counterparts. Girls show a greater absolute crystallization in RS and IL components than boys, the contrary tendency prevailing in IS and RL components.

Examination of Table 10 reveals that, as shown before, high mean crystallization of LOA is associated with low grand variance of responses.

Crystallization and Grade Point Average

The hypothesis made about the influence of GPA on the crystallization process was as follows:

IV. The discrepancy in points between the NORC levels of the (two) responses to each of four sets of identical questions on the Occupational Aspiration Scale made by students in the fifth through the twelfth grades in school will be inversely related to these students' grade point average percentile rankings.

a. At comparable stages in school high GPA persons will tend to have smaller group mean discrepancies than low GPA persons.

The data for the grade point average differentials in crystallization are to be found in Tables 11, 12, and 13. These results are plotted in Figures 12, 13, and 14.

Table 11. Crystallization by Grade, Boys, Girls, and Boys and Girls of High and Low Grade Point Average (Lower Means Indicate Greater Crystallization) Hypothesis: Crystallization will increase by grade, persons of high GPA showing the greater crystallization.

Grade		5	6	7	8	9	10	11	12	$\bar{X}$
RS High GPA	Boys	15.09	16.36	11.00	9.94	10.75	15.67	9.62	8.87	11.98
	Girls	5.83	8.09	8.30	14.50	5.71	6.77	8.47	5.73	7.16
	All	11.82	12.23	9.83	9.43	8.04	11.04	8.87	7.54	9.72
RS Low GPA	Boys	16.25	13.50	11.00	12.29	14.27	8.22	8.54	8.61	11.27
	Girls	8.33	13.47	11.57	9.00	10.80	8.57	5.36	9.57	10.10
	All	13.61	13.48	11.33	11.33	12.88	8.32	6.95	8.88	10.77
IS High GPA	Boys	17.09	12.54	7.46	13.63	11.83	7.42	8.37	9.40	11.02
	Girls	25.17	13.63	20.90	15.00	13.86	13.15	20.47	14.64	16.64
	All	19.94	13.09	13.30	14.04	12.92	10.40	16.26	11.61	13.66
IS Low GPA	Boys	12.91	18.33	15.70	9.94	11.53	12.11	15.09	10.22	12.45
	Girls	15.83	21.94	18.64	19.43	16.90	19.28	21.45	14.57	19.07
	All	13.89	21.00	17.42	12.71	13.68	14.12	18.27	11.44	15.26

Table 11 (Continued) Crystallization by Grade, Boys, Girls, and Boys and Girls of High and Low Grade Point Average. (Lower Means Indicate Greater Crystallization) Hypothesis: Crystallization will increase by grade, persons of high GPA showing the greater crystallization.

Grade		5	6	7	8	9	10	11	12	$\bar{X}$
RL High GPA	Boys	18.36	10.45	7.92	6.81	9.83	10.17	11.37	13.07	10.77
	Girls	10.33	10.18	12.70	12.14	8.50	18.62	11.33	5.91	11.29
	All	15.53	10.32	10.00	8.43	9.12	14.56	11.35	10.04	11.02
RL Low GPA	Boys	11.25	14.17	16.10	16.00	10.73	11.83	11.00	12.78	12.88
	Girls	23.50	17.65	20.36	23.00	21.10	9.86	18.54	17.14	18.87
	All	15.33	16.74	18.58	18.04	14.88	11.28	14.77	14.00	15.42
IL High GPA	Boys	12.00	8.54	11.69	10.87	9.08	9.92	8.37	7.60	9.81
	Girls	11.00	5.27	7.60	6.43	8.00	10.69	9.67	8.73	8.47
	All	11.65	6.91	9.91	9.52	8.50	10.32	9.22	8.08	9.18
IL Low GPA	Boys	16.67	13.50	16.60	10.94	17.13	12.17	11.27	10.89	13.44
	Girls	8.83	13.23	7.64	9.00	12.80	15.00	9.09	6.57	10.47
	All	14.06	13.30	11.37	10.37	15.76	12.96	10.18	9.68	12.18

Table 12. Cell Size by Grade, Boys, Girls, and Boys and Girls of High and Low Grade Point Average

Grade		5	6	7	8	9	10	11	12	Σ
HIGH GPA	Boys	11	11	13	16	12	12	8	15	98
	Girls	6	11	10	4	14	13	15	11	87
	All	17	22	23	23	26	25	23	26	185
LOW GPA	Boys	12	6	10	17	15	18	11	18	107
	Girls	6	17	14	7	10	7	11	7	79
	All	18	23	24	24	25	25	22	25	186

Table 13. Grand* Variances of OAS Responses by Grade, Boys, Girls, and Boys and Girls of High and Low Grade Point Average

	RS		IS		RL		IL	
Variances:	High GPA	Low GPA	High GPA	Low GPA	High GPA	Low GPA	High GPA	Low GPA
Boys	90.8	76.6	97.7	89.6	96.8	98.0	66.4	75.1
Girls	30.0	52.1	226.1	284.4	100.5	197.7	38.9	67.0
All	67.7	66.2	165.1	182.0	98.1	149.6	53.6	73.5

*These variances are computed for all cases in each cell considered as a single population.

Figure 12

CRYSTALLIZATION BY GRADE, BOYS AND GIRLS OF HIGH AND LOW GRADE POINT AVERAGE

(Lower Scores Indicate Greater Crystallization)

Hypothesis: Crystallization will increase by grade, boys and girls of high GPA showing the greater crystallization.

—— High GPA Boys and Girls (N= 185)
----Low GPA Boys and Girls (N = 186)

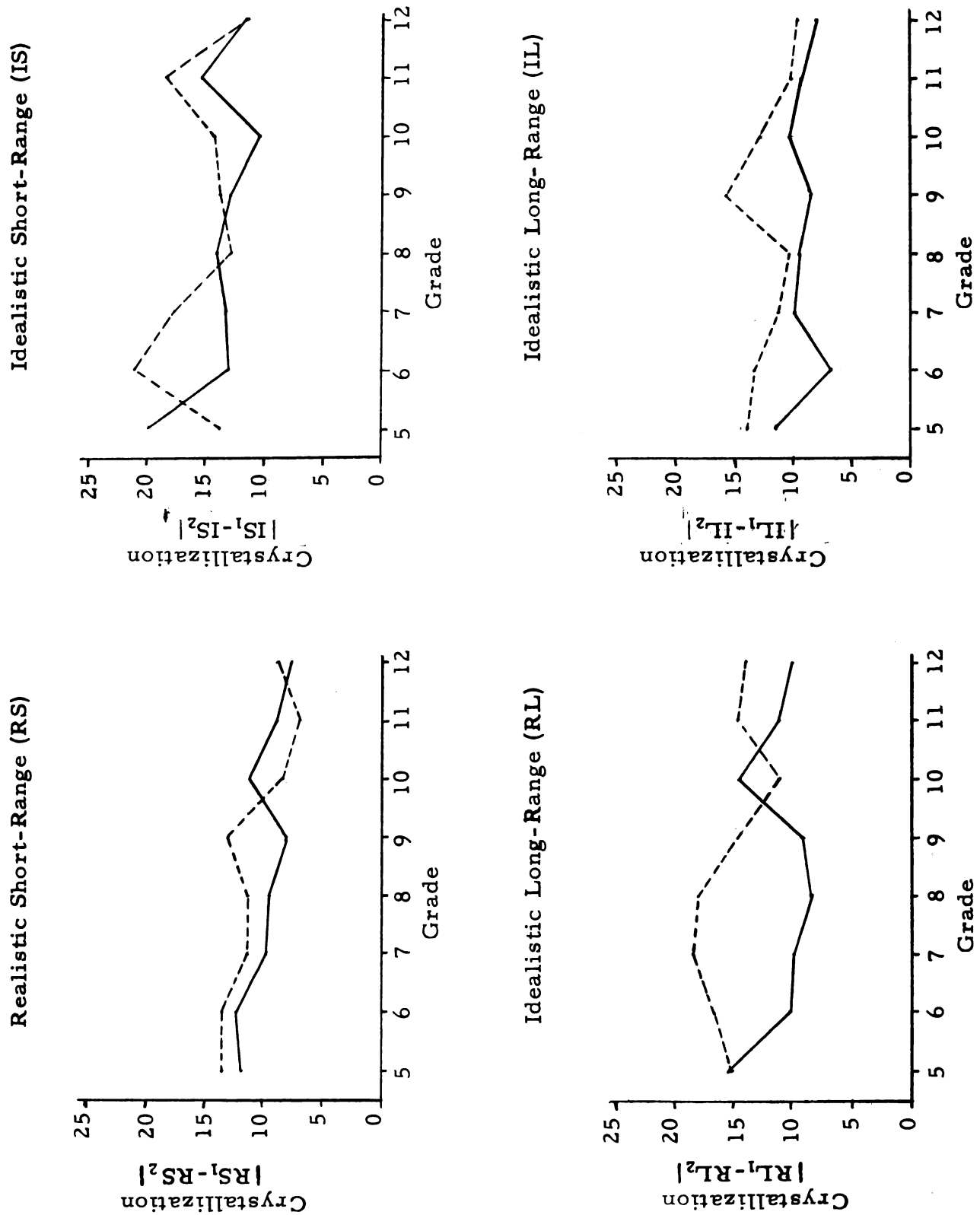


Figure 13

CRYSTALLIZATION BY GRADE, BOYS OF HIGH AND LOW GRADE POINT AVERAGE

(Lower Scores Indicate Greater Crystallization)

Hypothesis: Crystallization will increase by grade, boys of high GPA showing the greater crystallization.

—— High GPA Boys (N = 98) o = N < 10

--- Low GPA Boys (N = 107)

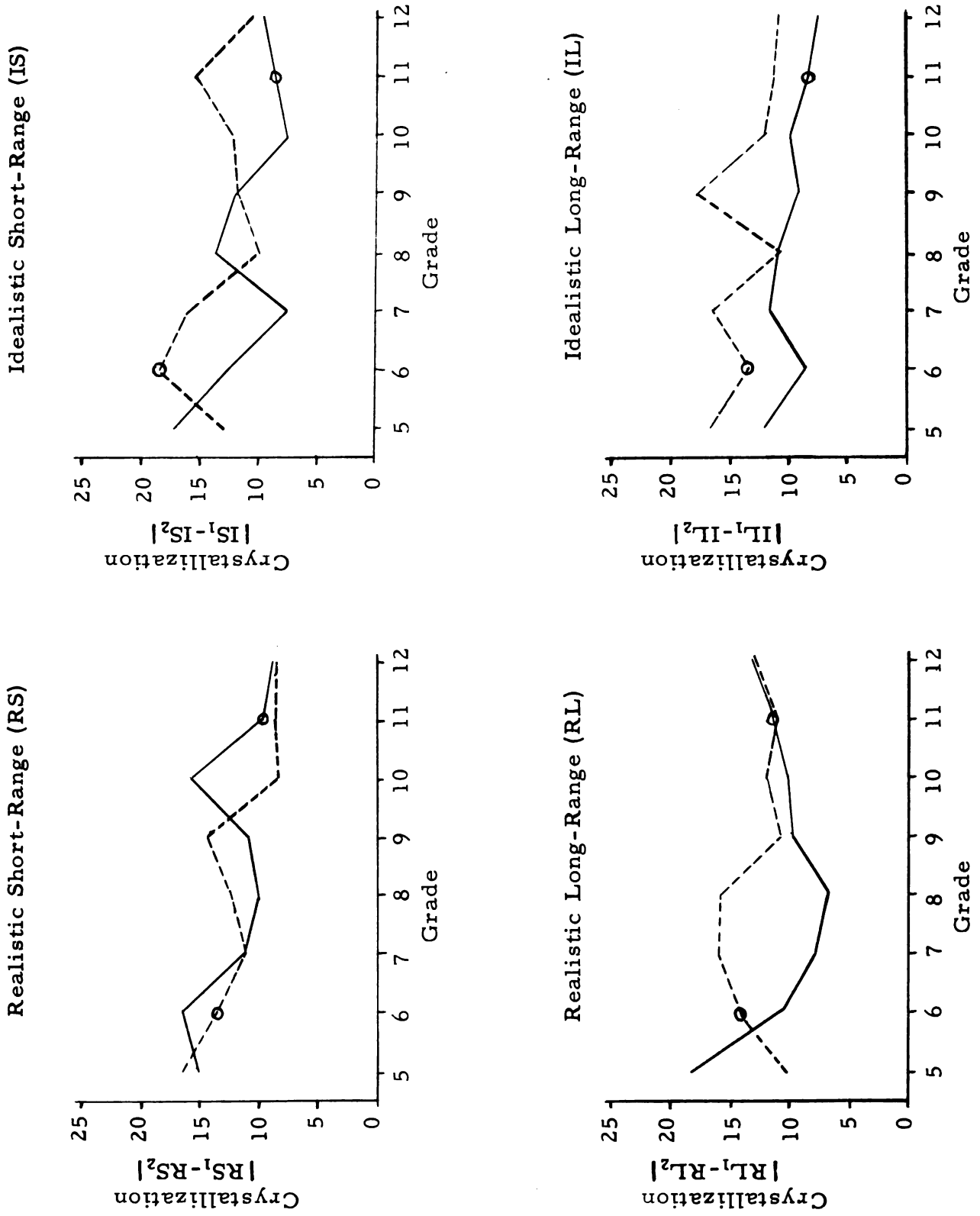
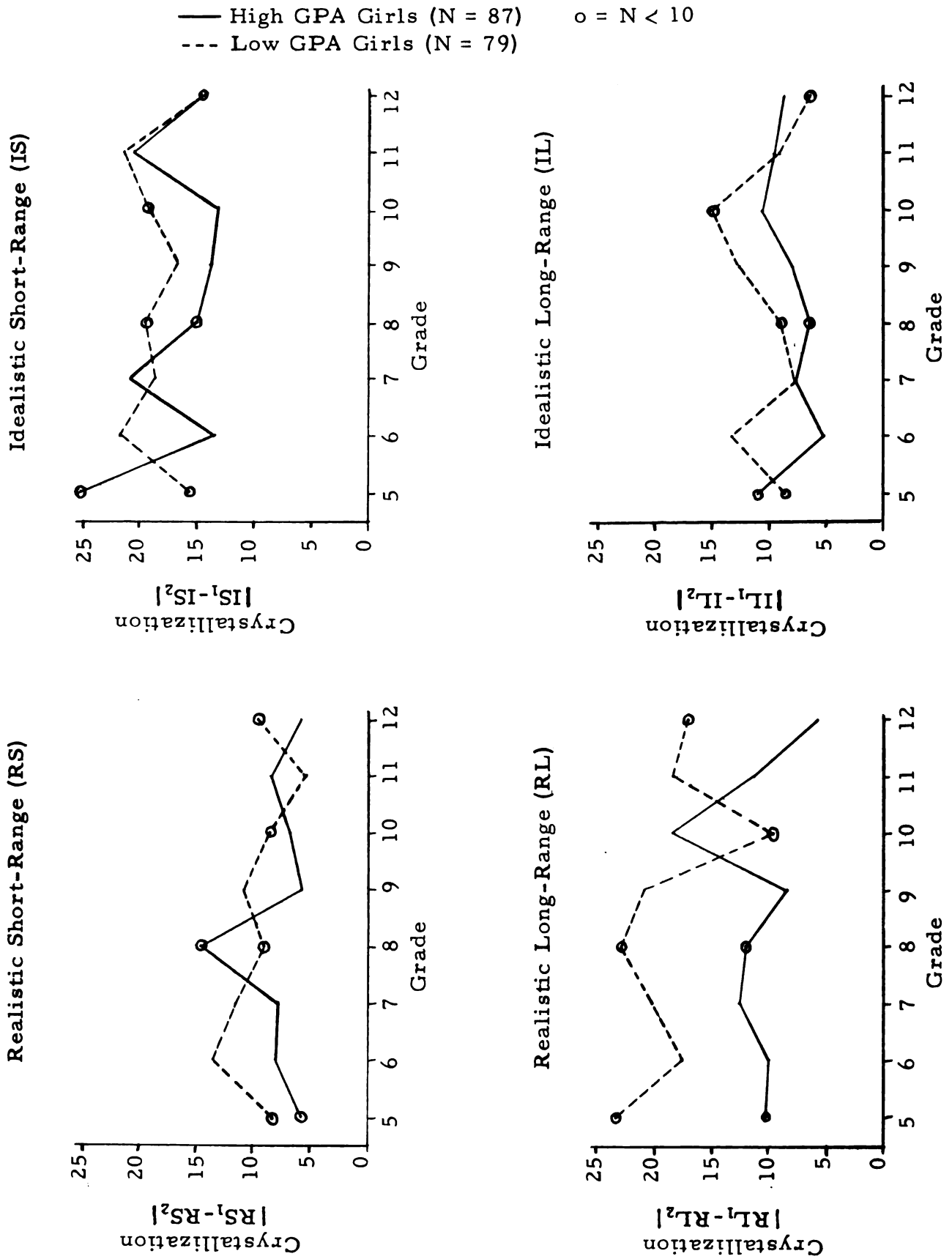


Figure 14

CRYSTALLIZATION BY GRADE, GIRLS OF HIGH AND LOW GRADE POINT AVERAGE

(Lower Scores Indicate Greater Crystallization)

Hypothesis: Crystallization will increase by grade, girls of high grade point average showing the greater crystallization.



In general, the support for Hypothesis I is more apparent in these results than in the case of the breakdown by intelligence. Again, also, it is true that the trends in the RS component are perceptibly less erratic than for the other OAS components.

With one reversal, in the RS component for high and low GPA boys, the data support Hypothesis IV. In all but the instance just mentioned, the grand means (see last column, Table 11) indicate greater crystallization for high GPA persons than for low GPA persons. It is admitted that the small cell sizes will have had the same consequence for this as for the other dimensions.

Consistent with the previous pattern of boy-girl differences, the absolute crystallization of RS and IL for girls is greater than that for boys, and the girls' IS and RL crystallization less than the boys'.

The tendency of the grand variances generally replicates the previous pattern, but with some reversals. In the crystallization of both the RS and IS components, boys of low GPA show less variation among themselves than do high GPA boys. The reason for this exception is not known.

Combined Effects of SES, I.Q., and GPA Factors on Crystallization

For the illustration of the combined influence of SES, I.Q., and GPA on the degree of crystallization in OAS responses, those cases in which an individual ranked high on all three indexes or low on all three indexes were sorted out and compared. The cell size (see Table 14 below) was understandably even smaller than under the original conditions; hence, only the grossest inferences may be made from the data.

Table 14. Cell Size by Grade, Boys, Girls, and Boys and Girls of High and Low SES, I.Q., and GPA

	Grade	5	6	7	8	9	10	11	12	Σ
High	Boys	5	2	3	5	2	7	5	6	35
	Girls	3	6	5	2	8	4	10	7	43
	All	8	8	8	7	8	11	15	13	78
Low	Boys	7	5	2	3	5	4	1	1	28
	Girls	4	13	9	5	5	4	2	2	44
	All	11	18	11	8	10	8	3	3	72

The results of the comparison of high and low groups are presented in Table 15 and in Figures 15, 16, and 17.

Despite the small cell size, the increase in crystallization is apparent in a majority of the graphs as predicted by Hypothesis I. Moreover, the differentials predicted by Hypotheses II, III, and IV are even more dramatically shown when the effects of these factors are combined. Persons who rank high in SES, I.Q., and GPA have notably smaller group mean discrepancies than persons who rank low. The overall crystallization mean for the high SES-I.Q.-GPA group is 10.23 while that for the low SES-I.Q.-GPA group is 15.25, making the effects of these factors very clear.

General Conclusions

From the foregoing presentation of the results of the tests it may be concluded that the mean discrepancy in points between the NORC levels of responses to identical questions on the OAS made by students in the fifth through the twelfth grades declines as grade increases. This is to

Table 15. Crystallization by Grade, Boys, Girls, and Boys and Girls of High and Low SES, I.Q., and GPA. (Lower Means Indicate Greater Crystallization) Hypothesis: Crystallization will increase by grade, persons of high SES, I.Q., and GPA showing the greater crystallization.

Grade		5	6	7	8	9	10	11	12	$\bar{X}$
RS High SES I.Q. GPA	Boys	17.00	5.00	8.00	9.60	10.50	15.86	9.60	7.67	11.23
	Girls	6.00	9.67	7.00	4.00	7.50	6.50	6.00	6.14	6.81
	All	12.88	8.50	7.38	8.00	8.25	12.45	7.20	6.85	8.79
RS Low SES I.Q. GPA	Boys	16.14	14.00	17.50	8.33	17.20	5.25	14.00	6.00	13.21
	Girls	10.00	13.23	10.56	9.20	15.40	6.75	8.00	9.00	11.16
	All	13.91	13.44	11.82	8.88	16.30	6.00	10.00	8.00	11.96
IS High SES I.Q. GPA	Boys	21.20	19.00	7.33	14.60	13.00	4.14	9.40	10.67	11.57
	Girls	21.00	9.33	28.20	4.00	13.50	18.25	19.50	13.71	16.52
	All	21.13	11.75	20.38	11.57	13.38	9.27	16.13	12.31	14.33
IS High SES I.Q. GPA	Boys	12.57	20.60	28.50	15.33	9.00	22.75	26.00	13.00	16.75
	Girls	11.25	23.62	20.11	18.80	20.80	27.75	21.50	26.00	21.30
	All	12.09	22.78	21.64	17.50	14.90	25.25	23.00	21.67	19.53

Table 15 (Continued) Crystallization by Grade, Boys, Girls, and Boys and Girls of High and Low SES, I.Q., and GPA (Lower Means Indicate Greater Crystallization) Hypothesis: Crystallization will increase by grade, persons of high SES, I.Q., and GPA showing the greater crystallization.

Grade		5	6	7	8	9	10	11	12	$\bar{X}$
RL High SES I.Q. GPA	Boys	15.60	10.00	10.00	7.40	15.00	8.00	15.00	11.67	11.31
	Girls	11.00	8.50	9.40	4.50	10.17	12.50	7.40	7.29	8.74
	All	13.88	8.88	9.63	6.57	11.38	9.64	9.93	9.31	9.90
RL Low SES I.Q. GPA	Boys	11.00	10.00	22.50	14.00	13.60	14.50	15.00	12.00	13.11
	Girls	25.75	15.38	22.67	25.80	23.40	10.00	21.00	11.50	19.50
	All	16.36	13.89	22.64	21.38	18.50	12.25	19.00	11.67	17.01
IL High SES I.Q. GPA	Boys	13.00	2.50	7.00	7.40	3.00	8.57	3.40	8.33	7.46
	Girls	10.00	6.50	5.40	3.00	7.67	11.50	9.80	9.14	8.28
	All	11.88	5.50	6.00	6.14	6.50	9.64	7.67	8.77	7.91
IL Low SES I.Q. GPA	Boys	17.71	16.00	24.50	7.00	17.40	12.75	3.00	1.00	14.86
	Girls	10.25	14.08	7.00	8.60	14.80	14.50	6.00	5.00	11.00
	All	15.00	14.61	10.18	8.00	16.10	13.63	5.00	3.67	12.50

Figure 15

CRYSTALLIZATION BY GRADE: BOYS AND GIRLS OF HIGH AND LOW SOCIO-ECONOMIC STATUS, INTELLIGENCE, AND GRADE POINT AVERAGE

(Lower Scores Indicate Greater Crystallization)

Hypothesis: Crystallization will increase by grade, boys and girls of high SES, I.Q., and GPA showing the greater crystallization.

—— High SES, I.Q., GPA Boys and Girls (N = 78)
--- Low SES, I.Q., GPA Boys and Girls (N = 72)

o = N < 10

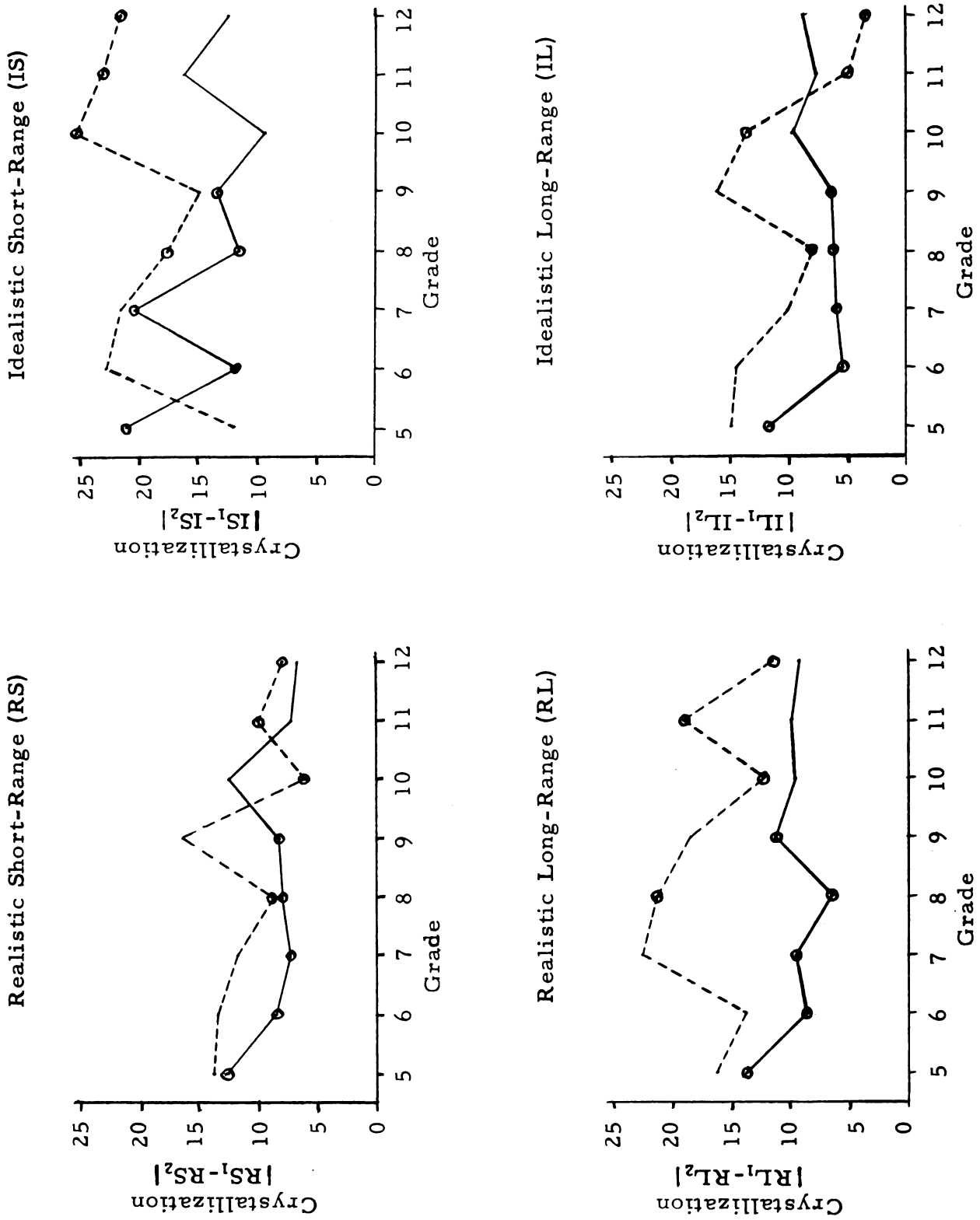


Figure 16

CRYSTALLIZATION BY GRADE, BOYS OF HIGH AND LOW SOCIO-ECONOMIC STATUS, INTELLIGENCE, AND GRADE POINT AVERAGE

(Lower Scores Indicate Greater Crystallization)

Hypothesis: Crystallization will increase by grade, boys of high SES, I.Q., and GPA showing the greater crystallization.

—— High SES, I.Q., GPA Boys (N = 35) o = N < 10

--- Low SES, I.Q., GPA Boys (N = 28)

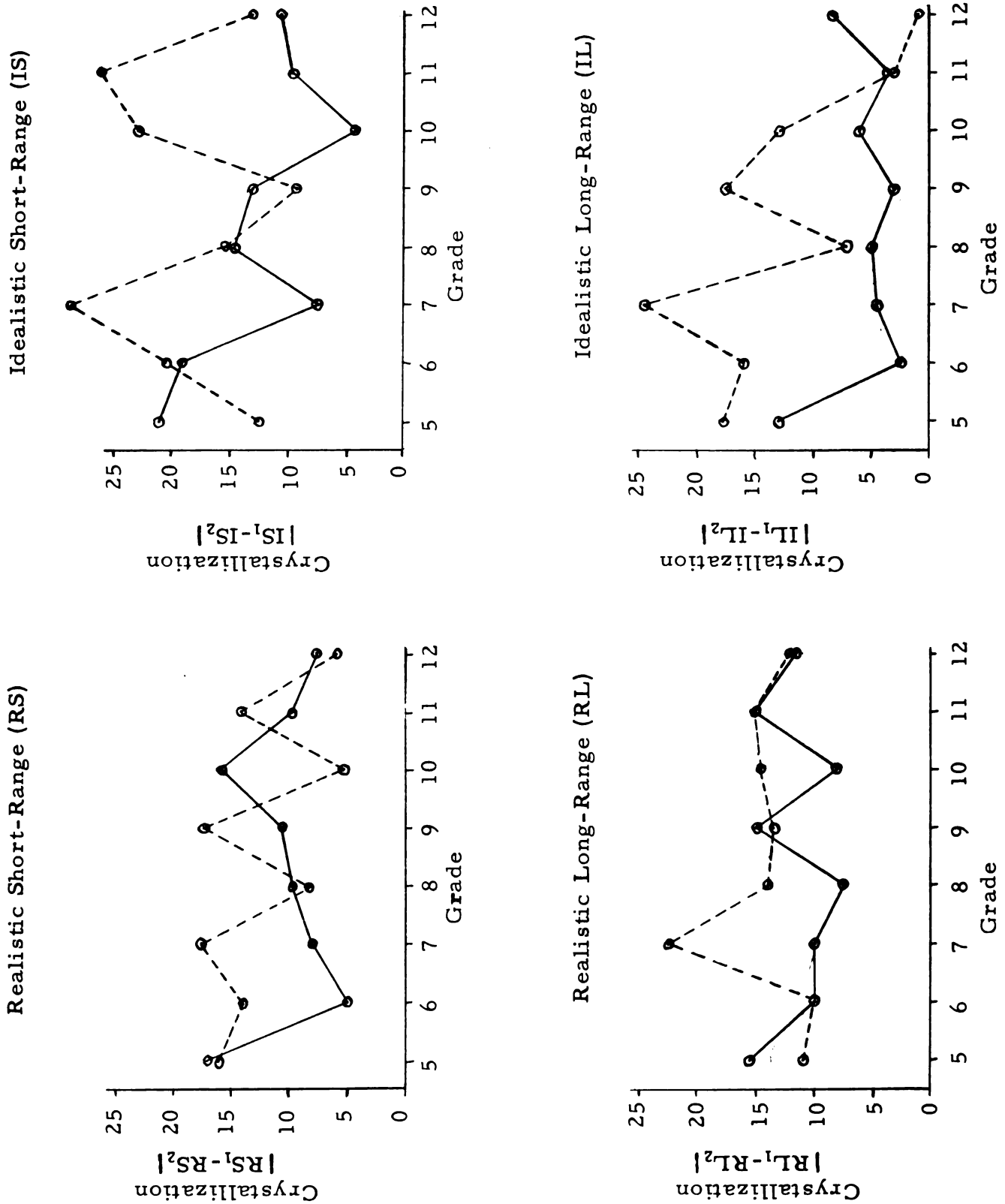


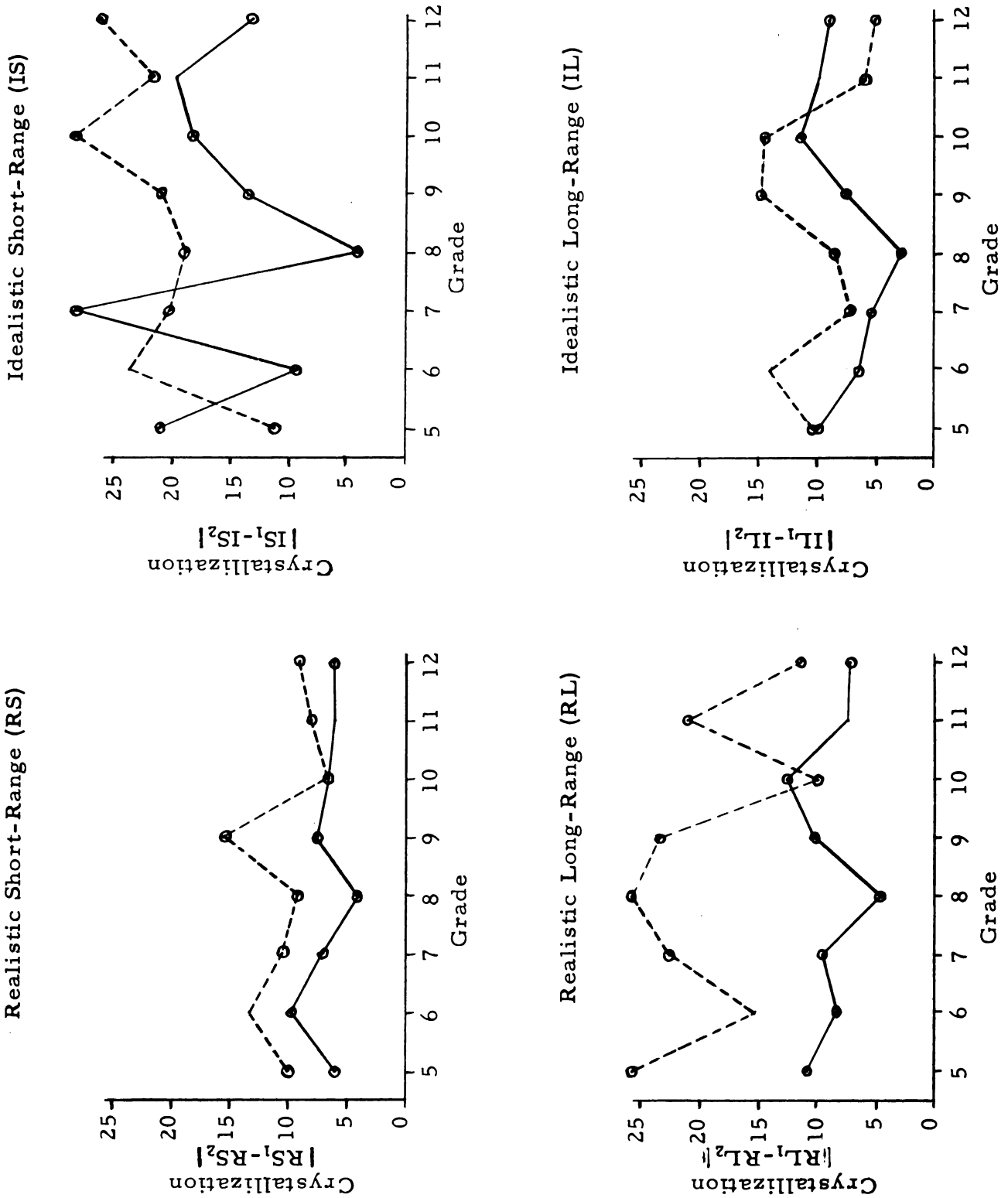
Figure 17
CRYSTALLIZATION BY GRADE, GIRLS OF HIGH AND LOW SOCIO-ECONOMIC STATUS, INTELLIGENCE, AND GRADE POINT AVERAGE

(Lower Scores Indicate Greater Crystallization)

Hypothesis: Crystallization will increase by grade, girls of high SES, I.Q., and GPA showing the greater crystallization.

——High SES, I.Q., GPA Girls (N = 43)
---Low SES, I.W., GPA Girls (N = 44)

0 = N < 10



say that crystallization in the levels of occupational aspiration of students in the fifth through the twelfth grades in school increases gradually with increasing grade.

It may also be concluded that the discrepancy in points between the NORC levels of responses to identical questions on the OAS made by students in the fifth through the twelfth grades is inversely related to the level of the students' fathers' occupations on O. D. Duncan's socio-economic index, to the students' scores on IPAT, Test of G: Culture Free, and to the students' GPA percentile rankings. This is to say that the degree of crystallization in the levels of occupational aspiration of students in the fifth through the twelfth grades in school is directly related to their SES, I.Q., and GPA.

Furthermore, it may be concluded that boys and girls react to the Occupational Aspiration Scale in different ways. Girls tend to show greater crystallization than boys in their realistic short-range and idealistic long-range LOA, and contrariwise, boys tend to show greater crystallization than girls in their idealistic short-range and realistic long-range LOA.

Summary of the Chapter

The foregoing chapter has been devoted to a presentation of the results of research aimed at testing the operational hypotheses stated in Chapter II. These results have included the demonstration of the existence of the hypothesized crystallization process and the linking of this process, in terms of intensity, to certain relevant variables, namely socio-economic status, intelligence, and academic performance. They also have exposed sex differences in crystallization.

The following chapter will summarize the research and list the conclusions to be made from it. Lastly, it will include some discussion of problems for future research.

CHAPTER IV

SUMMARY AND CONCLUSIONS

Introduction

The previous three chapters have: 1) introduced the problem under study, 2) described a plan for investigating the problem, and 3) presented the results of the execution of that plan. The purpose of the present chapter is to summarize the foregoing research, to list the conclusions reached, and finally, to describe some aspects of the research area which need further investigation.

Summary of the Research

The effort of the research described in the previous chapters has been to throw light upon the nature of occupational aspirations and the process of their development in young people. The question to be answered was: Do the levels of occupational aspiration of young people become more stable and consistent during their elementary and secondary school years? Certainly we should expect this because they doubtless become more aware of the occupational hierarchy in the society and their own differential abilities to meet the entrance requirements of the various levels within it. This varying degree of consistency in the level of occupational aspiration was called crystallization and it was anticipated that there would be a trend to increased crystallization of LOA in young people as they approached adulthood. Furthermore, it was anticipated that the degree of crystallization would be affected by certain other factors; namely, socio-economic status, intelligence, and relative excellence in academic performance.

Hypotheses were proposed and a research design was constructed to allow for an expeditious, operational testing of the hypotheses.

Subsequently, the results of the investigation were presented and evaluated with respect to the operationalizations of the original hypotheses. Ultimately, the problem is to evaluate the research as it bears on the original theoretical formulations. It is to this that Chapter IV is devoted.

Conclusions

To the extent that the cross-sectional technique utilized in this experiment is a valid substitute for longitudinal data on changes in crystallization with age, and to the extent that the behavior of this sample is representative of the behavior of other samples of American boys and girls, it is expected that the conclusions drawn from it are valid additions to empirical knowledge.

With these reservations in mind, the conclusions to be made from the foregoing experiment are as follows.

The principal hypothetical statement proposed the existence of a process of crystallization in the levels of occupational aspiration of young people. The rationale for this proposition was that young people, as a result of learning and experience during their elementary and secondary school years, become more aware of the nature of the job structure and of their ability to fit into it at some particular level--a development which should be reflected in a "precising" of their LOA.

By cross-sectional analysis of the fifth through the twelfth grades in a public school system utilizing the best instrument available for the measurement of LOA, it has been possible to demonstrate the existence of a definite trend to increased crystallization in such students' levels of occupational aspiration. Hence, there is support for Hypothesis I as proposed in Chapter I.

Inasmuch as crystallization does take place in the serious thoughts which young people have about their job futures, it should be associated in predictable ways with other important facts about them. It is reasonable to assume, for instance, that an individual of high intelligence will have greater crystallization of LOA, for he possesses the superior perception and intellection essential for the rapid negotiation of this essential process. Similarly, those who have higher socio-economic status and who perform better in school work should be exposed earlier to the requirements of the job structure and should have a better understanding of their abilities in relation to it. Hence, they, too, should show greater crystallization in LOA. (It is recognized that the inference of any one of these "independent" variables might account for part of the apparent influence of the others, because they all are positively correlated.)

On the basis of the evidence the above notions are correct. The data support Hypotheses II, III, and IV as stated in Chapter I: the progress of crystallization definitely varies by differential socio-economic status, intelligence, and academic performance. Persons who rank high in these indexes are more likely at any stage to show greater crystallization in their levels of occupational aspiration than are persons who rank low.

The fact that girls, as well as boys, were included in this study of crystallization makes it possible to provide some initial information on boy-girl differences. The most consistent sex difference exposed in this research is in the relative crystallization of the four OAS components of LOA. Girls seem to be able to designate their immediate realistic goals and their long-range idealistic goals with greater precision than boys. In contrast, boys seem to be able to identify their immediate idealistic goals and their long-range realistic goals more precisely than girls.

Crystallization for boys does not vary greatly from component to component as does that for girls. The overall crystallization for boys in this experiment is slightly less than that for girls.

Problems for Future Research

In the conceptual development of the hypotheses in this thesis, it has been assumed that the increase in crystallization of LOA in young people is a function of these people's increasing awareness of: 1) the occupational hierarchy, 2) the differential entrance requirements of various levels within it, and 3) their own differential abilities to meet such requirements.

There is little doubt that the above conditions are critical in determining crystallization of LOA and they have correctly predicted trends in crystallization for the time period studied. However, the precision of the individual's perception of the status hierarchy may vary from that of his perception of differential entrance requirements and the precision of this may vary from that of his own relative ability. This is clearly an aspect of the development of occupational aspirations which needs investigation.

It is clear also that much more information is needed on the occupational aspirations of girls. What is the explanation for the apparent differences between the LOA crystallization of girls and boys?

These problems are only some of the more obvious ones and the ones presently most accessible to study. As these and other problems are investigated, our comprehension of the nature of occupational aspirations will be more complete.

BIBLIOGRAPHY

Campbell, D. T. "Factors Relevant to the Validity of Experiments in Social Settings," Psychological Bulletin, Vol. 54, July 1957.

Cattell, R. B. and Cattell, A. K. S. IPAT, Test of G: Culture Free, Scales 2a and 3a.

Duncan, O. D. "A Socio-economic Index for all Occupations." (Two chapters of a forthcoming book by Albert Reiss.)

Hagood, M. J. Statistics for Sociologists. New York: Holt, 1941.

Haller, A. O. Occupational Aspiration Scale. Copyright 1957 by A. O. Haller, Michigan State University, East Lansing, Michigan.

Haller, A. O. and Butterworth, C. E. "Peer Influences on Levels of Occupational and Educational Aspiration," Social Forces, Vol. 38, May 1960.

Haller, A. O. and Miller, I. W. The Occupational Aspiration Scale: Theory, Structure, and Correlates of an Instrument Designed to Measure Differential Levels of Occupational Aspiration. Michigan State University, East Lansing, Michigan, 1961. (Mimeo.)

IPAT, Handbook for the Individual or Group, Culture Free Intelligence Test, 1959.

National Opinion Research Center. "Jobs and Occupation: A Popular Evaluation," Opinion News, Vol. 9, 1947.

Sewell, W. E. et al. "Social Status and Educational and Occupational Aspirations," American Sociological Review, Vol. 22, February 1957.

U. S. Census of Population 1960, Final Report PC(1)-24A.

APPENDICES

APPENDIX I

Total Score_____

OCCUPATIONAL ASPIRATION SCALE

Revision 1

Your Name _____

Today's Date _____
Month Day Year

Your Age _____

Instructions
(To be read aloud by the administrator).

1. Be sure to write your name, today's date, and your age in the spaces above.
2. This set of eight questions concerns jobs.
3. Read EACH QUESTION carefully. They are not always the same.
4. YOU ARE TO CHECK ONE JOB IN EACH QUESTION. MAKE SURE IT IS THE BEST ANSWER YOU CAN GIVE TO THE QUESTION.
5. Answer every question. Don't omit any.
6. If you don't know what one of the jobs is, just ignore it.
7. On the next page there are two practice questions. Let's try them.

(Turn to page 2).

To the teacher: Practice questions A and B are to be read aloud.

Practice Question A. Of the jobs listed in this questions, which is the BEST ONE you are REALLY SURE YOU CAN GET when your SCHOOLING IS OVER?

A.1 _____Watchmaker

A.2 _____Senator

A.3 _____Public relations man

A.4 _____Ditch digger

A.5 _____New-stand operator

A.6 _____Beautician

A.7 _____Fireman

A.8 _____Boxer

A.9 _____Secretary

A.10_____Movie star

Practice Question B. Of the jobs listed in this question, which ONE would you choose to have when you are 30 YEARS OLD, if you were FREE TO HAVE ANY of them you wished?

B.1 _____File clerk

B.2 _____Steeple jack

B.3 _____Floor walker in a store

B.4 _____Ambassador to a foreign country

B.5 _____Grocery clerk

B.6 _____Wrestler

B.7 _____Nurse

B.8 _____T.V. sports announcer

B.9 _____Forest ranger

B.10 _____Music teacher

Question 1. Of the jobs listed in this question, which is the BEST ONE you are REALLY SURE YOU CAN GET when your SCHOOLING IS OVER?

1.1_____Welfare worker for a city government

1.2_____United States representative in Congress

1.3_____United States Supreme Court Justice

1.4_____Sociologist

1.5_____Filling station attendent

1.6_____Night watchman

1.7_____Policeman

1.8_____Corporal in the Army

1.9_____County agricultural agent

1.10_____Lawyer

Question 2. Of the jobs listed in this question, which ONE would you choose if you were FREE TO CHOOSE ANY of them you wished when your SCHOOLING IS OVER?

2.1_____Singer in a night club

2.2_____Member of the board of directors of a large corporation

2.3_____Railroad conductor

2.4_____Railroad engineer

2.5_____Undertaker

2.6_____Physician (doctor)

2.7_____Clothes presser in a laundry

2.8_____Banker

2.9_____Accountant for a large business

2.10_____Machine operator in a factory

Question 3. Of the jobs listed in this question which is the BEST ONE you are REALLY SURE YOU CAN GET when your SCHOOLING IS OVER?

3.1_____Dock worker

3.2_____Owner-operator of a lunch stand

3.3_____Public school teacher

3.4_____Trained machinist

3.5_____Scientist

3.6_____Lumberjack

3.7_____Playground director

3.8_____Shoeshiner

3.9_____Owner of a factory that employs about 100 people

3.10_____Dentist

Question 4. Of the jobs listed in this question, which ONE would you choose if you were FREE TO CHOOSE ANY of them you wished when your SCHOOLING IS OVER?

4.1_____Restaurant waiter

4.2_____Electrician

4.3_____Truck driver

4.4_____Chemist

4.5_____Street sweeper

4.6_____College professor

4.7_____Local official of a labor union

4.8_____Building contractor

4.9_____Traveling salesman for a wholesale concern

4.10_____Artist who paints pictures that are exhibited in galleries

Question 5. Of the jobs listed in this question, which is the BEST ONE you are REALLY SURE YOU CAN HAVE by the time you are 30 YEARS OLD?

5.1_____Farm hand

5.2_____Mail carrier

5.3_____County judge

5.4_____Biologist

5.5_____Barber

5.6_____Official of an international labor union

5.7_____Soda fountain clerk

5.8_____Reporter for a daily newspaper

5.9_____State governor

5.10_____Nuclear physicist

Question 6. Of the jobs listed in this question, which ONE would you choose to have when you are 30 YEARS OLD, if you were FREE TO HAVE ANY of them you wished?

6.1_____Janitor

6.2_____Head of a department in state government

6.3_____Cabinet member in the federal government

6.4_____Musician in a symphony orchestra

6.5_____Carpenter

6.6_____Clerk in a store

6.7_____Coal miner

6.8_____Psychologist

6.9_____Manager of a small store in a city

6.10_____Radio announcer

Question 7. Of the jobs listed in this question, which is the BEST ONE you are REALLY SURE YOU CAN HAVE by the time you are 30 YEARS OLD?

7.1_____Mayor of a large city

7.2_____Milk route man

7.3_____Captain in the army

7.4_____Garbage collector

7.5_____Garage mechanic

7.6_____Insurance agent

7.7_____Architect

7.8_____Owner-operator of a printing shop

7.9_____Airline pilot

7.10_____Railroad section hand

Question 8. Of the jobs listed in this question, which ONE would you choose to have when you are 30 YEARS OLD, if you were FREE TO HAVE ANY of them you wished?

8.1_____Civil engineer

8.2_____Author of novels

8.3_____Diplomat in the United States Foreign Service

8.4_____Taxi driver

8.5_____Newspaper columnist

8.6_____Share cropper (one who owns no livestock of farm machinery, and does not manage the farm)

8.7_____Plumber

8.8_____Bookkeeper

8.9_____Streetcar motorman or city bus driver

8.10_____Minister or Priest

IPAT

Test of g: Culture Fair

Scale 2, Form A

Prepared by R. B. Cattell and A. K. S. Cattell

Name_____ Sex_____
First Last (Write M or F)

Name of School (or Address)_____

Today's Date_____ Grade (or Class)_____

Date of Birth_____ Age_____
Month Day Year Years Months

Test	Score	Remarks
1		
2		
3		
4		
		Total Score

M.A._____

C.A._____

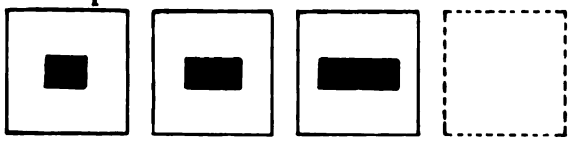
I.Q._____

DO NOT TURN PAGE UNTIL TOLD TO DO SO.

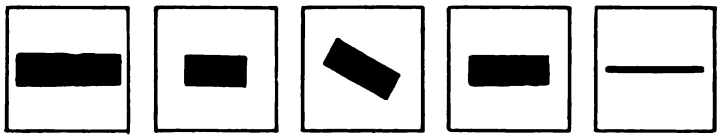
First printing, 1949; second printing, 1950; third printing, 1954; fourth printing, 1957; fifth printing, 1960

TEST 1

Examples

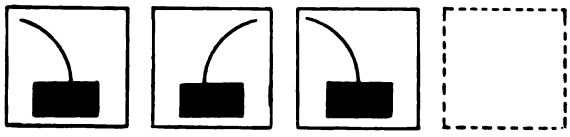


1 2 3 4 5

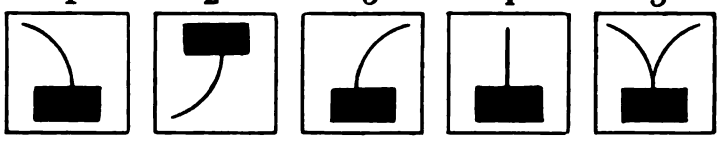


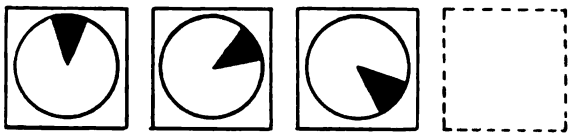
Answers

1

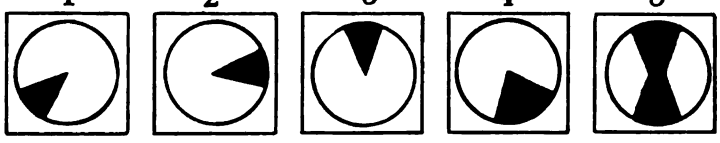


1 2 3 4 5

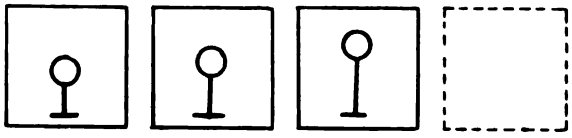




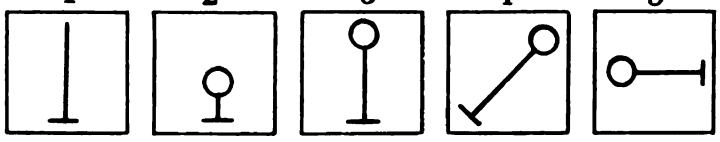
1 2 3 4 5



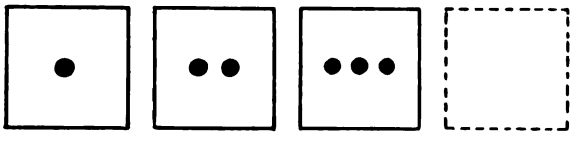
1.



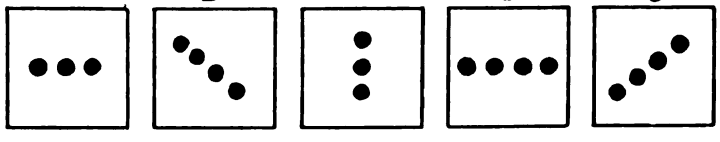
1 2 3 4 5



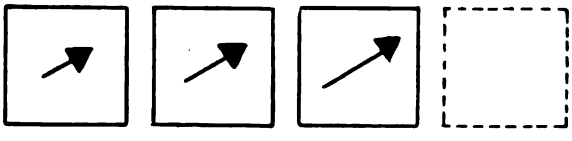
2.



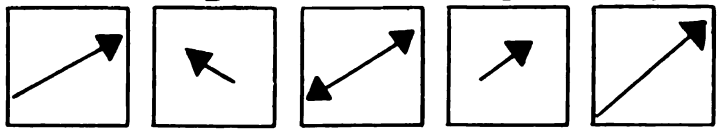
1 2 3 4 5



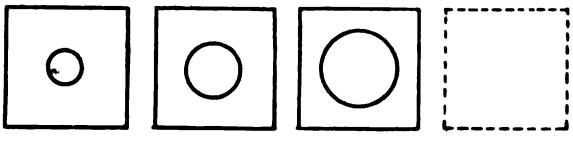
3.



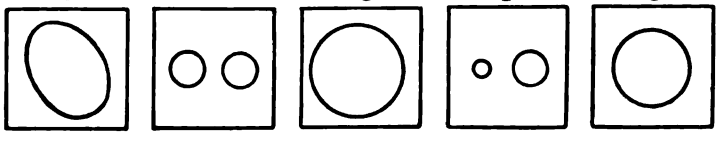
1 2 3 4 5



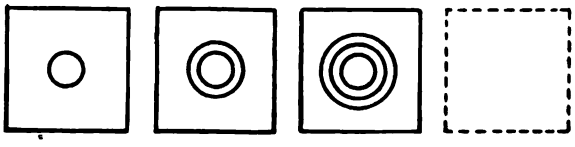
4.



1 2 3 4 5



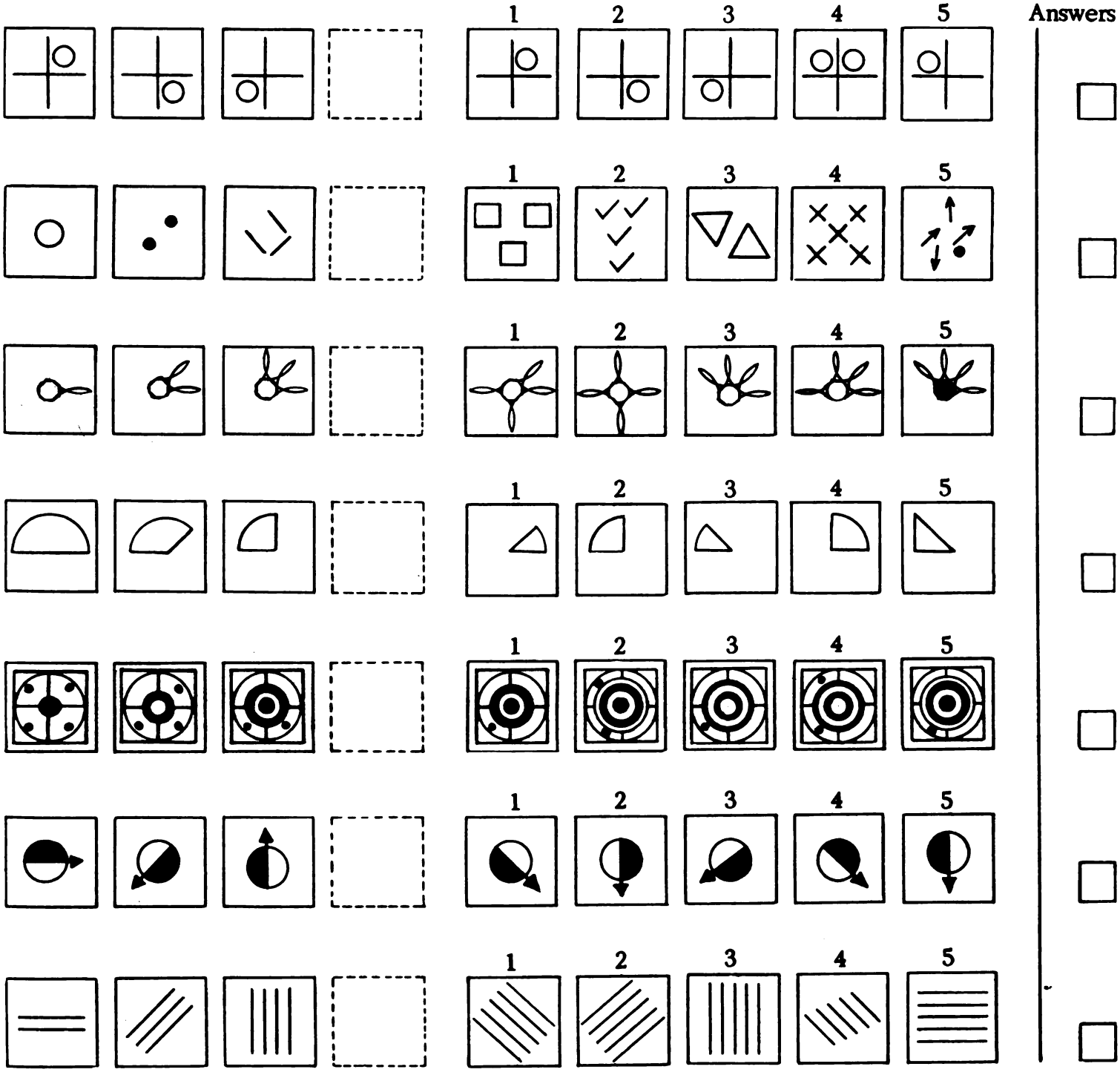
5.



1 2 3 4 5

Go right on to next page.

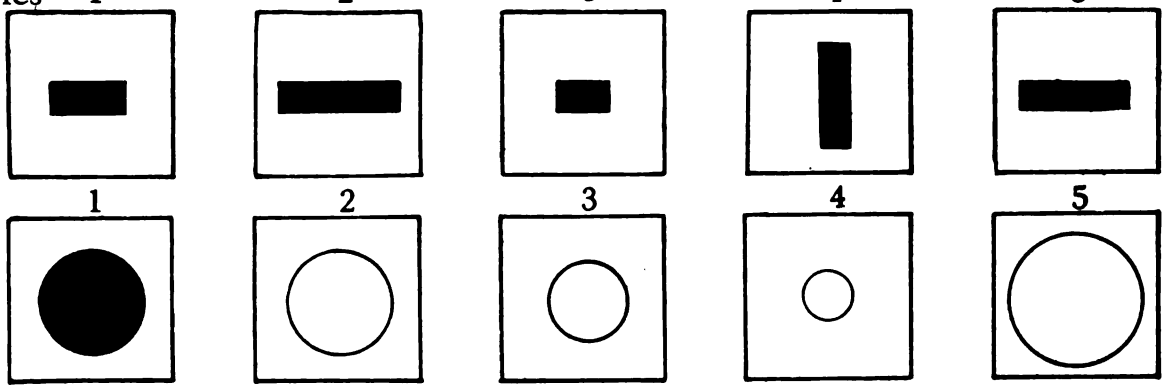
1.



Do not turn page until told to do so.

TEST 2

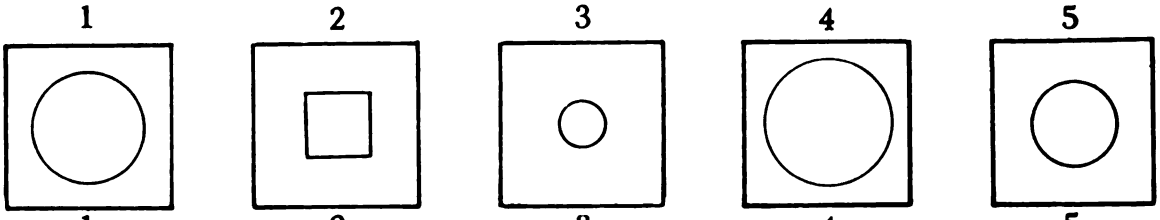
Examples



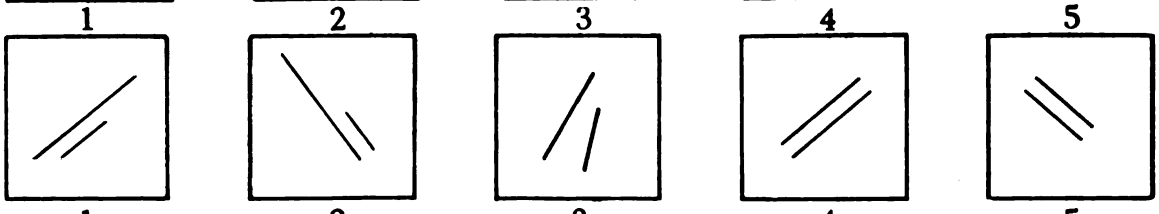
Answers

4

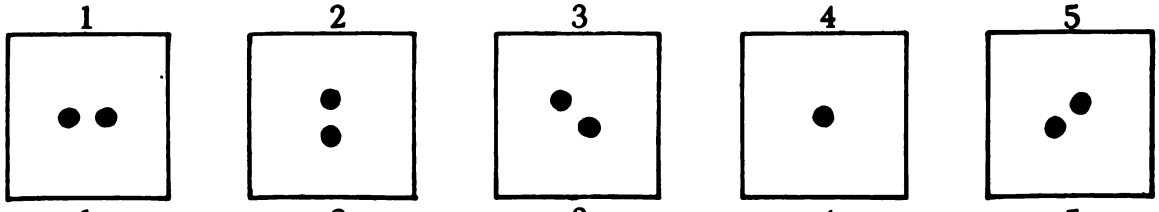
1.



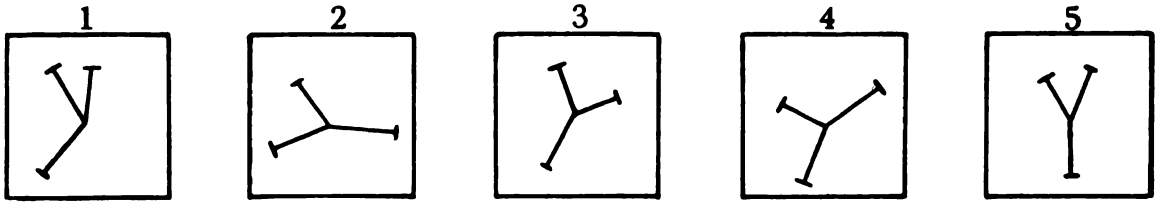
2.



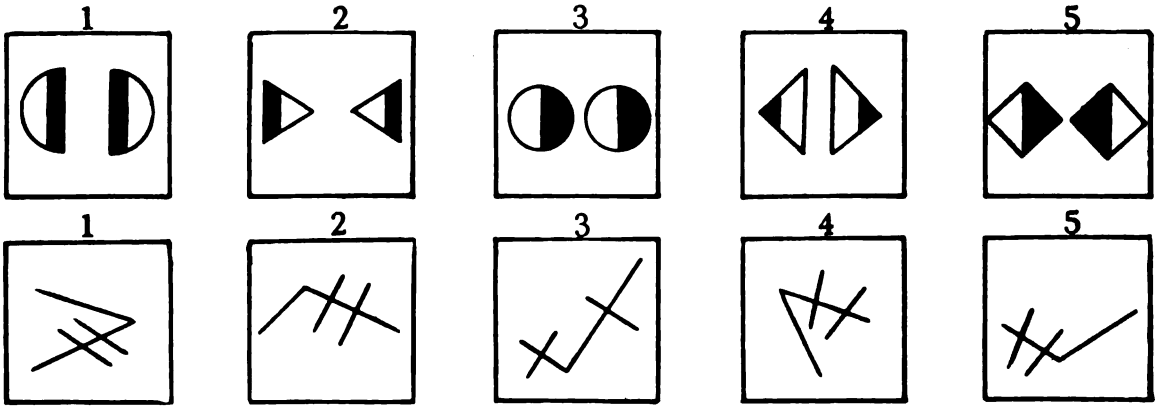
3.



4.

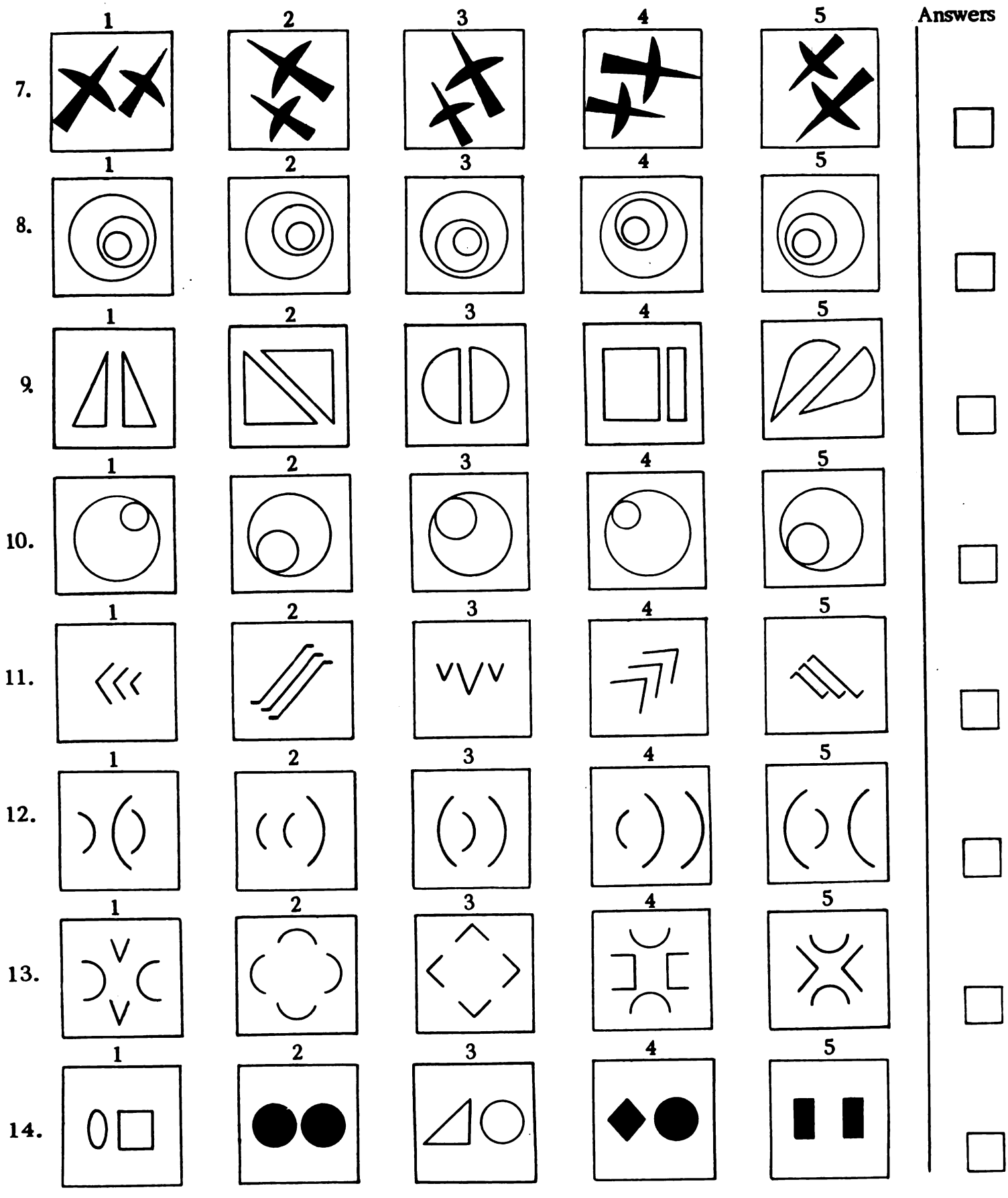


5.



6.

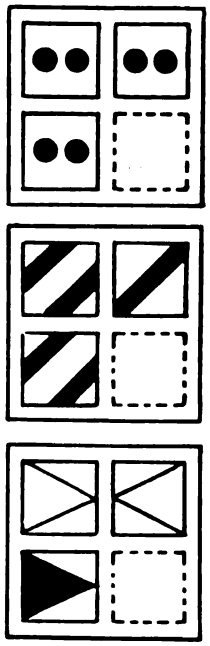
Go right on to next page.



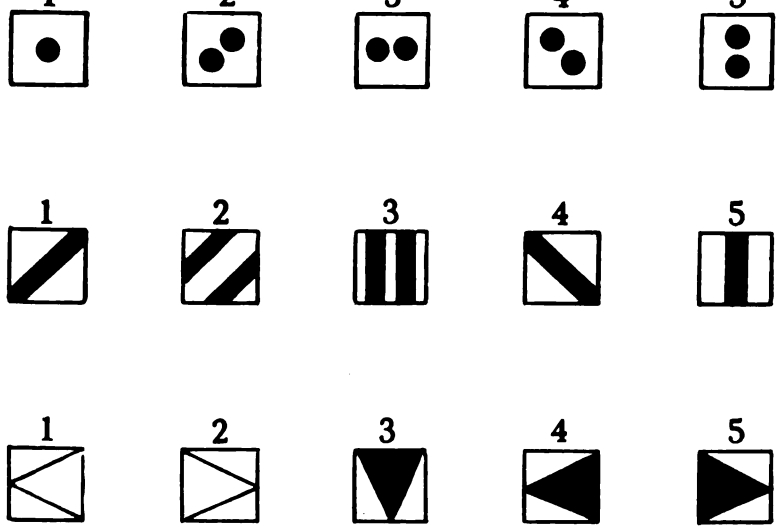
Do not turn page until told to do so.

TEST 3

Examples



1 2 3 4 5

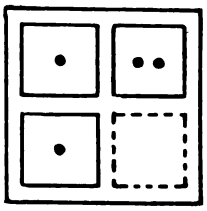


Answers

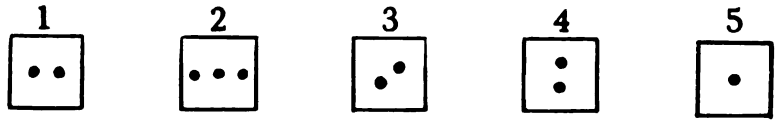
3

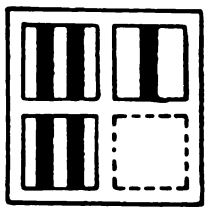
1 2 3 4 5

1 2 3 4 5

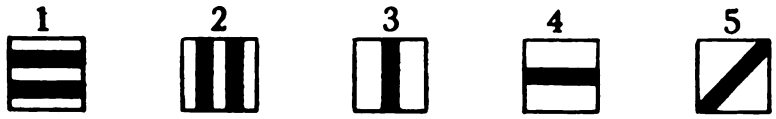
1. 

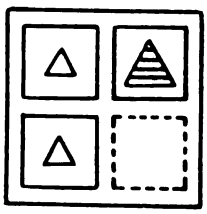
1 2 3 4 5



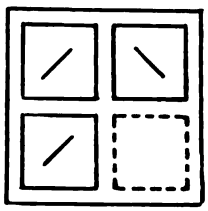
2. 

1 2 3 4 5

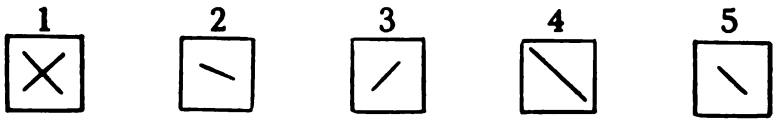


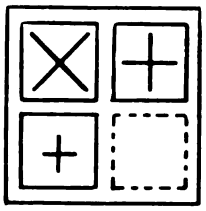
3. 

1 2 3 4 5

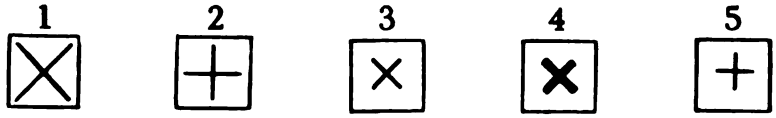
4. 

1 2 3 4 5

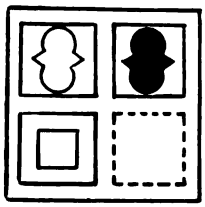


5. 

1 2 3 4 5



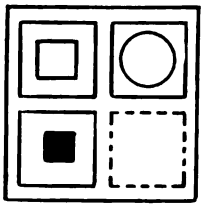
Go right on to next page.



6.

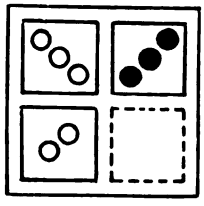
1 2 3 4 5

Answers



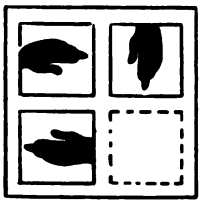
7.

1 2 3 4 5



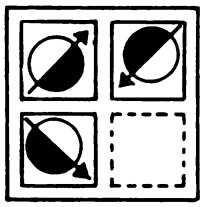
8.

1 2 3 4 5



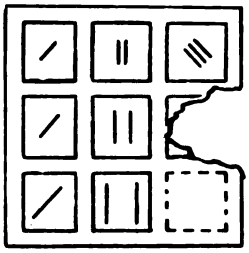
9.

1 2 3 4 5



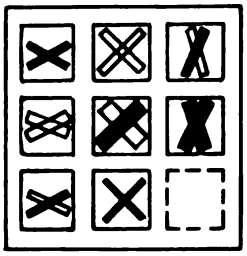
10.

1 2 3 4 5



11.

1 2 3 4 5



12.

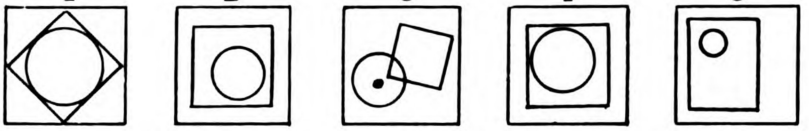
1 2 3 4 5

Do not turn page until told to do so.

TEST 4

Examples

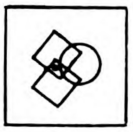
1 2 3 4 5



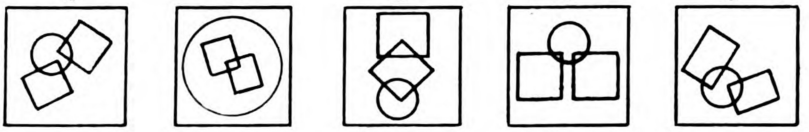
Answers

3

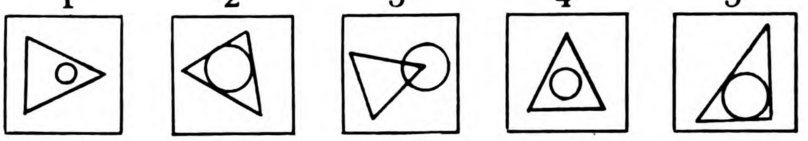
1 2 3 4 5



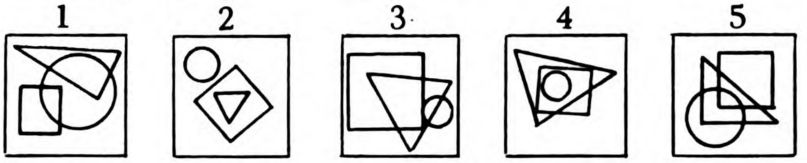
1 2 3 4 5



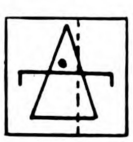
1. 1 2 3 4 5

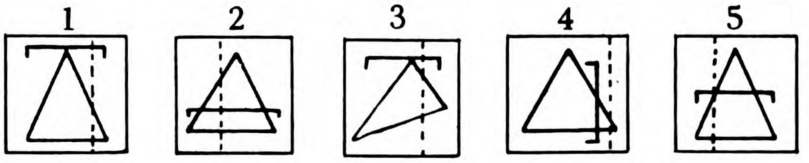


2. 1 2 3 4 5

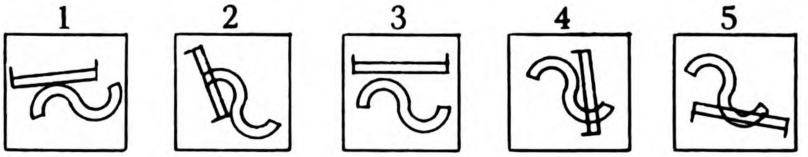


3. 1 2 3 4 5

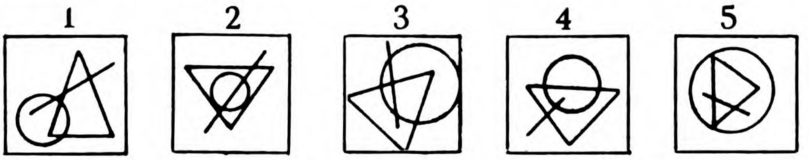




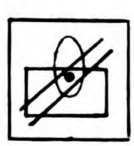
4. 1 2 3 4 5

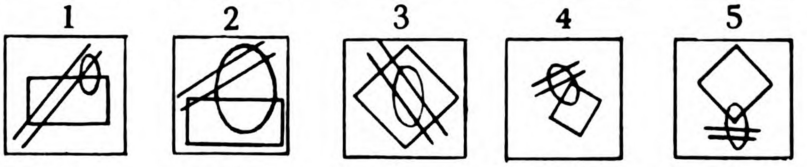


5. 1 2 3 4 5

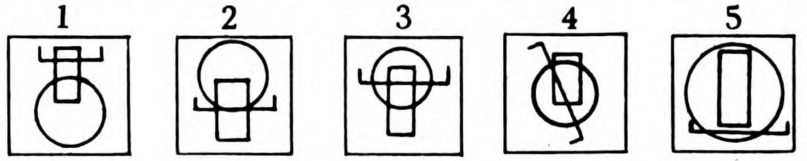


6. 1 2 3 4 5

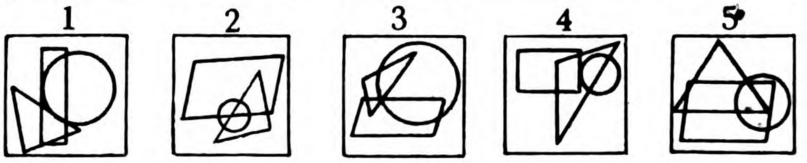




7. 1 2 3 4 5



8. 1 2 3 4 5



IPAT

Test of g: Culture Free

Scale 3A

Prepared by R. B. Cattell and A. K. S. Cattell

Name _____ Sex _____
First Last (Write M or F)

Name of School (or Address) _____

Today's Date _____ Class (or Form) _____

Date of Birth _____ Age _____
Month Day Year Years Months

Test	Score	Remarks
1		
2		
3		
4		
		Total Score

M.A. _____

C.A. _____

I. Q. _____

DO NOT TURN PAGE UNTIL TOLD TO DO SO.

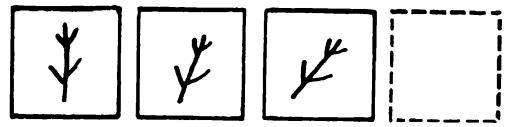
Institute for Personality and Ability Testing, 1602 Coronado Drive, Champaign, Illinois.

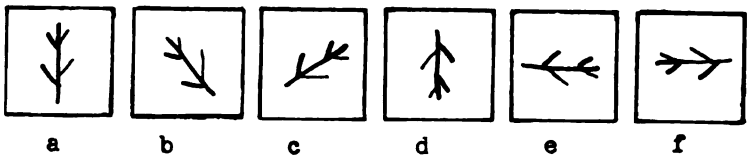
First printing, 1950; second printing, 1951; third printing, 1955.

TEST 1

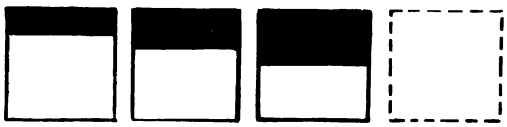
EXAMPLES

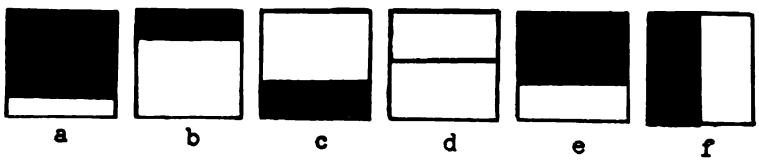
2.
ANSWERS



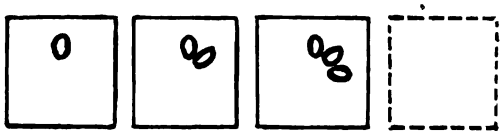


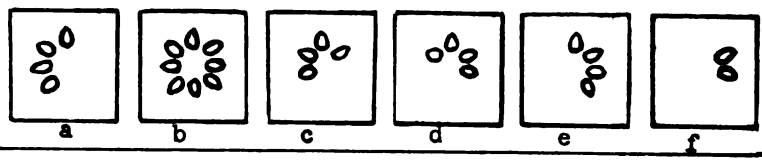
c





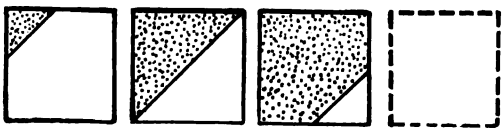
e

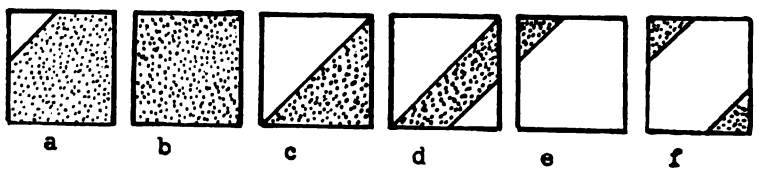




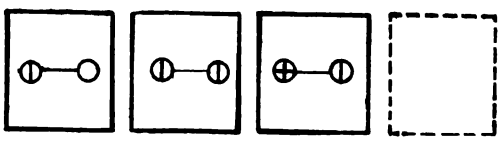
e

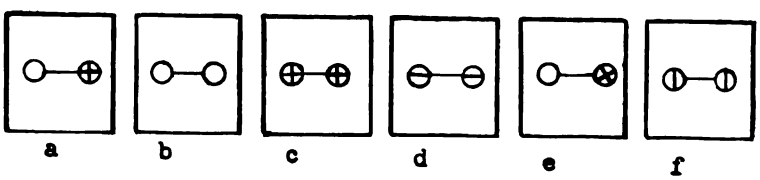
1.



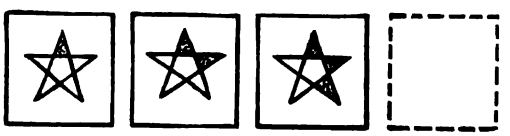


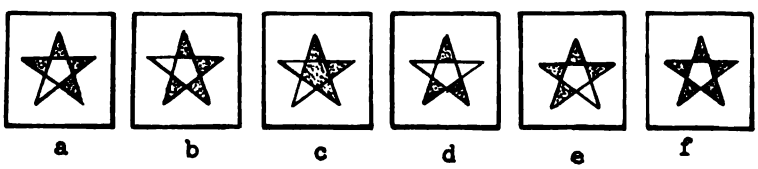
2.





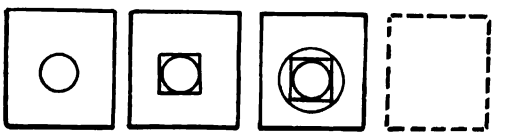
3.

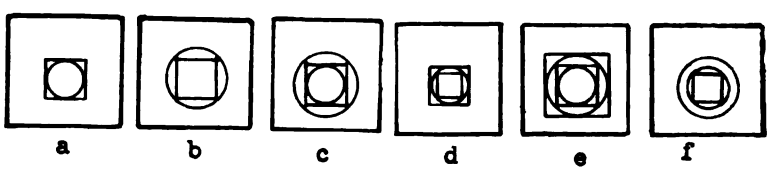




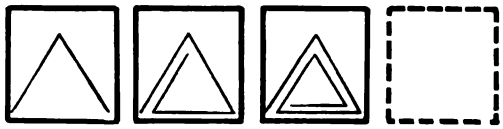
4.

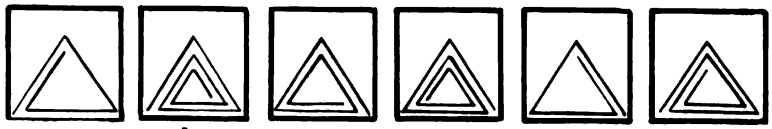
5.

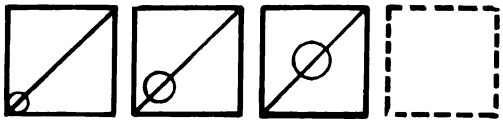


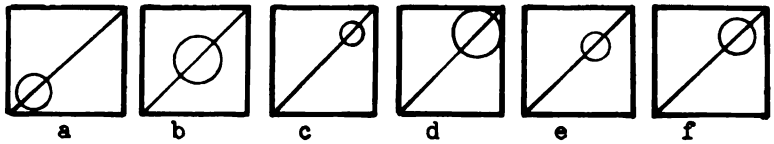


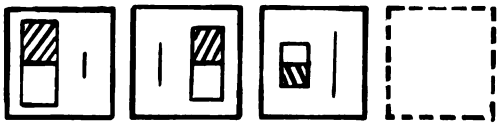
3.

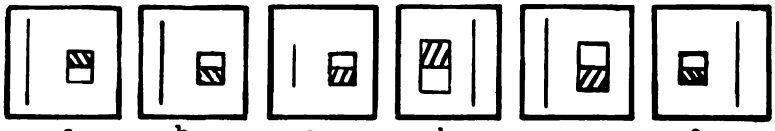
6. 

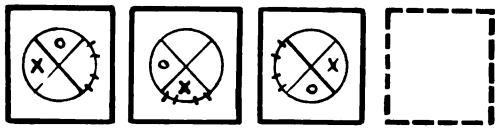


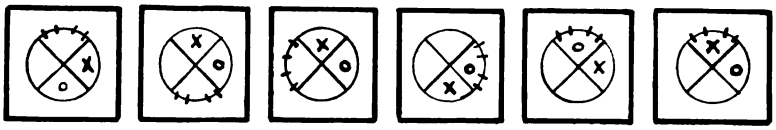
7. 

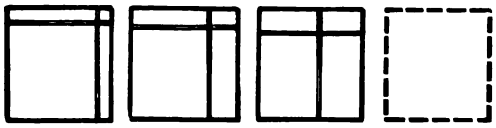


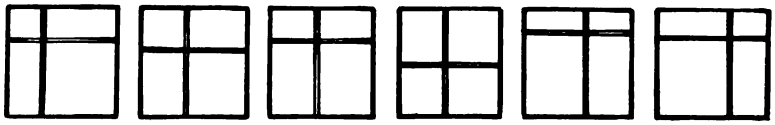
8. 

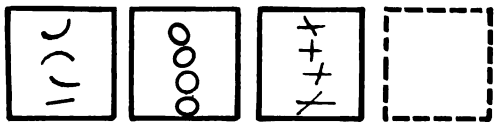


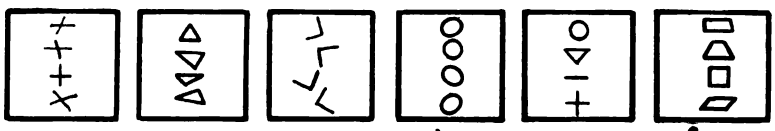
9. 

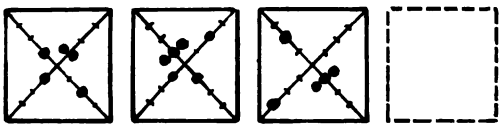


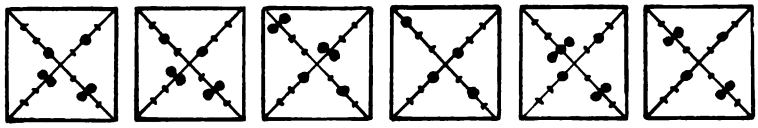
10. 

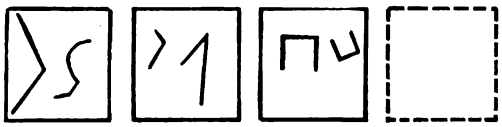


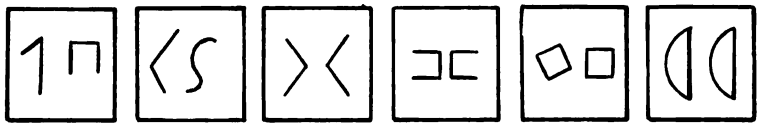
11. 



12. 



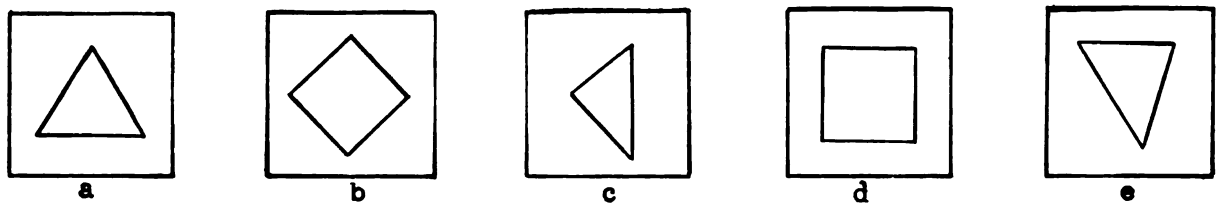
13. 

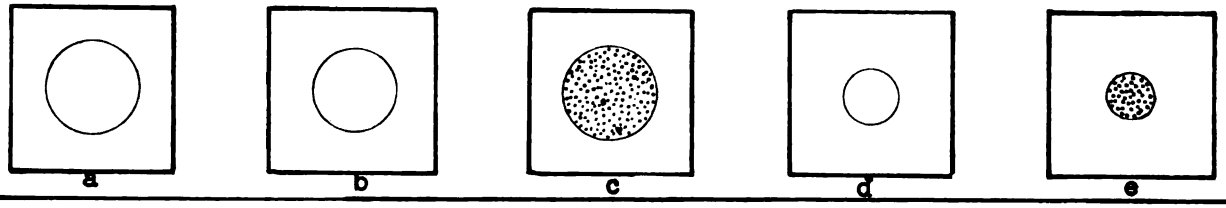


DO NOT TURN THIS PAGE UNTIL TOLD TO DO SO

TEST 2

EXAMPLES



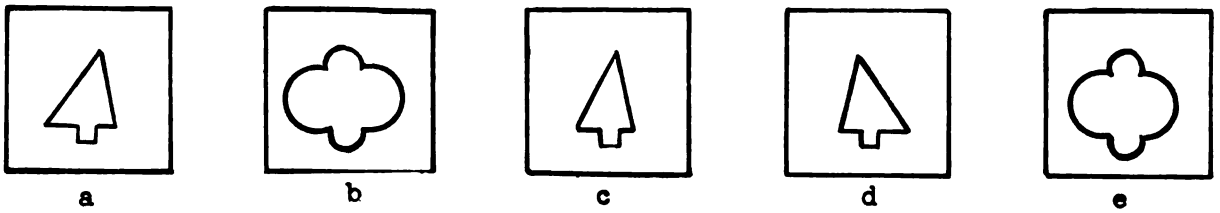


4. ANSWERS

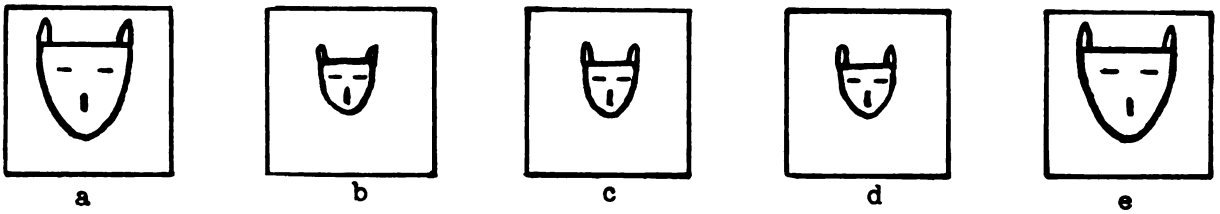
b d

c e

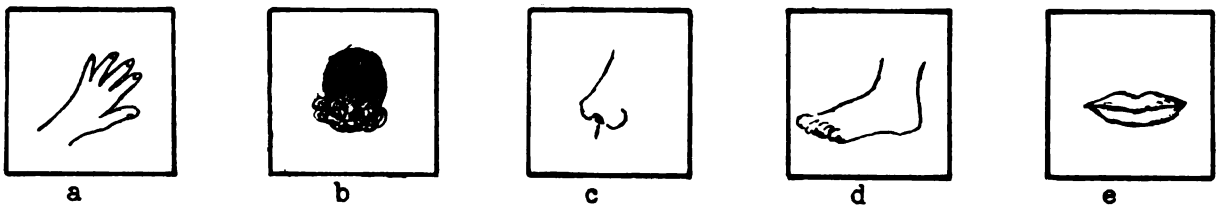
1.



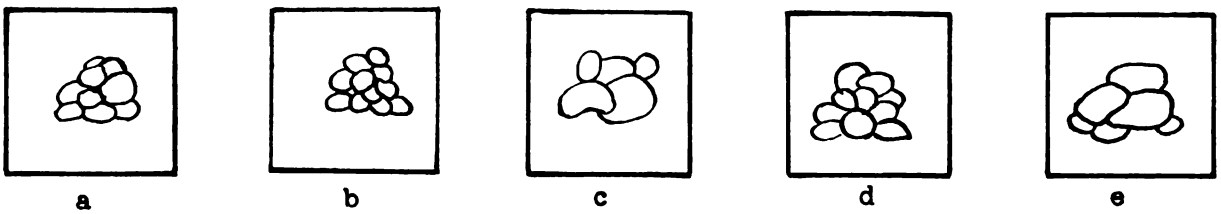
2.



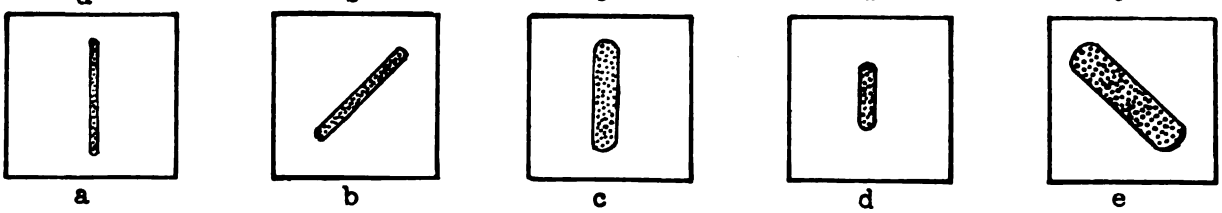
3.



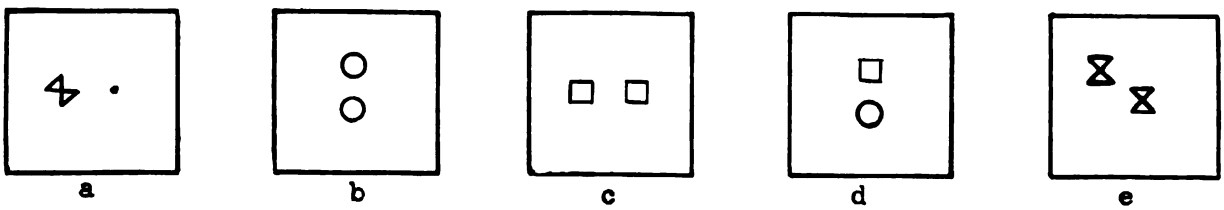
4.



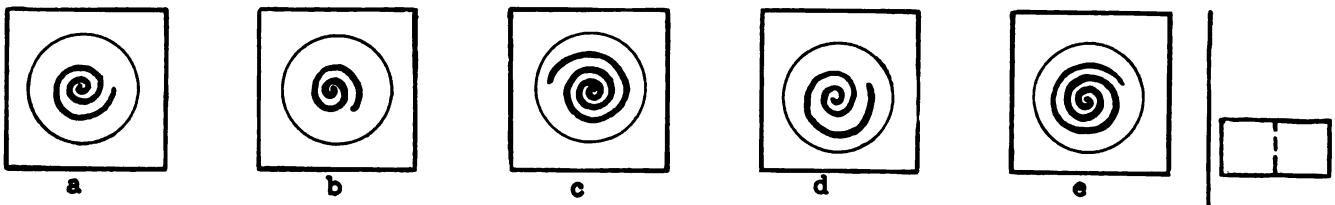
5.



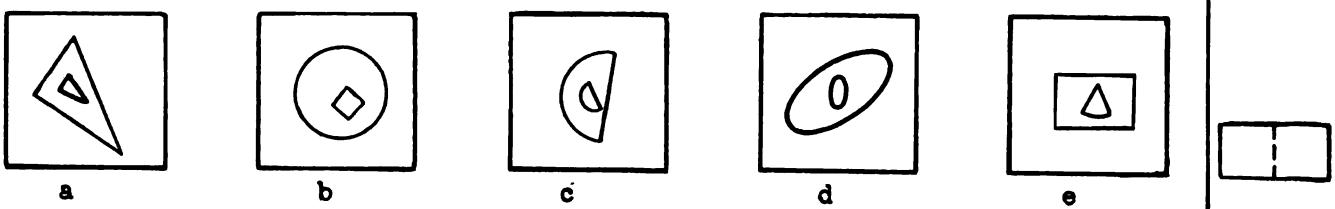
6.



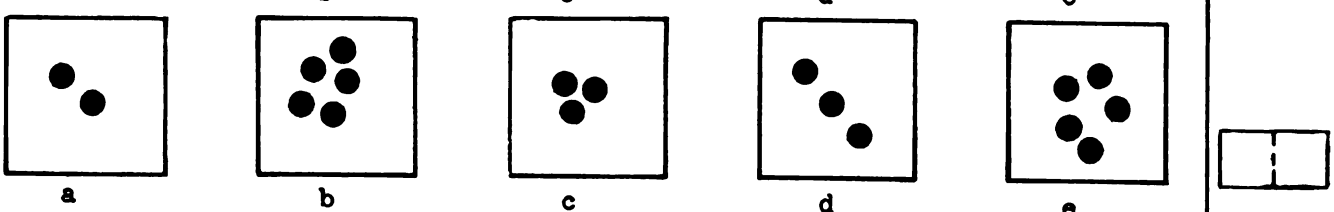
7.



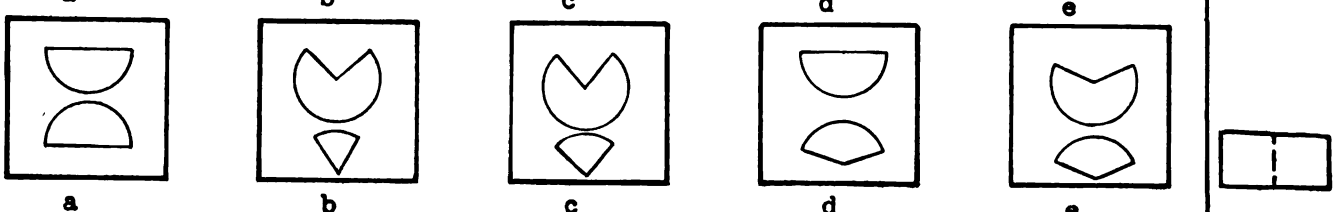
8.



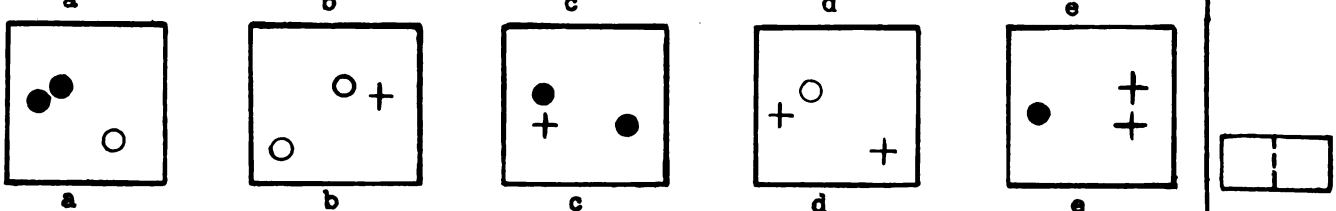
9.



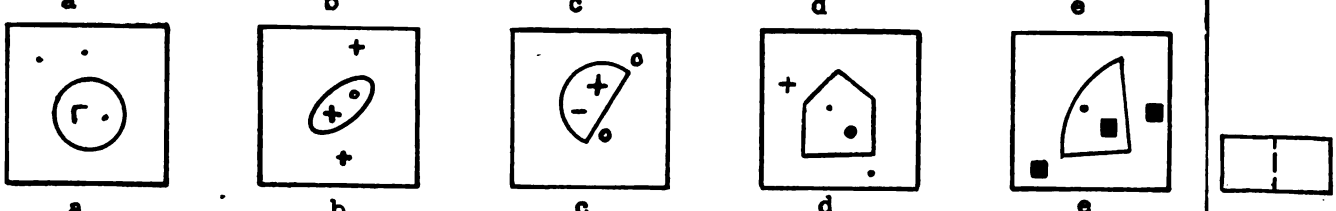
10.



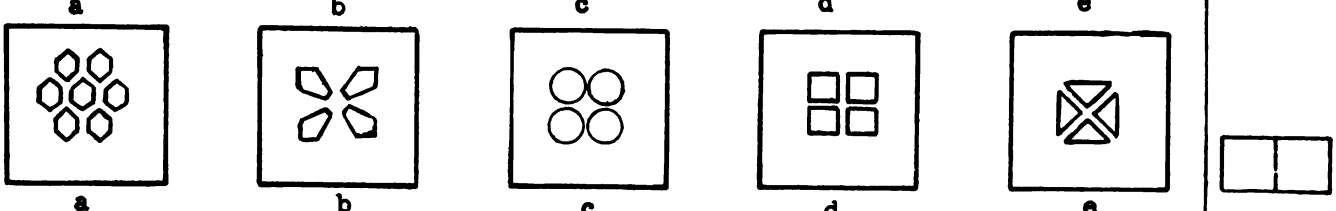
11.



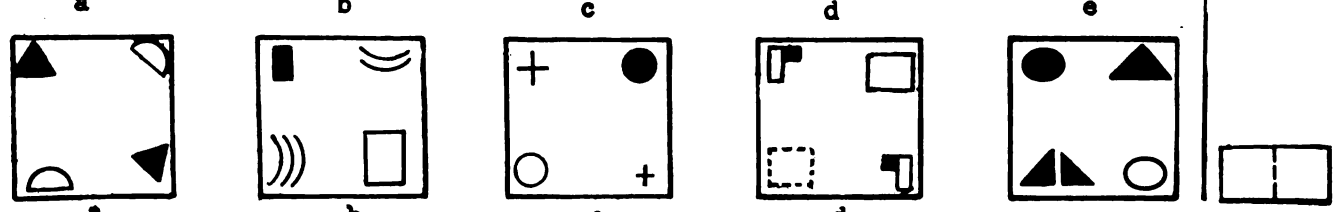
12.



13.



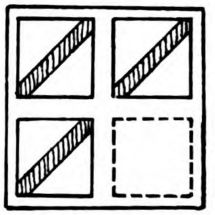
14.

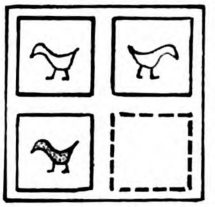


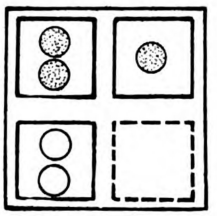
DO NOT TURN THIS PAGE UNTIL TOLD TO DO SO

TEST 3

EXAMPLES







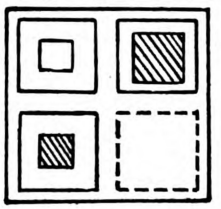
6.
ANSWERS

b

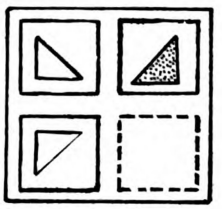
c

f

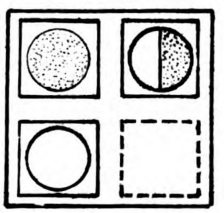
1.



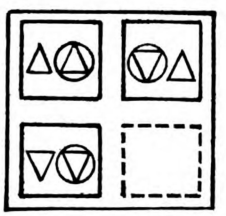
2.



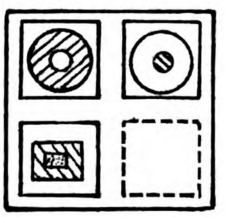
3.



4.



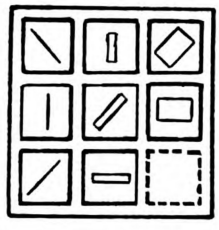
5.



7.

6. 

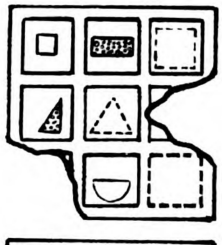
a b c d e f

7. 

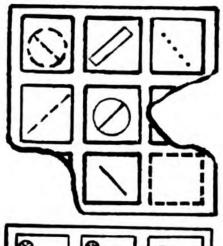
a b c d e f

8. 

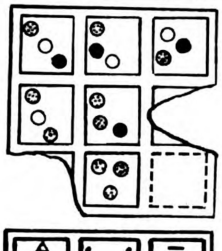
a b c d e f

9. 

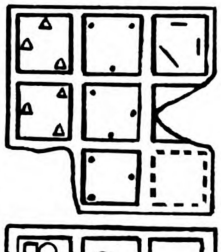
a b c d e f

10. 

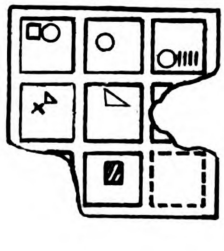
a b c d e f

11. 

a b c d e f

12. 

a b c d e f

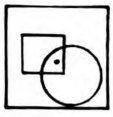
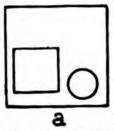
13. 

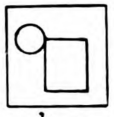
a b c d e f

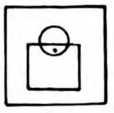
DO NOT TURN THIS PAGE UNTIL TOLD TO DO SO

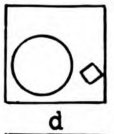
TEST 4

EXAMPLES

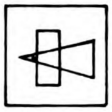
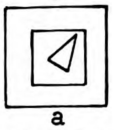


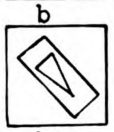


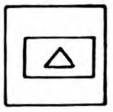


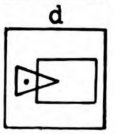
ANSWERS

c

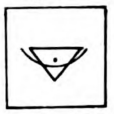



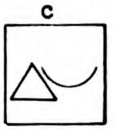


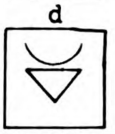




d

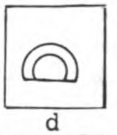





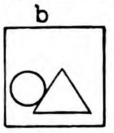


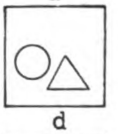
b

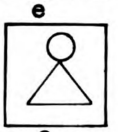
1. 

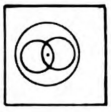
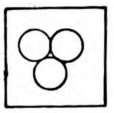



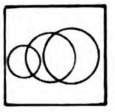
2. 

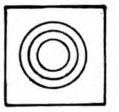



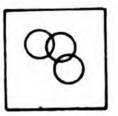


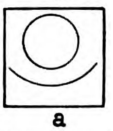


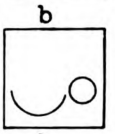
3. 


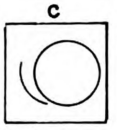


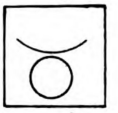


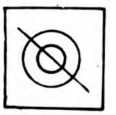


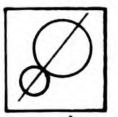
4. 


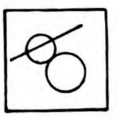




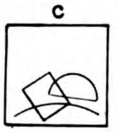


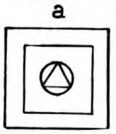
5. 


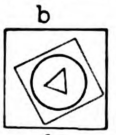


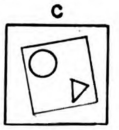


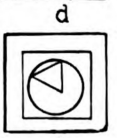
6. 

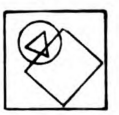



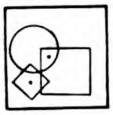
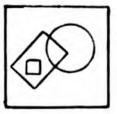
7. 


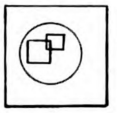


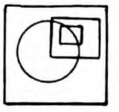


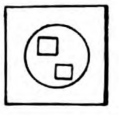


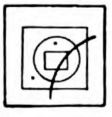


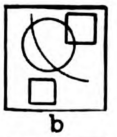
8. 


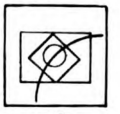




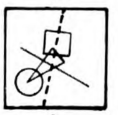


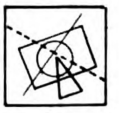
9. 

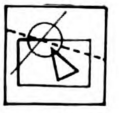



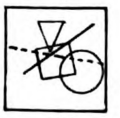


10. 







STUDENT INFORMATION AND OCCUPATIONAL PLANS

QUESTIONNAIRE

1. MY NAME IS:_____. TODAY'S DATE:_____

2. MY AGE (to nearest birthday) IS:_____.

   THE DATE OF MY BIRTH WAS:_____.
   Month Day Year

3. MY SEX IS: ( ) Male. ( ) Female.

4. MY GRADE IN SCHOOL IS:_____.

5. THE NAME OF MY SCHOOL IS:_____.

6. MY HOME ADDRESS IS:_____.

7. MY FATHER'S OCCUPATION IS: (or was, if he is dead or retired)
   (Tell what KIND of work he does, NOT where he works.)

   _____

   _____

8. ABOUT MY PLANS FOR EDUCATION AFTER I LEAVE HIGH SCHOOL:

   ( ) I plan to get more education after high school.
   ( ) I do not plan to get more education after high school.
   ( ) I don't know.

9. THE OCCUPATION I PLAN TO FOLLOW IS:_____

   _____

10. IF I WERE COMPLETELY FREE TO GO INTO ANY KIND OF WORK I WANTED, MY CHOICE WOULD BE:

    _____

    _____

STUDENT ACADEMIC RECORD

INFORMATION FORM

NAME:_____ GRADE:_____

SEX: ( ) Male. ( ) Female. SCHOOL:_____

HOME ADDRESS:_____

FATHER'S OCCUPATION:_____

MOTHER'S OCCUPATION:_____

PARENTS' EDUCATION:_____

4th Grade	5th Grade	6th Grade	7th Grade
___ Math	___ Math	___ Math	___ Math
___ Eng	___ Eng	___ Eng	___ Eng
___ Sci	___ Sci	___ Sci	___ Sci
___ S.S.	___ S.S.	___ S.S.	___ S.S.
___ Av.	___ Av.	___ Av.	___ Av.

8th Grade	9th Grade	10th Grade	11th Grade
___ Math	___ Math	___ Math	___ Math
___ Eng	___ Eng	___ Eng	___ Eng
___ Sci	___ Sci	___ Sci	___ Sci
___ S.S.	___ S.S.	___ S.S.	___ S.S.
___ Av.	___ Av.	___ Av.	___ Av.

12th Grade

___ Math
___ Eng
___ Sci
___ S.S.

___ Av.

TOTAL AVERAGE:_____

AVERAGE LAST TWO YEARS:_____

SCHOOL ENROLLMENT HISTORY:_____

_____

_____

APPENDIX II

20 April 1961

CRYSTALLIZATION TRENDS IN THE LEVELS OF OCCUPATIONAL ASPIRATION OF ELEMENTARY AND SECONDARY SCHOOL STUDENTS

Jon Hill Rieger

IBM PUNCH CARD CODING KEY

Column Number	Information
1, 2, 3	Person Identification; three digit field (3 df) 001 : 999 (N=380)
4	Sex Identification; 1 Male 2 Female
5	School Identification; 1 Turner 2 Westwood Hills 3 Union High School (from Turner) 4 Union High School (from Westwood Hills) 5 Union High School (other elementary)
6	Grade Identification; 0 Fifth Grade 1 Sixth Grade 2 Seventh Grade 3 Eighth Grade 4 Ninth Grade 5 Tenth Grade 6 Eleventh Grade 7 Twelfth Grade
7, 8	Socio-economic Status Index (SES); Duncan, O. D. "A Socio-economic Index for All Occupations" (Taken from two chapters of a forthcoming book on occupations by Albert Reiss.) 2 df 00 Zero points : 96 Ninety-six points YY No information

9, 10, 11 I.Q. Classical Score (IQ); IPAT, Test of G, Culture Free, Scales 2A and 3A (for appropriate age groups). R. B. Cattell and A. K. S. Cattell 3 df

001 Score of one
:
199 Score of one hundred ninety-nine
YYY No information

12, 13 Rank Order Grade Point Average (GPA); Converted into percentiles by the following formula:

$1 - \frac{\text{Rank}}{N}$ 2df

00 Zero percentile
:
99 Ninety-ninth percentile
YY No information

14, 15 OAS Total Score; OCCUPATIONAL ASPIRATION SCALE, Revision 1, Copyright 1961 by A. O. Haller, Michigan State University, East Lansing, Michigan. 2 df

00 Score of zero
:
72 Score of seventy-two

16, 17 OAS Q_1; RS_1. Original North-Hatt score; "Jobs and Occupations: A Popular Evaluation" NORC, in CLASS, STATUS, AND POWER, Bendix R., and Lipset, S. M., Eds. Glencoe, Free Press, 1953. (See 14, 15 above.)

47 Night watchman
:
96 United States Supreme Court Justice

18, 19 OAS Q_3; RS_2. (See 16, 17 above.)

33 Shoeshiner
:
89 Scientist

20, 21 OAS RS DIFF $|Q_1 - Q_3|$ (See 16, 17 above.)

00 Minimum
:
63 Maximum

22, 23 OAS Q_2; IS_1. (See 16, 17 above.)

46 Clothes presser in a laundry
:
93 Physician (doctor)

24, 25 OAS Q_4; IS_2 (See 16, 17 above.)

34 Street sweeper
:
89 College professor

26, 27 OAS IS DIFF $|Q_2 - Q_4|$ (See 16, 17 above.)

00 Minimum
:
59 Maximum

28, 29, 30 OAS RS DIFF + IS DIFF (See 16, 17 above.)

000 Minimum
:
122 Maximum

31, 32 OAS Q_5; RL_1 (See 16, 17 above.)

45 Soda fountain clerk
:
93 State governor

33, 34 OAS Q_7; RL_2 (See 16, 17 above.)

35 Garbage collector
:
90 Mayor of a large city

35, 36 OAS RL DIFF $|Q_5 - Q_7|$ (See 16, 17 above.)

00 Minimum
:
58 Maximum

37, 38 OAS Q_6; IL_1 (See 16, 17 above.)

44 Janitor
:
92 Cabinet member in the federal gov't

39, 40 OAS Q_8; IL_2 (See 16, 17 above.)

40 Share cropper
:
92 Diplomat in the U. S. Foreign Service

41, 42 OAS IL DIFF $|Q_6 - Q_8|$ (See 16, 17 above.)

00 Minimum
:
52 Maximum

43, 44, 45 OAS RL DIFF + IL DIFF (See 16, 17 above.)

000 Minimum
:
110 Maximum

46, 47, 48 OAS RS DIFF + RL DIFF (See 16, 17 above.)

000 Minimum
:
121 Maximum

49, 50, 51 OAS IS DIFF + IL DIFF (See 16, 17 above.)

000 Minimum
:
111 Maximum

52, 53, 54 OAS RS DIFF + IS DIFF + RL DIFF + IL DIFF (See 16, 17 above.)

000 Minimum
:
232 Maximum

55, 56, 57 OAS Q_1 + Q_3 (RS) (See 16, 17 above.)

000 Minimum
:
185 Maximum

58, 59, 60 OAS Q_2 + Q_4 (IS) (See 16, 17 above.)

000 Minimum
:
182 Maximum

61, 62, 63 OAS Q_5 + Q_7 (RL) (See 16, 17 above.)

000 Minimum
:
183 Maximum

64, 65, 66 OAS Q_6 + Q_8 (IL) (See 16, 17 above.)

000 Minimum
:
184 Maximum

NOTE: The first sixty-six columns contain the basic information. To simplify data analysis by providing squares of certain values, Columns 67 through 79 are specially coded for three separate decks of cards as listed below. (Columns 1 through 66 remain the same for all decks.) Column 80 in each deck is reserved for deck identification as follows:

80	Deck Identification:
	1 Deck One
	2 Deck Two
	3 Deck Three

SPECIAL CODING - DECK ONE

67, 68, 69, 70, 71	DECK ONE (See Column 80.) RS^2
	$(Q_1 + Q_3)^2$ (See Columns 55, 56, 57.)
	00000 Minimum
	:
	34225 Maximum
72, 73, 74, 75	DECK ONE (See Column 80.) $RS\ DIFF^2$
	(See Columns 20, 21.)
	0000 Minimum
	:
	3969 Maximum
76, 77, 78, 79	DECK ONE (See Column 80.) $IS\ DIFF^2$
	(See Columns 26, 27.)
	0000 Minimum
	:
	3481 Maximum

SPECIAL CODING - DECK TWO

67, 68, 69, 70, 71	DECK TWO (See Column 80.) IS^2
	$(Q_2 + Q_4)^2$ (See Columns 58, 59, 60.)
	00000 Minimum
	:
	33124 Maximum

72, 73, 74, 75 DECK TWO (See Column 80.) RL DIFF^2
(See Columns 35, 36.)
0000 Minimum
:
3364 Maximum

76, 77, 78, 79 DECK TWO (See Column 80.) IL DIFF^2
(See Columns 41, 42.)
0000 Minimum
:
2704 Maximum

SPECIAL CODING - DECK THREE

67, 68, 69, 70, 71 DECK THREE (See Column 80.) RL^2
$(Q_5 + Q_7)^2$ (See Columns 61, 62, 63.)
00000 Minimum
:
33489 Maximum

72, 73, 74, 75, 76 DECK THREE (See Column 80.) IL^2
$(Q_6 + Q_8)^2$ (See Columns 64, 65, 66.)
00000 Minimum
:
33856 Maximum

77, 78, 79 DECK THREE (See Column 80.) These three columns left blank.

80 DECK IDENTIFICATION; (See p. 96)

1 Deck One
2 Deck Two
3 Deck Three

ROOM USE ONLY