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THE RELATIONSHIP OF MONTH OF BIRTH TO INTELLIGENCE

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THE RELATIONSHIP OF MONTH OF BIRTH TO INTELLIGENCE

A Thesis Submitted to the Graduate Division in Partial Fulfillment of the Requirement for the Degree of Master of Science

By

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ABSTRACT

The purpose of this study was to investigate the relationship of month of birth to intelligence through scores made on L. L. Thurstone's American Council on Education Psychological Examination by the entering freshmen of Kansas State Teachers College, Pittsburg, Kansas.

Through statistical analysis, the observed differences in means for months were found to be statistically significant, and the differences present probably due to factors other than chance.

In the sample used, June was the most favorable month of birth and the seasons of moderate temperature seemed more favorable for birth than seasons of extreme temperature.

An analysis of related studies and a comparison with the present study indicated June as the most favorable month and Spring as the most favorable season for birth of the individual with regard to intellectual ability.

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CHAPTER I

INTRODUCTION

Purpose of Study

Since time immemorial men, unable to bear the burden of personal weaknesses, have sought causative forces in the universe to ease the brunt of individual differences. To be deficient in mental or physical ability assumes a certain amount of lightness when one reflects on the possibility of natural forces working together to bring about such an event. Hence, astrology's rise to power from ancient Babylonia, attributing to the Gods of the planets and stars directive forces working upon men.

With the rise of science, the claims of astrology were disallowed. However, with further investigation, the question has arisen as to whether there may not have been some truth in the belief in the influence of the planets and stars.

"It is not good for mankind first to see the light of day in the last months of the year. Lady Luck smiles on the children of Spring. Mothers, bring forth your children in Spring."[1]

Such is the theory of Blonsky's, stated in his article,

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[1]Rudolf Pintner, "Intelligence and Month of Birth," Journal of Applied Psychology, XV (March-April, 1931) 151.

"Fruh-und Spaljahrkinder. Jahrbuch fur Kinderheilkunde."

This theory led others and the writer of this study to make investigations concerning birth date and intelligence. Questions prompting these efforts were:

1. Does a particular month imply a favorable or unfavorable predisposition with regard to intelligence?

2. Does a particular season imply a favorable or unfavorable predisposition with regard to intelligence?

The purpose of this study is to attempt to answer the above two questions.

Definition and Measurement of Intelligence

Because this study concerns gross intelligence and its measurement, it is in order to define the word "intelligence" and describe the means used in this study to measure it.

Gross score received on the American Council on Education Psychological Examination is used as the measure of intellectual ability in this problem. Because subdivisions of the test are not being compared, the writer accepts and offers L. L. Thurstone's definition--"The differentiation of exploring function of the receptors"[2]--as the index of intelligence. A higher score on the test would presume greater differentiative ability on the part of the individual.

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[2]The Nature of Intelligence (New York: Harcourt, Brace and Co., Inc., 1927), p. 163.

Related Studies

Several studies on the relationship of month of birth to intelligence have been made. These studies have grown out of Blonsky's original work.[3]

Blonsky's subjects consisted of 811 children. Of these, 265 were repeaters in school, 453 were children who had been tested by the Binet Scale, and 93 were children physically underdeveloped. As a control, he used 246 regular pupils. From this investigation it was noted that of the repeaters, a greater number were born in the last six months of the year. Of the children tested by the Binet Scale, the lowest mean I.Q. was found for the Winter months, the highest mean I.Q. was found for the Spring months, as may be seen in Table No. I.[4] Of the 93 cases tested for

TABLE I

MEAN I.Q. FOR SEASON OF BIRTH ON THE BINET AS REPORTED BY BLONSKY

Season of Birth	Mean I.Q.
Spring	84.3
Summer	81.5
Autumn	81.3
Winter	80.1

[3]Pintner, op. cit. p. 149.

[4]Ibid., p. 149.

physical development, a slight difference in favor of the first six months of the year was shown. Although small, Blonsky considered this difference significant. On the basis of these results, he concluded that month of birth influences mental and physical development.[5]

H. N. Fialkin and R. O. Beckman investigated the influence of month of birth on intelligence. Their subjects consisted of 3,189 adult men taken from an available number of 5,717. Each had been give the Pressey Senior Classification and Verification Tests and their scores converted into sigma ratings (a statistical method of comparison.) The resulting rank order of intelligence as expressed in sigma rating for each month is shown in Table No. II.[6]

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[5] Ibid., pp. 149-51.

[6] "The Influence of Month of Birth on the Intelligence Test Scores of Adults," Journal of Genetic Psychology, LII (March, 1938), 206.

TABLE II

MEAN SIGMA RATING FOR MONTH OF BIRTH AS REPORTED BY FIALKIN AND BECKMAN WITH CORRESPONDING RANK ORDER

Month of Birth	Rank Order	Mean Sigma Rating
January	7	6.61
February	12	6.39
March	9	6.59
April	5	6.64
May	2	6.73
June	3	6.69
July	4	6.67
August	10	6.56
September	1	6.76
October	8	6.60
November	11	6.50
December	6	6.62

The mean sigma ratings according to season of birth is shown in Table No. III.[7] A difference was shown to exist between the intelligence scores of persons born in moderate months and those born in cold months as well as between those born in Spring and those born in Winter.

From this, Fialkin and Beckman concluded that month of birth is a factor operative in influencing the test scores of adults, that adults born in Spring months score higher than those born in Winter months, and that month of birth is a factor of but slight effect.[8]

[7] Ibid., p. 206.

[8] Ibid., pp. 203-09.

TABLE III

MEAN SIGMA RATING FOR SEASON OF BIRTH AS REPORTED BY FIALKIN AND BECKMAN

Season of Birth		Mean Sigma Rating
Spring	April-June	6.69
Summer	July-September	6.66
Autumn	October-December	6.58
Winter	January-March	6.53

Rudolf Pintner, investigating intelligence and month of birth, collected data on 4,925 school children of all grades and ages. Of these children, 1,186 births were in warm months and 1,141 births were in cold months. As a basis for intelligence, the following test scores were translated into intelligence quotients: The National Intelligence Test, The Pintner Rapid Survey, The Terman Group, The Otis, The Haggerty Delta I and II, The Pintner Non-Language, The Pintner Cunningham, and the Detroit First Grade. The resulting rank order of intelligence quotient and mean intelligence quotient for each month is shown in Table No. IV.[9]

[9]Pintner, loc. cit., p. 151.

TABLE IV

MEAN INTELLIGENCE QUOTIENT FOR MONTH OF BIRTH AS REPORTED BY PINTNER WITH CORRESPONDING RANK ORDER

Month of Birth	Rank Order	Mean I.Q.
January	11	95.61
Feburary	10	96.08
March	9	96.13
April	6.5	96.76
May	5	97.05
June	3	97.80
July	4	97.08
August	8	96.62
September	2	97.97
October	1	98.50
November	12	95.58
December	6.5	96.76

The mean intelligence quotient ratings according to season of birth are shown in Table No. V.[10] None of the differences found were considered statistically significant. As a result of this effort, Pintner concluded that month of birth, with relation to intelligence, was not a general influence among urban children in the United States.[11]

[10] Ibid., p. 153.

[11] Ibid., pp. 149-54.

TABLE V

MEAN INTELLIGENCE QUOTIENT FOR SEASON OF BIRTH AS REPORTED BY PINTNER

Season of Birth		Mean I.Q.
Spring	April-June	97.20
Summer	July-September	97.20
Autumn	October-December	97.10
Winter	January-March	95.95

Rudolf Pintner and George Forlano investigated the influence of month of birth on intelligence quotients through data concerning 17,502 children enrolled in primary grade school and high school. As a basis for intellectual ability, intelligence quotients were derived through administration of: The Stanford Revision of the Binet-Simon Scale, The Pintner Rapid Survey, The National Intelligence, The Haggerty Delta I, The Pintner-Cunningham Primary, The Terman Group, The Pintner Intelligence, The Otis Primary, The Otis Self-Administering, The Pintner Non-Language Primary, The Dearborn A. and C., The Detroit Primary and the Miller Mental Ability Tests. The resulting rank order of intelligence for each month as expressed in intelligence quotient and mean intelligence quotient for each month is shown in Table No. VI.[12] Mean mental ratings

12"The Influence of Month of Birth on Intelligence Quotients," The Journal of Educational Psychology, XXIV (Nov., 1933), 570.

TABLE VI

MEAN INTELLIGENCE QUOTIENT FOR MONTH OF BIRTH AS REPORTED BY PINTNER AND FORLANO WITH CORRESPONDING RANK ORDER

Month of Birth	Rank Order	Mean I.Q.
January	11	100.40
February	12	100.35
March	9	101.25
April	3	102.40
May	6	102.10
June	1.5	102.60
July	5	102.20
August	8	101.40
September	1.5	102.60
October	7	102.04
November	4	102.25
December	10	101.20

according to season of birth are shown in Table No. VII.[13]

TABLE VII

MEAN MENTAL RATING FOR SEASON OF BIRTH

AS REPORTED BY PINTNER AND FORLANO

Season of Birth		Mean Mental Rating
Spring	April-June	115.25
Summer	July-September	115.55
Autumn	October-December	115.85
Winter	January-March	113.95

[13] Ibid., p. 572.

As is shown, the lowest mean shows up consistently for the winter months (January to March). The mean difference between Winter and the highest seasonal mean is 1.70 and is statistically reliable. From this, Pintner and Forlano conclude that the lower I.Q. of children born in Winter months is evident and offers a suggestion that this might be due to constitutional impairment which is later reflected in a lowered I.Q.[14]

Omar C. Held investigated the influence of month of birth on the intelligence of college freshmen through data gathered on 2,327 University of Pittsburgh students. The test used to indicate intellectual ability was the American Council on Education Psychological Examination. The score for each student was converted into percentile. Rank order of each month and the mean percentile for each month is shown in Table No. VIII.[15] The mean percentile according to season of birth is shown in Table No. IX.[16] As is shown, summer had the highest mean; winter had the lowest mean. The difference was found to be statistically unreliable. From these findings, Held concluded that month of birth and season of birth had no influence on the intelligence of the

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[14] Ibid., pp. 561-584.

[15] "The Influence of Month of Birth on the Intelligence of College Freshmen," The Journal of Genetic Psychology, LVII (September, 1940), 213.

[16] Ibid., p. 215

subjects studied, and that the differences which existed were not statistically reliable.[17]

TABLE VIII

MEAN PERCENTILE RATING FOR MONTH OF BIRTH AS REPORTED BY HELD WITH CORRESPONDING RANK ORDER

Month of Birth	Rank Order	Mean %
January	10	48.6
February	7	49.9
March	8	49.5
April	12	47.3
May	3.5	50.6
June	2	51.8
July	3.5	50.6
August	11	48.1
September	1	52.8
October	9	49.2
November	6	50.3
December	3.5	50.6

TABLE IX

MEAN PERCENTILE FOR SEASON OF BIRTH AS REPORTED BY HELD

Season of Birth		Mean %
Spring	April-June	49.8
Summer	July-September	50.4
Autumn	October-December	50.0
Winter	January-March	49.3

[17] Ibid., pp. 211-217.

Summary of Related Studies

Five studies concerning the relationship of month of birth to intelligence have been presented. The data studied have concerned a different number of individuals, different type groups, and different means for determining intellectual ability. Results have been inconsistent and in some cases statistically unreliable. Conclusions have varied, from the belief that month of birth has no effect on intellectual ability to the belief that month of birth has an effect on intellectual ability.

CHAPTER II

PROCEDURE, RESULTS, AND CONCLUSIONS

Descriptive Data of Present Study

The present study included 848 test scores made on L. L. Thurstone's American Council on Education Psychological Test for Entering Freshmen, Forms 1940, 1942, 1944, 1945, 1946, and 1947. This included all test scores available for years 1940 to 1947 inclusive. The range of scores was from 24 to 160 of a possible 200 digit score points.

The mean scores for each month, years 1940-1947, with their standard deviations, are shown in Table No. X. This table also shows the number of test scores on which each mean is based. The centile score value for each mean may be approximated by location on the centile scale accompanying the table.

It can be seen that the mean scores range from 89.3 to 99.86, a range of 11.56.

Redistributing the individual scores into means for years 1940 to 1947 gave the results shown in Table No. XI. From this table it may be noted that the mean scores ranged from 89.57 to 100.86, a range of 12.29.

A survey of these differences then raised the further question of the extent to which they were due to each of the factors, month of birth, sex of the individual, and form of

TABLE X

THE MEAN, STANDARD DEVIATION AND NUMBER OF SCORES FOR EACH MONTH OBTAINED IN THE PRESENT STUDY

APPROXIMATE % EQUIVALENT FOR SCORES

Month	Mean	S.D.	No.	Score	Centile
Jan.	94.61	23.79	80	20 - 29	0
Feb.	89.30	24.90	80	30 - 39	.2
March	91.95	27.42	66	40 - 49	.9
Apr.	90.14	26.60	63	50 - 59	2.4
May	96.50	23.70	66	60 - 69	5.1
June	99.86	25.53	72	70 - 79	9.8
July	91.88	26.70	65	80 - 89	16.9
Aug.	95.64	26.88	73	90 - 99	26.9
Sept.	93.75	19.77	76	100 - 109	40.6
Oct.	94.84	25.82	80	110 - 119	55.9
Nov.	94.60	25.31	60	120 - 129	69.9
Dec.	92.99	28.10	67	130 - 139	81.7
				140 - 149	90.6
				150 - 159	95.8
				160 - 169	98.7

test used? For this purpose analysis of variance was used.

TABLE XI

THE MEAN AND NUMBER OF SCORES FOR YEARS

1940, 1942, 1944, 1945, 1946, 1947

Year	No.	Mean
1940	92	89.57
1942	187	92.89
1944	83	93.23
1945	124	100.86
1946	164	95.39
1947	198	91.38

Analysis of Variance: General Procedure

In order to facilitate analysis of variance, the 848 individual test scores so collected were placed into 144 groups according to sex, month of birth, and form of test used, and later placed into 72 groups according to month of birth and form of test used. The number and means of these groups are arranged in Appendices I and II. To the former group was applied the statistical technique of analysis of variance into three components[1]; to the latter group was applied the statistical technique of analysis of variance into two components.[2] Following this procedure, Lindquist's "Table for F"[3] was consulted to determine if the differences found in the means for months, the differences found in the means for years, and the differences found in the means for sexes were statistically significant at the one or five per cent level.

Analysis of Variance into Three Components

When sex, month of birth, and form of test used were considered, the following results were obtained, as shown in Table No. XII. (Raw data in Appendix I)

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[1]E. F. Lindquist, Statistical Analysis in Educational Research (New York: Houghton Mifflin Co., 1940), pp. 104-13.

[2]Ibid., pp. 93-99.

[3]Ibid., pp. 63-65.

According to Table No. XII, the variance for month divided by the variance for error produced an "F" of 1.5; the

TABLE XII

RESULTS OF ANALYSIS OF VARIANCE FOR THREE COMPONENTS OF THE PRESENT STUDY, SEX, MONTH OF BIRTH, AND FORM OF TEST USED

Component	d.f.	Sum of Sq.	Variance	"F"
Month	11	5698.46030	518.041845	1.5
Sex	1	164.35807	164.35807	.475
Year	5	5120.34695	1024.06939	2.965
Error	126	43515.53248	345.36130	
Total	143	54498.6978		

variance for sex divided by the variance for error produced an "F" of .475; the variance for year divided by the variance for error produced an "F" of 2.965.

The component, year, was statistically significant at the five per cent level. Such a finding would indicate that form of test used was probably responsible for differences in means from year to year.

Since the blank spaces in the chart used in this analysis distorted the estimate of variance, a more valid estimate of "F" can be obtained by eliminating differences due to sex and using only two components for analysis. This means that in the chart found in Appendix II each item

represents the mean score for both men and women and we have left only the two variables, month and form of test.

Analysis of Variance into Two Components

When month of birth and form of test used were considered in the analysis of variance, the following items resulted, as shown in Table No. XIII.

TABLE XIII

RESULTS OF ANALYSIS OF VARIANCE OF TWO COMPONENTS OF THE PRESENT STUDY, MONTH OF BIRTH AND THE FORM OF TEST USED

Component	d.f.	Sum of Sq.	Variance	"F"
Month	11	715.47433	65.04312	2.715
Year	5	601.98383	120.39676	5.026
Error	55	1317.45816	23.95378	
Total	71	2634.91632		

These ratios were found, through reference to Lindquist's "Table for F",[4] to be of statistical significance at the five per cent level.

We may then conclude that the differences between means found in this study are not altogether due to chance and that month of birth was a factor influencing the differences found.

[4] Ibid., pp. 62-65.

Application and Findings of "t"-Test

With this conclusion established, it was essential that an estimate of significance for differences between individual monthly means be established. To do this, the "t"-test[5] was applied. The formula for "t" is as follows:

$$t = \frac{M_1 - M_2}{\sqrt{\left(\frac{\Sigma d_1^2 + \Sigma d_2^2}{n_1 + n_2 - 2}\right)\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}}$$

In all, sixty-six possible combinations were paired to ascertain the significance of both differences due to mean and differences due to deviations. The results of this are shown in Table No. XIV.

TABLE XIV

RESULTS OF APPLICATION OF TEST FOR "t"

Months	Rank Order	"t" Value	%
June-Aug.	1 - 2	.174731	90
" -Jan.	1 - 3	.705539	50
" -May	1 - 4	.865612	50
" -Nov.	1 - 5	1.013667	30
" -Oct.	1 - 6	.976344	40
" -Sept.	1 - 7	1.531353	20
" -July	1 - 8	1.05301	25

[5] Ibid., p. 57.

Months	Rank Order	"t" Value	%
June-March	1 - 9	1.407142	20
" -April	1 - 10	1.295109	20
" -Dec.	1 - 11	1.776470	20
" -Feb.	1 - 12	2.395833	5
Aug.-Jan.	2 - 3	.602041	60
" -May	2 - 4	.785263	50
" -Nov.	2 - 5	.945273	40
" -Oct.	2 - 6	.904651	40
" -Sept.	2 - 7	1.638211	20
" -July	2 - 8	.9865125	40
" -March	2 - 9	1.376963	20
" -April	2 - 10	1.239858	30
" -Dec.	2 - 11	1.755741	20
" -Feb.	2 - 12	2.507331	5
Jan.-May	3 - 4	.432671	70
" -Nov.	3 - 5	.539893	70
" -Oct.	3 - 6	.523456	70
" -Sept.	3 - 7	1.124378	30
" -July	3 - 8	.671342	60
" -March	3 - 9	.985875	40
" -April	3 - 10	.954627	40
" -Dec.	3 - 11	1.452954	20
" -Feb.	3 - 12	2.187096	10
May-Nov.	4 - 5	.132075	90
" -Oct.	4 - 6	.029038	90
" -Sept.	4 - 7	.070921	90
" -July	4 - 8	.223113	90
" -March	4 - 9	.297665	80
" -April	4 - 10	.521327	70
" -Dec.	4 - 11	.7932203	50
" -Feb.	4 - 12	.993814	40
Nov.-Oct.	5 - 6	.018367	90
" -Sept.	5 - 7	.067647	90
" -July	5 - 8	.233743	90
" -March	5 - 9	.325892	80
" -April	5 - 10	.526916	70
" -Dec.	5 - 11	.864915	50
" -Feb.	5 - 12	1.147342	30

Months	Rank Order	"t" Value	%
Oct.-Sept.	6 - 7	.0376344	90
" -July	6 - 8	.208828	90
" -March	6 - 9	.289640	80
" -April	6 - 10	.496835	70
" -Dec.	6 - 11	.815884	50
" -Feb.	6 - 12	1.056689	40
Sept.-July	7 - 8	.230932	90
" -March	7 - 9	.390476	70
" -April	7 - 10	.57142	60
" -Dec.	7 - 11	1.02336	40
" -Feb.	7 - 12	1.70566	20
July-March	8 - 9	.025225	90
" -April	8 - 10	.274820	90
" -Dec.	8 - 11	.525559	70
" -Feb.	8 - 12	.64962	60
March-April	9 - 10	.295	80
" -Dec.	9 - 11	.6081	60
" -Feb.	9 - 12	.83502	50
April-Dec.	10 - 11	.20720	90
" -Feb.	10 - 12	.26434	80
Dec.-Feb.	11 - 12	.02862	90

From this table, it may be seen there is some general approach to significance in the extreme deviations of rank order of mean.

Because of this, the assumption is made that the cause of such deviations is due to factors other than chance.

Comparison of Present Study with Previous Studies

The appropriate question which next arose was--how do

the findings of the present study compare with the related studies considered earlier? To answer this, the writer felt that comparison of rank orders according to month and season would portray similarities and dissimilarities.

Table No. XV presents rank order for month of birth as reported by the writers of related studies and the present writer. Table No. XVI presents a composite of the rank orders for month compared with those of the present writer. Table No. XVII presents the composite seasonal rank orders compared with the seasonal rank order of the present writer.

From Table No. XV one may see several points of

TABLE XV

A COMPARATIVE ILLUSTRATION OF RANK ORDER OF MONTHLY MEAN SCORES AS REPORTED BY FIALKIN-BECKMAN, PINTNER PINTNER-FORLANO, HELD, AND THE WRITER

Month	Fialkin-Beckman-Pintner-	-Pintner-Forlano-		-Present -Held
Jan.	7	11	11	10 5
Feb.	12	10	12	7 12
March	9	9	9	8 9
April	5	6.5	3	12 11
May	2	5	6	3.5 2
June	3	3	1.5	2 1
July	4	4	5	3.5 10
Aug.	10	8	8	11 3
Sept.	1	2	1.5	1 7
Oct.	8	1	7	9 4
Nov.	11	12	4	6 6
Dec.	6	6.5	10	3.5 8

agreement. Pintner and Pintner-Forlano had January ranked as (11). Fialkin-Beckman, Pintner-Forlano, and the present writer had February ranked as (12). Fialkin-Beckman, Pintner, Pintner-Forlano, and the present writer had March ranked as (9). Fialkin-Beckman and the present writer had May ranked as (2). Fialkin-Beckman and Pintner had June ranked as (3). Pintner-Forlano and the present writer had June ranked as (1). Fialkin-Beckman and Pintner had July ranked as (4). Pintner and Pintner-Forlano had August ranked as (8). Fialkin-Beckman, Pintner-Forlano, and Held had September ranked as (1). Held and the present writer had November ranked as (6). Fialkin-Beckman and Pintner had December ranked as (6). In considering these similarities, it was also noted that Pintner-Forlano ranked June and October as (1.5). Pintner ranked April and December as (6.5).

Comparison of rank order of the present study with the composite rank order of combined studies, as shown in Table No. XVI, showed few similarities, but it was noted that in both instances larger rank order appeared in the extreme months (Jan.-Feb.-March-Oct.-Nov.-Dec.) and smaller rank order was more centrally located (April-May-June-July-Aug.-Sept.)

TABLE XVI

A COMPOSITE OF THE RANK ORDERS OF THE MONTHLY MEANS OF FIALKIN-BECKMAN, PINTNER, PINTNER-FORLANO, HELD, AND THE WRITER

Month	Present Rank Order	Composite Rank Order
Jan.	5	10.5
Feb.	12	12
March	9	10.5
April	11	8
May	2	3
June	1	1
July	10	5
August	3	9
Sept.	7	2
Oct.	4	6
Nov.	6	7
Dec.	8	4

Seasonal rank order, as shown in Table No. XVII gives similar results.

As shown in Table No. XVII, in both instances, Winter had the lowest rank order; Spring had the highest rank order. This coincides with Blonsky's earlier statement that Spring was the most favorable time for mothers to bear children.

TABLE XVII

SEASONAL RANK ORDER AS COMPUTED FROM COMPOSITE MONTHLY RANK ORDER BASED ON STUDIES BY FIALKIN-BECKMAN, PINTNER, PINTNER-FORLANO, HELD, AND THE WRITER

Season of Birth		Composite Rank Order	Present
Winter	Jan.-March	4	4
Spring	April-June	1	1
Summer	July-Sept.	2	3
Autumn	Oct.-Dec.	3	2

Conclusions

For the sample used in this study the following conclusions may be drawn:

1. Accumulated data on several studies and the present study indicate that a relationship seems to exist between month of birth and intelligence.

2. In this study, individuals born in Spring produced higher mean scores on L. L. Thurstone's American Council on Education Psychological Test for Entering Freshmen than those born in other seasons. Season of birth seems to be a factor which determines, in part, intellectual ability.

3. June is indicated by this study as being most favorable, with regard to intellectual ability, for birth of the individual.

4. Test scores for the various years of this study were not considered comparable.

Suggestions

As an outcome of this study, the writer proposes the following suggestions as topics for future research:

1. Do the effects of month of birth, which seem apparent with regard to intellectual ability, operate in determining the physical status of the individual?

2. What are the forces which seemingly contribute to the differences in organic status?

3. Would the application of such findings, if favorable, be socially and economically sound; or would the application of the same be of negligible value to humanity?

CHAPTER III

SUMMARY

Scores made by the entering freshmen of Kansas State Teachers College, Pittsburg, Kansas on L. L. Thurstone's American Council on Education Psychological Examination were collected to investigate the relationship between month of birth and intelligence.

Observation revealed differences between monthly means and yearly means.

Analysis of variance indicated statistical significance between monthly means and yearly means.

Application of the "t"-test indicated the differences found were due to factors other than chance.

Comparison of the present study with related studies showed similarities existing in monthly rank order and seasonal rank order.

For the sample used in this study, the following conclusions were drawn:

1. In the present study, a relationship seemed to exist between month of birth and intelligence.

2. Individuals born in the Spring months had the highest scores on L. L. Thurstone's American Council on Education Psychological Examination.

3. Those born in June had the highest scores on L. L.

Thurstone's American Council on Education Psychological Examination.

4. Test scores for the different years of the study were not considered comparable.

Suggestions offered included the following research topics:

1. What relationship exists between month of birth and physical status of the individual?

2. What is the cause of such differences?

3. How would one apply such findings, if any?

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APPENDICES

APPENDIX A

MEANS USED IN ANALYSIS OF VARIANCE FOR THREE COMPONENTS

Month of Birth	Form of Test	Sex	No.	Mean
January	1940	Male	5	104.50
		Female	4	74.00
	1942	Male	13	86.00
		Female	10	100.50
	1944	Male	0	------
		Female	6	98.33
	1945	Male	3	100.00
		Female	7	103.43
	1946	Male	7	100.56
		Female	4	92.25
	1947	Male	11	100.91
		Female	10	83.10
February	1940	Male	8	83.00
		Female	4	82.50
	1942	Male	6	89.83
		Female	7	85.14
	1944	Male	2	89.50
		Female	7	83.43
	1945	Male	3	87.00
		Female	10	98.14
	1946	Male	6	110.33
		Female	12	92.17
	1947	Male	10	85.20
		Female	8	85.50
March	1940	Male	3	86.67
		Female	2	92.00
	1942	Male	10	90.40
		Female	6	98.33
	1944	Male	3	76.67
		Female	5	101.60
	1945	Male	2	132.00
		Female	7	98.27
	1946	Male	7	86.56
		Female	3	77.00
	1947	Male	10	86.70
		Female	8	92.13
April	1940	Male	5	94.00
		Female	3	52.67
	1942	Male	9	99.56
		Female	4	88.25

MEANS USED IN ANALYSIS OF VARIANCE FOR THREE COMPONENTS

Month of Birth	Form of Test	Sex	No.	Mean
April	1944	Male	4	98.75
		Female	4	122.25
	1945	Male	2	68.00
		Female	9	102.00
	1946	Male	2	80.00
		Female	7	78.14
	1947	Male	8	72.88
		Female	6	96.33
May	1940	Male	1	80.00
		Female	1	79.00
	1942	Male	4	93.00
		Female	8	103.75
	1944	Male	2	92.50
		Female	2	78.00
	1945	Male	3	110.33
		Female	9	106.67
	1946	Male	4	107.00
		Female	5	88.60
	1947	Male	11	86.82
		Female	16	97.38
June	1940	Male	7	93.56
		Female	5	85.40
	1942	Male	8	100.63
		Female	5	79.50
	1944	Male	3	100.33
		Female	1	91.00
	1945	Male	1	101.00
		Female	5	94.00
	1946	Male	4	118.50
		Female	16	106.56
	1947	Male	9	100.00
		Female	8	107.88
July	1940	Male	9	108.00
		Female	2	81.50
	1942	Male	6	97.16
		Female	5	91.00
	1944	Male	2	114.00
		Female	5	104.40
	1945	Male	1	107.00
		Female	5	72.60
	1946	Male	5	87.80
		Female	7	79.00
	1947	Male	13	90.46
		Female	5	82.20

MEANS USED IN ANALYSIS OF VARIANCE FOR THREE COMPONENTS

Month of Birth	Form of Test	Sex	No.	Mean
August	1940	Male	4	99.50
		Female	1	112.00
	1942	Male	14	85.43
		Female	3	109.00
	1944	Male	3	103.67
		Female	6	103.83
	1945	Male	6	94.17
		Female	5	97.20
	1946	Male	6	104.50
		Female	5	96.80
	1947	Male	11	102.27
		Female	9	80.89
September	1940	Male	5	98.20
		Female	6	88.00
	1942	Male	9	83.56
		Female	10	103.90
	1944	Male	0	-----
		Female	8	90.13
	1945	Male	3	117.67
		Female	7	84.00
	1946	Male	12	100.50
		Female	3	78.67
	1947	Male	6	88.00
		Female	7	97.57
October	1940	Male	7	90.43
		Female	2	67.00
	1942	Male	9	85.77
		Female	8	99.38
	1944	Male	2	112.00
		Female	6	79.17
	1945	Male	9	111.78
		Female	6	107.17
	1946	Male	9	95.56
		Female	4	79.25
	1947	Male	12	90.50
		Female	6	107.00
November	1940	Male	3	83.00
		Female	2	86.50
	1942	Male	6	98.78
		Female	9	92.33
	1944	Male	4	85.50
		Female	3	90.33

MEANS USED IN ANALYSIS OF VARIANCE FOR THREE COMPONENTS

Month of Birth	Form of Test	Sex	No.	Mean
November	1945	Male	6	121.83
		Female	8	89.00
	1946	Male	4	89.25
		Female	6	88.33
	1947	Male	5	112.60
		Female	4	91.25
December	1940	Male	0	-----
		Female	3	87.33
	1942	Male	13	89.38
		Female	5	93.60
	1944	Male	0	-----
		Female	5	71.40
	1945	Male	2	84.50
		Female	8	105.50
	1946	Male	9	90.56
		Female	9	102.37
	1947	Male	7	85.86
		Female	6	88.50

APPENDIX B

MEANS USED IN ANALYSIS OF VARIANCE FOR TWO COMPONENTS

Month of Birth	Form of Test	No.	Mean
January	1940	9	90.94
	1942	23	92.31
	1944	6	98.33
	1945	10	102.40
	1946	11	97.54
	1947	21	92.43
February	1940	12	82.83
	1942	13	87.30
	1944	9	84.78
	1945	13	94.80
	1946	18	98.22
	1947	18	85.33
March	1940	5	88.80
	1942	16	93.37
	1944	8	92.25
	1945	9	105.77
	1946	10	83.69
	1947	18	89.11
April	1940	8	78.50
	1942	13	96.08
	1944	8	110.50
	1945	11	95.82
	1946	9	78.55
	1947	14	82.93
May	1940	2	79.50
	1942	12	100.00
	1944	4	85.25
	1945	12	107.59
	1946	9	96.78
	1947	27	93.08
June	1940	12	90.16
	1942	13	92.50
	1944	4	98.00
	1945	6	95.17
	1946	20	108.95
	1947	17	103.71

MEANS USED IN ANALYSIS OF VARIANCE FOR TWO COMPONENTS

Month of Birth	Form of Test	No.	Mean
July	1940	11	103.18
	1942	11	94.36
	1944	7	107.14
	1945	6	78.33
	1946	12	82.67
	1947	18	88.17
August	1940	5	102.00
	1942	17	89.59
	1944	9	103.78
	1945	11	95.55
	1946	11	101.00
	1947	20	92.65
September	1940	11	92.64
	1942	19	94.27
	1944	8	90.13
	1945	10	94.10
	1946	15	96.13
	1947	13	93.15
October	1940	9	85.22
	1942	17	92.17
	1944	8	87.38
	1945	15	109.94
	1946	13	90.54
	1947	18	96.00
November	1940	6	84.40
	1942	15	94.91
	1944	7	87.57
	1945	14	103.07
	1946	10	88.70
	1947	9	103.11
December	1940	3	87.33
	1942	18	90.55
	1944	5	71.40
	1945	10	101.30
	1946	18	96.47
	1947	13	87.08