SOME SOURCES OF VARIATION IN THE FAMILY SIZE OF COLLEGE GRADUATES

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CONSIDERABLE amount of time, energy, and money has been devoted over the last two decades to the study of the social and psychological factors associated with the fertility of the American population, taken as a whole. It may seem odd, therefore, that research dealing with the social psychology of family size among college graduates should still be in an exploratory stage. This fact is especially curious when one recalls that the comparatively low birth rate of the college-educated population was one of the first topics to attract the attention of demographers early in this century. The lack of research about the sources of variations in the family size of college graduates also seems strange in view of the survey of the fertility of this group which has been conducted each year since 1946. It would appear that the authors of previous studies have been satisfied largely with demonstrating certain simple facts relating to fertility. The earliest studies, for instance, emphasized the discovery that the family size of college graduates was diminishing from 1850 onward. The most recent investigations have given all their attention to the fact that fertility in the college-educated population is now on the upswing. In other words, research has not been sufficiently concerned with understanding the phenomenon under study to raise questions about the range and distribution of the variation in the family size of college graduates. Previous studies also have failed to investigate the differences, in terms of social and psychological characteristics, between those graduates who have small families and others who have many chil-

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dren.² These are the questions which the study reported in the present paper has attempted to explore.

The sample to whose fertility behavior these questions have been addressed consists of 95 men who graduated from an eastern Ivy League College in 1940. They were chosen as subjects for the reason that a wealth of data, consisting of information on approximately forty of their social and psychological characteristics, had been collected by Bender and was readily available for analysis. Bender obtained these data while the men were still seniors in college, as part of a study he was conducting in 1939-40 dealing with the relationship between motivation in college and visual deficiencies.³ In order to make the data usable at the present time for the purposes of the investigation reported here, the materials Bender had assembled were supplemented by means of a mailed questionnaire sent to each of the respondents in the original study, inquiring about such matters as present occupation, marital history, number of children, and other additional information. Further data from the files of the college's alumni record office were made available to the authors.4

In 1939–1940, Bender chose 124 seniors to serve as subjects for his research. They were selected for a variety of reasons, but when examined in terms of scholastic aptitude and performance, the group was judged representative of the entire

³ Bender's original study is fully described in Bender, Irving E., et al.: MOTIVA-TION AND VISUAL FACTORS, Hanover, N. H.: Dartmouth College Publications, 1942.

⁴ Information about other aspects of fertility, including ideal family size, number of children planned, duration of marriage to first birth and between successive births was also collected. Some of the additional data are discussed in the present paper but most of them will be reported subsequently.

² An exception to this statement is the paper by Osborn who, in his study of Princeton alumni, compared the fertility of graduates in terms of occupation and scholastic average. See Osborn, John J.: Fertility Differentials among Princeton Alumni, Journal of Heredity, 1939, 30, pp. 565-567. Phillips, who wrote several papers on the birth rate among Harvard graduates of the nineteenth century, did, in one of his papers, relate a very crude and questionable index of vocational success to number of children. See Phillips, John C.: Success and the Birth Rate, Harvard Graduates Magazine, 1937, 35, pp. 565-570. The 1956 survey of the fertility of college graduates, conducted annually since 1946 by the Population Reference Bureau, has, for the first time since the survey was inaugurated, tried to break down the over-all results in terms of factors which may be interpreted as approximate versions of the influence of socio-economic status and religious affiliation.

senior class.⁵ Of the 124 subjects, 118 had survived to 1955, when it was decided to investigate their fertility. The mailed questionnaire was addressed to each one of the 118 during the late Spring of 1955, and by the autumn of the same year, when the analysis of the data was begun, 101 men, or 85 per cent of the 118 survivors, had replied. Of this latter number, 5 were still single, 1 was divorced and 95 were married. It is with these 95 men that our report deals.⁶

The Range of Family Size Among the Graduates

Within fifteen years of their graduation from college, i.e., in the Spring of 1955, the married graduates had an average of 2.43 children, with many years of fecund life still ahead of them. Of the ninety-five men, 5 still had no children, 9 had one child, 35 had two children, 33 had three, 12 had four and 1 had five offspring.

Two questions were asked of men in the sample in an attempt to estimate their *completed* fertility. First of all, they were asked what they considered their ideal family size. The distribution of their replies is given in Table 1. In terms of this question, and assuming that the stated ideal represents their own plans, the average size of the intended family was 3.14. A second question, introduced as a means of corroborating the interpretation of the responses to the question on ideal

⁵ Bender, et al.: op. cit., pp. 47-48.

⁶ We have compared the 101 men who made returns by the time the analysis of the data was started, in the autumn of 1955, with the 118 survivors to whom questionnaires were sent. The comparison was made in terms of the following characteristics: father's occupation; parents' education; total number of siblings; religious denomination; major in college; academic standing in college; and job mobility since leaving college (information about the last factor was obtained from the alumni record office). We found no significant differences between the group of 101 men and the 118 men in terms of any of these characteristics. The 17 men who did not make returns do, however, differ significantly both from the group of 118 survivors and from the 101 men who made returns, in terms of three characteristics. Those who did not respond to the questionnaire had fewer siblings, stood much lower academically and have had much greater job mobility. In view of the results reported later in this paper, we tend to believe that these characteristics imply that the 17 men have fewer children than the sample whose fertility behavior we have investigated. Therefore, the average fertility of the married men among the 118 survivors is probably a little lower than the average of 2.43 reported for the 95 married men we have studied.

family size, inquired how many more children the respondents wanted-if they already had offspring-or how many they planned to have-if in 1955 they still had none. Table 1 also shows the results of the replies to this question. The size of the average intended family in terms of this procedure is 3.08. a result which comes exceedingly close to the answer obtained through the use of the first question.

To put it in another way, we can say that the range of fertility among the graduates, judged in terms of family size fifteen years after graduation, is from 0 children to 5 children. with the heaviest concentration in the middle of the range. If the group fulfills its plans as expressed in their responses to the questionnaire, this range will be altered somewhat, since no graduate plans to remain childless and there may be a few

Number of Children	Number of Gradu- ates With Stated Number of Children	Number of Gradu- ates For Whom Number of Chil- dren Represents "Ideal Family Size" ¹	Number of Gradu- ates For Whom Number of Chil- dren Represents Intended Number
None	5	0 (0)	0
One	9	0 (1)	2
One or Two		2	_
Two	35	8 (20)	25
Two or Three		22	
Three	33	14 (36)	31
Three or Four	—	22	
Four	12	7 (22)	16
Four or Five	—	8	
Five or More	1ª	2 (6)	6
No Answer	_	10 (10)	15
Total	95	95	95

Table 1. Number of children, ideal family size and intended number of children among 95 married male graduates.

¹ In interpreting this column, it should be realized that "One or Two," "Two or Three," etc. were were stated alternatives in the question relating to ideal family size but not in the questions on which the data for number of children intended are based. If we allocate each of the "or" responses to the adjoining alternatives, the responses in parentheses result. For example, the figure in this column which shows that 20 respondents had an ideal family size of two children was obtained by adding to the 8 men who stated that two was the ideal family size, one-half the number of re-sponses in the "One or Two" category, or 1 respondent; plus one-half the number in the "Two or Three" category, or 11 more men. • This graduate had five children.

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families with more than five offspring.⁷ The average level of fertility should be more than adequate for replacement.⁸

THE FACTORS ASSOCIATED WITH VARIATION IN FAMILY SIZE

How do the members of the sample who have small families fifteen years after graduation differ from the men who have three, four or five children? In discussing our answers to this question, we wish to emphasize that our results are limited by the kinds of relationships it was possible for us to investigate given the fact that the available data were collected by Bender with the different purposes of his original study in mind. This has meant that certain factors which we suspected might be associated with fertility differences could not be studied, such as the influence of the wife's background and attitudes on the number of children. On the other hand, we have examined the association between fertility and a large number of variables which, had this not been an exploratory study, we might have ignored.⁹

Three different techniques of analysis were employed in studying the data, depending upon the nature of the independent variable to which fertility was being related. The following three groups of independent variables were all related to fertility by dichotomizing the variables, computing phi coefficients, and then testing the coefficients for statistical significance at the 5 per cent level of probability. The dependent variable, number of children, was also dichotomized, using respondents with "0 to 2 children" and those with "3 or more children" as the two groups.

A. Independent Variables Indicating the Social Background of the Respondent.

⁷ One graduate has adopted children but he has been classified as "childless." It will be interesting to see who among those that are now "childless" will have children "naturally," or will adopt children or will never have a family.

⁹ Information was available about the educational experience of the wife but this variable was not significantly related to number of children. See Table 2.

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⁸ It has been estimated that an average of 2.15 children is necessary for replacement among college graduates. Population Reference Bureau, *Population Bulletin*, 1956, 12, p. 90. This figure obviously relates to all graduates, not simply married ones.

1. Type of School at Which the Respondent Prepared for College. Fifteen respondents had attended a private preparatory school and 80 came to college directly from a public high school.

2. Occupation of Respondent's Father. The information relating to this variable was scanty and only two broad groups could be established: 32 respondents had fathers who were in the professions and 60 had fathers who were business men. Of the 95 men in the sample, only three had fathers whose occupations would place them below the middle class, and these respondents were excluded in the analysis of this particular variable.¹⁰

3. Parents' Education. For 43 respondents neither parent had attended college for any period. For 52 respondents at least one parent had spent some time in college.

4. Total Number of Siblings. Forty-eight respondents were either only children or had one sibling. Forty-one respondents had two or more siblings.¹¹

5. Number of Male Siblings. Thirty-nine respondents had no brothers and 50 had one or more brothers.

6. Number of Female Siblings. Forty-seven respondents had no sisters and 42 had one or more sisters.

7. Religious Denomination. Of the ninety-five married men in our sample, 78 were Protestants, 9 were Catholics and 8 were Jews.

B. Independent Variables Indicative of the Respondent's Career in College.

1. Major Subject. Thirty-one respondents concentrated their studies in the Humanities, 10 in the Natural Sciences and 54 in the Social Sciences.

2. Extra-Curricular Activity. Fifty-four respondents engaged in fewer than four extra-curricular activities and 37 participated in four or more.

3. Academic Standing. Forty-four respondents stood in the upper half of their class and 51 respondents were below the fiftieth percentile.

¹⁰ The reader is advised to keep this fact in mind in thinking about the implications of our results. It means that the subjects, being graduates of an Ivy League College, probably come from a higher social class than the average for college graduates of the same year in the United States as a whole.

¹¹ Where the sum of the men in each of the groups created by the dichotomy is less than 95, as in the case of this variable, the deficiency can be attributed to lack of information relating to the variable for some of the respondents in the sample.

C. Independent Variables Indicating the Respondent's Career Between Graduation in 1940 and 1955 Survey.

1. Job Mobility. Seventy respondents held only one or two different jobs between 1945 and 1955 while 25 respondents had held three or more jobs in the same period.

2. Civic Participation. Sixty-eight respondents participated actively in civic affairs and 27 respondents did not participate actively.

3. Wife's Education. Thirty-five respondents had wives who completed high school or attended secretarial school and 60 respondents had wives who had gone to college.

4. Church Attendance. Thirty-one respondents reported weekly church attendance and 63 reported less frequent attendance or none at all.

Table 2. Phi coefficients showing the degree of relationship between three groups of dichotomized independent variables and the number of children, also dichotomized, for 95 married college graduates.

	Phi Coefficients
A. Independent Variables Indicating the Social Background of Respondent	
1. Type of Preparatory School	14
2. Occupation of Father	.02
3. Parents' Education	.00
4. Total Number of Siblings	.20ª
5. Number of Male Siblings	.16
6. Number of Female Siblings	.07
7. Religious Denomination	.21ª b
B. Independent Variables Indicative of the Respondent's Career in College	
1. Major Subject	.04 ^b
2. Extra-Curricular Activity	.01
3. Academic Standing	.13
C. Independent Variables Indicating the Respondent's Career Returnen Graduation in 1940 and 1955 Survey	
1 Joh Mobility	- 17
2. Civic Participation	16
3. Wife's Education	.11
4. Church Attendance	.20ª

• Coefficient is statistically significant at the 5 per cent level of probability, according to the chi-

square test. ^b The table on which this result is based had more than four cells. Consequently, the contingency coefficient, rather than the phi coefficient, was computed.

Table 2 shows the results of the analysis of the relationship between these variables and number of children, expressed in terms of phi coefficients.¹² Only three of the independent variables yield phi coefficients that are statistically significant. These are: religious denomination, church attendance, and total number of siblings. Catholics have the largest families, followed by Protestants and Jews, in that order. Those who attend church more regularly have more children. The greater the number of siblings in the family of orientation, the more children in the family of procreation.

The analysis of variance technique was used to compare six occupational groups in terms of fertility. These six groups were defined as follows:

1. Eighteen respondents who held positions in small to medium-sized family businesses which had been started by their fathers, uncles or grandfathers.

2. Thirteen respondents who ran small businesses which they had established themselves, either alone or in collaboration with one or more associates.

3. Seventeen respondents who were salaried professionals: engineers, journalists, editors, university, prep school or public high school teachers and administrators plus minor civil service officials.

4. Twelve respondents who were independent professionals: lawyers, physicians and accountants.

5. Twenty-one respondents who were executives in medium to large corporations, which were not family connected businesses, in the capacities of production manager, account executive (if the corporation was an advertising agency), personnel manager and so on.

6. Thirteen respondents who were salesmen in medium to large corporations, with which, again to the best of our knowledge, they had no family connections.

This occupational classification was developed on the basis of the data available about each member of the sample. Al-

¹² A good discussion of the virtues and also the limitations of the phi coefficient for expressing the relationships implicit in a four-cell table can be found in McNemar, Quinn: PSYCHOLOGICAL STATISTICS, New York, John Wiley, 1955, pp. 202–203.

though it thus has a certain specific focus, we believe it offers a promising start in dealing with the complex question of trying to find a classification of occupations which is adequate for dealing with college graduates, a group which is homogeneous in terms of the standard occupational scales used to study the national labor force. To put it in another way, we believe that the census classification of occupations in terms of "proprietors, managers and officials"; "professional and semi-professional workers"; etc. is not sufficiently refined for the men we studied. almost all of whom became either professional men or proprietors. Two factors underlie the classification used here: "opportunity for status allocation" and "total annual income." The first of these factors may be defined as the probability that a respondent's family of orientation is able to place him in an upper-class status. For instance, a graduate whose father owned a medium-sized business and who was therefore "guaranteed" a top position within its executive hierarchy would rank high in terms of "opportunity for status allocation." But a graduate who wanted to become a physician and whose father owned a small business would rank low in terms of this factor, since the father could not "guarantee" the son either admission to medical school or a successful practice.

The factor "total annual income" is self-explanatory. Relating the two factors to the six-fold classification above, we regard the respondents who hold positions in small to mediumsized family businesses as having the best "opportunity for status allocation" and "total annual income" probably somewhat above the average of the sample. The corporation executives, on the other hand, would rank considerably above the average in "total annual income" but their "opportunity for status allocation" would be less than the men who entered family businesses—assuming, as we do, that the executives obtained their jobs through their own efforts without the help of family connections. The salesmen, we suppose, are at the greatest disadvantage in terms of both factors, and this fact may go far in explaining their low fertility.

The mean number of children for each of these occupational groups was computed and the results are shown in Table 3. We find that those respondents who are members of family businesses which had been started by earlier generations and which, therefore, were "going concerns" when the respondents joined them, have the most children, an average of 3.00 per respondent. The group with the next highest fertility is that of the salaried professionals. In third position are the respondents who hold executive jobs in medium to large-sized corporations: they have 2.5 children. The independent professionals. including the physicians, have 2.17 children. Fifth position is held by the men who are members of small businesses which they themselves started. The salesmen have the lowest fertility. 1.77 children. The results are significant at the 5 per cent level of probability.

Correlation analysis was employed to study the degree of association between a battery of psychological rating scales and number of children, as well as between the number of months each respondent had been married at the time of 1955 survey and number of children. The following psychological rating scales constituted the independent variables in this analysis.

1. Modal Ratings in Behavior Description. This rating scale was developed by Bender as an adaptation of a similar

graduates.				
Occupational Group	N ^a	Mean Number of Children ^b		
Graduates in Small to Medium-Sized Family				
Businesses	18	3.00		
Salaried Professionals	17	2.71		
Executives in Medium to Large-Sized				
Corporations	21	2.52		
Independent Professionals	12	2.17		
Graduates in Small to Medium-Sized				
Businesses Started by Themselves	13	2.15		
Salesmen in Medium to Large-Sized				
Corporations	13	1.77		
-		1		

Table 3. Mean number of children by occupational group for 95 married male

One graduate, now retired, was not included in this particular analysis.
 F for this column is 3.06 which, with n equal to 5 and ng equal to 88 makes the results significant at approximately the 3 per cent level of probability.

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form published by the Reports and Records Committee of the Progressive Education Association.¹³ It provides ratings of the respondents in terms of these traits: responsibility-dependability; creativity; influence; open-mindedness; inquiring-mindedness; powers of analysis; seriousness of purpose; expressive quality; value energy; and work habits. The ratings, of course, refer to traits associated with performance in an educational setting. The students were rated by their instructors and by other educational personnel, such as deans and athletic coaches, during the course of their senior year in college. Each respondent was rated by an average of eight persons. Each trait was rated in terms of a five-point scale.

2. Allport-Bender Rating Scale for Traits of Personality. This was another rating scale, but one dealing with personality rather than behavior. The traits on which the respondents were rated in 1940 were these: practical intelligence; energy and purpose; emotional stability; ambition and dominance; attitude toward self; attitude toward others; and degree liked by others. Three series of ratings were obtained on each respondent: a self-rating; a rating by associates; and a rating by Bender.¹⁴

3. Allport-Vernon Study of Values. This famous test, which attempts to determine the relative importance which different kinds of values have for an individual, was given to the graduates in 1940 and to a smaller proportion of the total sample again in 1955. The values which the test attempts to measure are: theoretical, economic, aesthetic, social, political and religious.¹⁵

4. Rating on Introversion-Extroversion. A large proportion of the respondents were given Rorschach tests in 1940 and a rating for them in terms of an introversion scale based on their answers to the test was computed. In addition, Bender made his own rating of the degree to which the respondent was introverted or extroverted.

¹³ Bender, et al.: op. cit., pp. 23-24.
¹⁴ Ibid., pp. 24-25.
¹⁵ Ibid., p. 22.

Table 4. Pearson product-moment coefficients of correlation (r) showing the degree of association between number of children and selected independent variables for 95 married male graduates.

Independent Variable	R
 Modal Ratings in Behavior Description A. Responsibility and Dependability B. Creativity C. Influence D. Inquiring Mind E. Open Mind F. Power of Analysis G. Seriousness of Purpose H. Expressive Quality I. Value Energy J. Work Habits 	$ \begin{array}{r} .02 \\02 \\ .14 \\04 \\ .01 \\05 \\04 \\13 \\ .08 \\ .15 \\ \end{array} $
 Allport-Bender Rating Scale of Traits of Personality Self-Ratings	.13 17 12 .06 06 11
 B. Ratings by Associates Practical Intelligence Energy and Purpose Emotional Stability Ambition and Dominance Attitude toward Self Attitude toward Others Liked by Others C. Ratings by Bender Practical Intelligence Energy and Purpose Emotional Stability Ambition and Dominance 	$ \begin{array}{r} .21\\.07\\.09\\.29\\02\\.14\\.01\\\end{array} $
 5. Attitude toward Self 6. Attitude toward Others 7. Liked by Others 3. Allport-Vernon Study of Values A. Administered in 1940 1. Theoretical 2. Economic 3. Aesthetic 4. Social 5. Political 	.10 .07 .04 07 .10 02 .07 .02
 6. Religious B. Administered in 1955 Theoretical Economic Aesthetic Social Political Religious 4. Extroversion Score 	04 .05 .07 03 10 .19 12
1. Rorschach 2. Bender	.01 .48ª
5. Number of Months Married at Time of Survey in 1955	.27ª

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Table 4 gives the results of the various correlation analyses. Only two variables were found to be significantly related to the number of children of the respondents. One of these was the length of time the respondents had been married at the time of the survey in 1955, which showed an association of .2714 with fertility. The other variable was Bender's rating of the degree of extroversion, for which the correlation coefficient was .4815. The latter relationship is not so significant, in the statistical sense of this word, as might appear, since the score was available for only forty respondents.

Conclusion

On the basis of these data, what can we state are the sources of fertility differences among college graduates? Again, we wish to emphasize that our answer is subject to two qualifications. The study does not deal with completed fertility but with fertility fifteen years after graduation, which in the case of most respondents puts them in the age bracket 35 to 40. Second, the answer is given in terms of the data available to us, the nature and limitations of which should be fully clear to the reader by now.

The analysis of the data points to the influence of six factors on fertility. Catholics have more children than Protestants, and Protestants than Jews. The more regularly a graduate goes to church, the more likely he is to have a large family. (It is recognized that having a large family may encourage more frequent church attendance.) Graduates who have a greater number of brothers and sisters will themselves tend to have more children. Fertility varies significantly in terms of the following classification of occupations: men in family businesses; salaried professionals; executives in large corporations; independent professionals; men in businesses they started themselves; and salesmen. As might be expected, the longer a graduate has been married, the more likely it is that he will have a larger family. Finally, extroverts will have more children than introverts. All these relationships are statistically significant at the 5 per cent level of probability. Whether, in turn, some or all of these factors are so interrelated that they can be reduced to a smaller number of variables than six, or even to a single basic factor, is a matter which we hope to be able to consider in a later paper.

It is striking that the measures of psychological attributes show so little relationship to fertility, but how to interpret this fact poses a problem. Does it mean, for instance, that psychological differences among college men have relatively little impact on fertility? Or is the absence of positive results due to imperfections in the test materials available to us? In subsequent analysis of the data used in this study we hope to control the influence of some of the significant sociological variables; perhaps under those conditions some of the psychological factors will show significant association with fertility, in which case we will be in a better position to decide between the alternative explanations of this curious result.

SUMMARY

The present paper reports the results of a study of the fertility of a representative group of 95 married men who graduated from an eastern Ivy League college in 1940. Two questions have guided the study: what has been the range of variation in the fertility of the graduates to date; and what are the social and psychological factors associated with this variation?

In relation to the first question, it was found that fifteen years after leaving college, the members of the sample had an average of 2.43 children. Five men were childless and only one had as many as five offspring. If the respondents carry out their present fertility plans, they will average a little over three children per graduate. All the respondents expect to have children but few plan to have five children or more.

So far as the sources of variation in family size are concerned, six factors were shown to be positively and significantly associated with fertility. These factors were: broad religious group, church attendance, number of siblings, occupation, length of time married and degree of personality extroversion. With the exception of the extroversion score, none of the other psychological factors on which we had information were significantly related to number of children.

In a subsequent paper we hope to report on some attempts to refine the results of the present research.