SOCIAL AND PSYCHOLOGICAL FACTORS AFFECTING FERTILITY

XX. THE USE, EFFECTIVENESS, AND ACCEPTABILITY OF METHODS OF FERTILITY CONTROL[1]

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MANY observers of man's development through the ages have conceived his history as a series of trial and error attempts to control the external forces that affect him. In relatively recent times, this perspective has more and more emphasized the social and psychological, as well as the physical environment. An ever-increasing range of phenomena, heretofore accepted as "natural" processes not to be interfered with by man, have become subject to individual control. This process, which is familiar to the student of social change under the name of "secularization," has come to include even the control and determination of human reproduction—a subject which not too long ago was considered well outside the province of scientific inquiry. Nevertheless, it is a fact that human fertility is becoming increasingly a function of rational control, and that consequently the birth rates of many countries in Western civilization reflect in large measure the net result of a great number of conscious, deliberate choices between alternative courses of behavior.

This whole process of social change, which has been accelerated in this country in the last half century, has resulted in what is believed by many to be only a temporary pattern of large group differences in fertility. The strong inverse relation of fertility to such indices of socio-economic status as income, occupation, and education has been interpreted by

[1] This is the twentieth of a series of reports on a study conducted by the Committee on Social and Psychological Factors Affecting Fertility, sponsored by the Milbank Memorial Fund with grants from the Carnegie Corporation of New York. The Committee consists of Lowell J. Reed, Chairman; Daniel Katz; E. Lowell Kelly; Clyde V. Kiser; Frank Lorimer; Frank W. Notestein; Frederick Osborn; S. A. Switzer; Warren S. Thompson; and P. K. Whelpton.

most sociologists as a result of the uneven diffusion of birth control information through the various strata of society. It has been reasoned that as soon as this process of diffusion is complete the familiar inverse relationships will diminish substantially and may even be reversed. More precisely, the current theory as suggested by the evidence of the Indianapolis Study[2] and other research is that when the ratio of planned pregnancies to total pregnancies approaches unity, a *direct* relationship between socio-economic status and fertility will emerge; that is, couples will have the number of children they both desire and believe they can afford.[3]

If the theory of the unequal diffusion of birth control knowledge and practice is empirically valid, we should expect important class differences not only in the use of contraception *per se* but also in the relative effectiveness of the methods used. Furthermore, among those using the most effective methods we should probably further expect class differences in the proficiency of use. These and other basic questions, addressed both to a sample of the general population as well as to its class divisions, are examined in this analysis in the light of evidence collected in the Study of Social and Psychological Factors Affecting Fertility, known more briefly as the Indianapolis Study.

Other analyses of the Indianapolis Study data have explored the interrelations of many social and psychological variables with fertility-planning status. The classification system employed in this concept of "fertility-planning status"[4]

[2] *See especially* Kiser, Clyde V. and Whelpton, P. K.: Social and Psychological Factors Affecting Fertility. IX. Fertility Planning and Fertility Rates by Socio-Economic Status. The Milbank Memorial Fund *Quarterly,* April 1949, XXVII, No. 2, pp. 188–244 (Reprint pp. 359–414).

[3] *See* Kiser, Clyde V. and Whelpton, P. K.: Social and Psychological Factors Affecting Fertility. XI. The Interrelation of Fertility, Fertility Planning, and Feeling of Economic Security. The Milbank Memorial Fund *Quarterly,* January, 1951, XXIX, No. 1, pp. 41–122 (Reprint pp. 467–548).

For a more recent analysis of evidence pertinent to this trend cf. Kiser, Clyde V.: Fertility Trends and Differentials in the United States. *Journal of the American Statistical Association,* March, 1952, *47:* pp. 37–48.

[4] *See* Whelpton, P. K. and Kiser, Clyde V.: Social and Psychological Factors

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attempts to measure the relative degrees of planning success, that is, the extent to which couples had planned successfully both the number and the spacing of the children they wanted. As such, the resultant categories reflect the combined influences of complex differences in motivation which govern the regularity of contraceptive practice, and the choice and use of methods which vary in their degree of effectiveness. The present analysis does not endeavor to refine this classification scheme or to analyze further the motivational factors involved in fertility planning but rather, in addition to the above-mentioned objectives, purports to measure the observed effectiveness of the various contraceptive methods actually used. Other relevant research questions that are raised and partially answered in this report are: What are the sources of first information for couples about methods of contraception? From whom do they obtain their "most satisfactory" information? Why do couples use certain methods rather than others? Why do they find certain methods unsatisfactory and change to other methods? Are the most effective methods also the most acceptable methods?

The basic question of the effect on fertility of contraception in general has already been explored to some extent in previous articles of this series.[5] This entire subject of the effectiveness and acceptability of selected methods of contraception has also been probed at length in other studies.[6] To some extent the generalizations of these latter studies are limited by the

Affecting Fertility. VI. The Planning of Fertility. The Milbank Memorial Fund *Quarterly*, January, 1947, XXV, No. 1, pp. 63–111 (Reprint pp. 209–257).

[5] *See* Whelpton, P. K. and Kiser, Clyde V.: Social and Psychological Factors Affecting Fertility. VIII. The Comparative Influence on Fertility of Contraception and Impairments of Fecundity. The Milbank Memorial Fund *Quarterly*, April, 1948, XXVI, No. 2, pp. 182–236 (Reprint pp. 303–357).

[6] A few of the leading American studies in this field are those of Raymond Pearl, the results of which are summarized in his THE NATURAL HISTORY OF POPULATION. New York, Oxford University Press, 1939; Stix, Regine K. and Notestein, Frank W.: CONTROLLED FERTILITY. Baltimore, The Williams and Wilkins Company, 1940; and Beebe, Gilbert W.: CONTRACEPTION AND FERTILITY IN THE SOUTHERN APPALACHIANS. Baltimore, The Williams and Wilkins Company, 1942. For a basic bibliography on the subject, *see* Beebe, pp. 259–267. For a more specialized bibliography which concentrates more on the medical aspects of contraception *see* Dickinson, Robert L.: CONTROL OF CONCEPTION. Baltimore, The Williams and Wilkins Company, 1938 (Second Edition), pp. 353–370.

peculiarities of the populations to which they were restricted; for example, such admittedly unrepresentative groups as maternity patients and solicitors of aid from birth control clinics. To the growing literature in this field, the present analysis contributes an examination of the effectiveness and acceptability of many different methods of fertility control within a more "normal population."[7]

Data and Classifications

This analysis is based on the information supplied by 1,977 wives (the "inflated" sample) to detailed questions about their pregnancy and contraceptive histories ranging over a married period of 12 to 15 years. The various requirements that these couples had to meet for inclusion in the intensive interview study have been detailed in previous reports.[8] Briefly, the sample was restricted to couples who were native white, Protestant, at least eighth grade graduates, married during 1927–1929, never previously married, residents of a large city most of the time since marriage, and with the husband under 40 and the wife under 30 at marriage.

Most of the previous articles in this series have analyzed various relationships in terms of numerous characteristics exhibited either by the couples or by the wives or husbands treated separately. Since the major part of the present analysis departs from this procedure and subdivides the experience of individual couples according to types of contraceptive and noncontraceptive *exposure*, and uses months or years rather than couples as discrete statistical units,[9] it will be helpful at

[7] For a detailed discussion of the sampling *see* Whelpton, P. K. and Kiser, Clyde V.: Social and Psychological Factors Affecting Fertility. v. The Sampling Plan, Selection, and Representativeness of Couples in the Inflated Sample. The Milbank Memorial Fund *Quarterly*, January, 1946, xxiv, No. 1, pp. 49–93 (Reprint pp. 163–207).

[8] For a complete description of these eligibility requirements and their rationale *see* Whelpton, P. K. and Kiser, Clyde V.: Social and Psychological Factors Affecting Fertility. iv. Developing the Schedules, and Choosing the Type of Couples and the Area to be Studied. The Milbank Memorial Fund *Quarterly*, October, 1945, xxiii, No. 4, pp. 386–409 (Reprint pp. 139–162).

[9] The basic assumption of statistical independence involved here is that of "in-

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this point to list and define formally the various technical terms which are employed.

"Relatively Fecund" Couples. These are couples who reported at least four live births, and all other couples with three or fewer live births unless they knew or had good reason for believing that conception was physiologically impossible during a period of at least twenty-four or thirty-six consecutive months since marriage (twenty-four for never-pregnant couples, thirty-six for others). Failure to conceive during periods of this duration when contraception was not practiced "always" or "usually" was considered good reason for such belief. Of the total 1,977 couples, 1,444 were classified as "relatively fecund."

"Relatively Sterile" Couples. The remaining 533 couples were classified as "relatively sterile." It is well to bear in mind that these classifications of fecundity status were neither de-

dependent" monthly ovulations. The theoretical implications and limitations of this assumption, particularly as related to the logic of tests of significance, are discussed fully in Beebe, *op. cit.*, pp. 227–239. Despite the absence of complete aggrement and final judgment on the justifications of this assumption, operational decisions have to be made. The problem forces itself upon the attention of the investigator at the outset in the question of what constitutes a reliable pregnancy rate. Previous investigators have computed pregnancy rates with denominators as low as 10 exposure years (Stix and Notestein, *op. cit.*). Another (Beebe, *op. cit.*) decided in favor of 500 exposure months (slightly over 40 years). The authors of the present study decided that 10 exposure-years is much too low since it is quite possible for this number of years to represent the experience of only one couple. It was felt that computing a rate for even as impressive a figure as 120 months of exposure is quite presumptuous if this aggregate represents the experience of only one couple. Information about exposure time only is insufficient unless the number of years is so high as to insure automatically a minimum number of couples. To establish a certain criterion based on number of couples alone is therefore necessary but still insufficient. In addition, there must be some assurance that these couples as a group have had an "adequate" period of exposure with, for example, a certain method of contraception. (This consideration applies only to pregnancy rates during periods of contraceptive exposure.) This lends confidence to an interpretation of a rate in terms of the protection afforded by the method rather than chance variation resulting from insufficient exposure. It was decided, therefore, that in order to have a minimum sampling reliability and statistical stability for the rate, it is necessary to incorporate both considerations—number of couples and length of exposure—into the criteria for the computation of a rate. These minimal requirements were defined arbitrarily at twenty couples and 50 exposure years for exposure during which time contraception was practiced. It is recognized that these precautions do not fully guarantee that each of the couples has had a sufficient amount of exposure for the evaluation of the effectiveness of a given method. The single criterion of twenty couples was maintained for pregnancy rates computed for periods of noncontraceptive exposure.

termined medically nor designed to conform strictly to medical concepts of fecundity and sterility.

Exposure. This term is used to indicate the periods of time during which conception might have occurred. The number of months of such exposure was computed by subtracting from the total months of married life the months pregnant (and an additional one month per pregnancy for the puerperium),[10] months sterile, months physically separated (if two or more months at a time) when neither pregnant nor sterile, and months when coitus was impossible for anatomical reasons. Separations included periods of two months or more during which the husband or wife was in a hospital.

For purposes of analysis, exposure to the risk of conception was divided into noncontraceptive and contraceptive exposure with various subclassifications.

Noncontraceptive Exposure:

A. Before Contraception Began. This category includes only exposure during the period preceding the first use of contraception. In other words, a married couple so classified had never had any contraceptive experience preceding this type of exposure. Other types of noncontraceptive exposure are accounted for in the following categories.

B. Stopped Contraception to Conceive. This includes all exposure of couples between the time they interrupted contraception in order to have a child and the time of conception or, with a few couples, until the time when they were interviewed or when they resumed contraception.

C. Stopped Contraception, Other. This denotes the small proportion of noncontraceptive exposure following the interruption of contraception for reasons other than a desire to conceive, e.g., the supply of contraceptive materials was temporarily ex-

[10] It is realized that there is some disagreement about the period of time that should be discounted for the puerperium. A recent study, for example, has allowed three months after each birth. *See* PAPERS OF THE ROYAL COMMISSION ON POPULATION, VOL. I. FAMILY LIMITATION. London, His Majesty's Stationery Office, 1949, p. 109. This entire subject of the chance of conception in each postpartum month requires intensive research.

hausted, health reasons, no money to buy contraceptives, and religious objections.

Contraceptive Exposure:

A. Practiced Contraception "Always." Includes all exposure when contraception was practiced with no omissions or with rare omissions (not more than three or four times a year or 3 or 4 per cent of the time it was practiced).

B. Practiced Contraception "Usually." Differs from "always" in that omissions occurred more frequently but less than one-fourth to one-third of the times when coitus took place.

C. Practiced Contraception "Sometimes." Denotes all contraceptive exposure during which time contraception was omitted more than in the preceding classification but was not discontinued entirely.

All pregnancies occurring to the entire group studied were assigned to the appropriate exposure classification.

Periods "Definitely Sterile." This category is not considered "exposure" in the above sense of the term since by definition it is restricted to periods when conception was considered physiologically impossible for such reasons as a hysterectomy, a vasectomy, or a physician's statement (with or without reason) to the effect that the couple was incapable of conceiving. It was assumed that a period of "definite sterility" could be followed by a period of normal fecundity only as a result of surgery.

Contraceptive Methods. A total of twenty-two methods of contraception were coded for use in this study.[11] Although other methods were used, these twenty-two constitute the most frequently employed techniques. Eleven of the methods consist of one contraceptive (or procedure) used singly,[12] seven of two or more used in combination, and four of two or more used alternately.[13]

[11] The list appears recurrently in various tables throughout the text.

[12] "Diaphragm and Jelly" is classified here as a single method.

[13] Periods when douche was reported to be used "for cleanliness only" are regarded for some purposes as contraceptive exposure and for others are omitted from

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Income Classifications. The measure of income used is the average annual earnings of husband and wife combined since marriage. The categories defined as high, medium, and low correspond to average annual incomes of $2,400 and over, $1,600 to 2,399, and under $1,600, respectively. For various reasons, involving noncomparability of data, the "relatively fecund" and "relatively sterile" couples have not been combined in the income classifications.[14]

Measure of Risk of Conception. The measure of chance of conception used in this study is the pregnancy rate which is defined as the number of pregnancies per 100 years of exposure. It was obtained by dividing the number of conceptions actually occurring by the number of months of exposure as defined above and multiplying by 1,200 in order to avoid unwieldy decimals. As explained in footnote 9, the minimal criterion adopted for the computation of this rate was 20 couples and 50 years of exposure.

Reversing this computation procedure and dividing the number of months of exposure by the number of conceptions results in the average number of exposure-months per conception. This average is employed in conjunction with the pregnancy rate in the analysis that follows.

the analysis. In the tables that follow these periods will be considered as contraceptive exposure unless otherwise noted. The general rule followed is to regard this exposure as contraceptive when the respondent's "performance" is being considered and as noncontraceptive when attention is focused on the respondent's "motive." Lactation, in this particular analysis, is not defined as a method of contraception.

[14] The authors feel that the income data are not comparable for the two groups. For the "relatively fecund" couples the average incomes were computed from a detailed income history while the "relatively sterile" couples were asked simply to estimate their average annual income since marriage. It was felt that the answers to this single question probably were biased in favor of the years immediately preceding the interview and would not be likely to include all periods of unemployment, and hence gave less accurate results than the more extensive data available for the "relatively fecund" couples. The presumed unreliability of these data for the "relatively sterile" couples implies so many limitations on interpretation that it was decided to restrict income analysis primarily to the "relatively fecund" couples.

The inclusion of the wife's income in the data for "relatively fecund" couples results in a shift of one position (either from medium to high or from low to medium) for slightly under 20 per cent of the couples. In other words, over 80 per cent of the couples would be classified in the same group if the definition of income included only husband's average annual earnings since marriage. Nevertheless, the fact of wife's employment does have decided implications in reproductive behavior which are unaccounted for in this study.

The concept and derivation of the *Effectiveness Ratio,* which is also employed extensively in this study, is explained in a later section.

Exposure and Pregnancies With and Without Contraception

In most of the analysis that follows, a distinction is maintained between the experience before and after the first pregnancy. The reason for this is the anovulatory nature of certain months following childbirth. Exposure before the first pregnancy is by definition free of puerperal amenorrhea, lactation, and the more obscure processes which attend the recuperation and reorganization of the reproductive system following childbirth.[15] During periods of postpartum exposure the chance of conception is greatly reduced.[16] In addition to these considerations of a physiological nature, there is the reasonable expectation that proficiency in the use of contraception would improve after the first pregnancy[17] because of a desire to space births properly, and also, if the first pregnancy was not wanted, because of an increased determination to prevent additional unwanted pregnancies. The importance of these combined influences, as reflected in lower pregnancy rates for exposure after the first pregnancy, is evidenced in many of the tables which appear in this study (Table 3 provides the first opportunity for this comparison). Sections of tables including data on "all pregnancies" are presented simply for summary purposes and are not intended to divert attention from the more refined analysis which takes into account the above differences.

The relation of the different types of exposure to income is presented in Table 1 and Figure 1. The first noteworthy fea-

[15] Months of lactation are taken into account in a later section.

[16] *Cf.* Beebe, *op. cit.,* p. 76. Beebe reports a noncontraceptive pregnancy rate of 105 for exposure outside of coincident amenorrhea and lactation in contrast to a rate of only 3 during such periods.

[17] The "before first pregnancy" and "after first pregnancy" categories are not strictly comparable in another sense in that all of the same couples are not found in both groups. The main source of difference lies in the exclusion from the "after first pregnancy" group of the childless couples and the couples who were pregnant for the first time at interview.

Type of Exposure	"Relatively Fecund"				"Relatively Sterile"	All Couples
	Income of Couple					
	High	Medium	Low	Total		
	ALL EXPOSURE					
Number of Exposure Years	2,976	5,383	5,057	13,416	4,776	18,192
Per Cent:						
Total	100.0	100.0	100.0	100.0	100.0	100.0
Contraception Used, Total	*94.7*	*95.8*	*93.2*	*94.6*	*36.7*	*79.5*
"Always"	90.9	89.6	85.4	88.4	27.4	72.4
"Usually" or "Sometimes"	3.8	6.2	7.8	6.2	9.3	7.1
No Contraception Used, Total	*5.3*	*4.2*	*6.8*	*5.4*	*63.3*	*20.5*
"Before Contraception Began"	0.8	1.9	5.0	2.8	36.5	11.6
"Stopped Contraception to Conceive"	4.2	2.1	1.3	2.3	20.4	7.0
"Stopped Contraception, Other"	0.3	0.2	0.5	0.3	6.4	1.9
	BEFORE FIRST PREGNANCY					
Number of Exposure Years	1,277	1,581	800	3,658	2,828	6,486
Per Cent:						
Total	100.0	100.0	100.0	100.0	100.0	100.0
Contraception Used, Total	*94.9*	*92.3*	*84.0*	*91.4*	*27.1*	*63.4*
"Always"	90.5	84.1	73.4	84.0	19.5	55.9
"Usually" or "Sometimes"	4.4	8.2	10.6	7.4	7.6	7.5
No Contraception Used, Total	*5.1*	*7.7*	*16.0*	*8.6*	*72.9*	*36.6*
"Before Contraception Began"	1.1	4.6	13.0	5.2	44.7	22.4
"Stopped Contraception to Conceive"	4.0	2.8	2.8	3.2	22.9	11.8
"Stopped Contraception, Other"	0.0	0.3	0.2	0.2	5.3	2.4
	AFTER FIRST PREGNANCY					
Number of Exposure Years	1,699	3,802	4,257	9,758	1,948	11,706
Per Cent:						
Total	100.0	100.0	100.0	100.0	100.0	100.0
Contraception Used, Total	*94.7*	*97.3*	*94.9*	*95.8*	*50.6*	*88.3*
"Always"	91.3	92.0	87.7	90.0	38.8	81.5
"Usually" or "Sometimes"	3.4	5.3	7.2	5.8	11.8	6.8
No Contraception Used, Total	*5.3*	*2.7*	*5.1*	*4.2*	*49.4*	*11.7*
"Before Contraception Began"	0.5	0.8	3.5	1.9	24.6	5.7
"Stopped Contraception to Conceive"	4.3	1.7	1.0	1.9	16.7	4.3
"Stopped Contraception, Other"	0.5	0.2	0.6	0.4	8.1	1.7

Table 1. Proportion of exposure with and without contraception, for "relatively fecund" couples by income, and for "relatively sterile" couples and all couples.

ture of the data for "relatively fecund" couples is the lack of any substantial relationship between income and the proportion of exposure with contraception.[18] The only instance of a

[18] Some fragmentary evidence was obtained which suggested that this statement is not true for the "relatively sterile" couples. On the contrary, the statistical rela-

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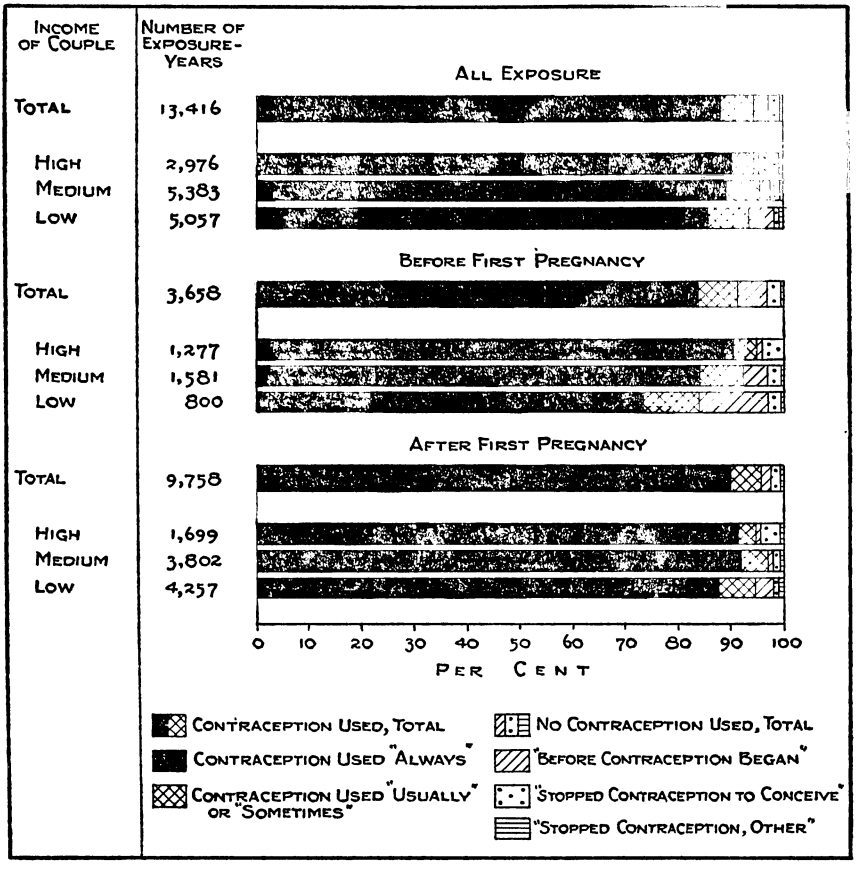

Fig. 1. Type of exposure to the risk of pregnancy for "relatively fecund" couples by income.

clear-cut relationship is found in exposure before the first pregnancy[19] where the proportion of total exposure with contraception is 95 and 84 per cent for the "high" and "low"-income

tionships obtained indicate an irregular inverse relation of contraceptive exposure to income but are consistent with the pattern for the "relatively fecund" couples in retaining a direct association of income with noncontraceptive exposure following the interruption of contraception in order to conceive. These data are not presented here because of the aforementioned difficulties in classifying these couples by income (*see* footnote 14). It is hoped that the first-mentioned author of this study will be able to explore this entire subject of sterility and socio-economic status in a future study. Some preliminary conferences have already produced agreement that this problem and an analysis of noncontraceptive fertility both deserve much more attention than can be given to them here.

[19] It is quite possible that greater differences may have been discovered if the sample had not been so homogeneous, that is, restricted to native-white, urban couples of at least eighth grade education.

groups, respectively. In addition, there is a small but important class difference in the regularity of use of contraception. This difference is also more sharply pronounced for exposure before the first pregnancy with 91 per cent of the exposure of the "high" income class manifesting the use of contraception "always" in contrast to only 73 per cent for the "low" income class. Although the total *noncontraceptive* exposure of the income groups shows no definite pattern (except in exposure before the first pregnancy) the subdivision of this exposure into two quite different types of noncontraceptive exposure reveals consistent class differences in the extent to which family size is planned, that is, a direct relationship between income and exposure when contraception was interrupted in order to conceive. That contraception is adopted earlier in marriage by couples in higher-income brackets is indicated by the fact that only 1 per cent of the total exposure of the "high" income group before the first pregnancy occurred "before contraception began" as opposed to 13 per cent for the "low" income group.

The use of contraception increases after the first pregnancy for all income groups, except for the "high" class where it remains at the same high level (95 per cent). This increase is due to several factors, one of them being the gain in knowledge of contraception which frequently accompanies obstetrical service. The primary reason, however, is probably an intensified determination to control reproduction. Fully 40 per cent of all first pregnancies of the "relatively fecund" group were definitely accidental, i.e., occurred while contraception was being practiced. An additional 30 per cent were "unplanned" in another sense, since they occurred before contraception began[20] (*see* Table 2).

The contraceptive practice of the "relatively sterile" couples increases even more, from 27 per cent of all exposure before the first pregnancy to 51 per cent after this event. The ratio

[20] For an elaboration of the fertility-planning classifications, *see* Whelpton and Kiser, *op. cit.*, VI. The Planning of Fertility, pp. 74–85 (Reprint pp. 220–231).

Type of Exposure	"Relatively Fecund" Income of Couple				"Relatively Sterile"	All Couples
	High	Medium	Low	Total		
	ALL PREGNANCIES					
Number of Pregnancies	541	1,027	1,414	2,982	570	3,552
Per Cent:						
Total	100.0	100.0	100.0	100.0	100.0	100.0
Contraception Used, Total	*41.8*	*49.3*	*59.1*	*52.6*	*30.0*	*48.9*
"Always"	32.4	37.3	45.9	40.5	15.4	36.4
"Usually" or "Sometimes"	9.4	12.0	13.2	12.1	14.6	12.5
No Contraception Used, Total	*58.2*	*50.7*	*40.9*	*47.4*	*70.0*	*51.1*
"Before Contraception Began"	7.4	16.8	24.6	18.8	41.6	22.5
"Stopped Contraception to Conceive"	49.9	32.7	14.1	27.0	24.6	26.6
"Stopped Contraception, Other"	0.9	1.2	2.2	1.6	3.8	2.0
	FIRST PREGNANCIES					
Number of Pregnancies	263	491	501	1,255	326	1,581
Per Cent:						
Total	100.0	100.0	100.0	100.0	100.0	100.0
Contraception Used, Total	*39.5*	*38.5*	*41.9*	*40.1*	*25.5*	*37.1*
"Always"	28.5	26.9	30.1	28.5	15.4	25.8
"Usually" or "Sometimes"	11.0	11.6	11.8	11.6	10.1	11.3
No Contraception Used, Total	*60.5*	*61.5*	*58.1*	*59.9*	*74.5*	*62.9*
"Before Contraception Began"	10.3	26.9	42.7	29.7	46.6	33.2
"Stopped Contraception to Conceive"	49.4	33.8	14.6	29.4	24.5	28.4
"Stopped Contraception, Other"	0.8	0.8	0.8	0.8	3.4	1.3
	LATER PREGNANCIES					
Number of Pregnancies	278	536	913	1,727	244	1,971
Per Cent:						
Total	100.0	100.0	100.0	100.0	100.0	100.0
Contraception Used, Total	*43.9*	*59.1*	*68.4*	*61.6*	*36.1*	*58.4*
"Always"	36.0	46.8	54.5	49.2	15.6	45.0
"Usually" or "Sometimes"	7.9	12.3	13.9	12.4	20.5	13.4
No Contraception Used, Total	*56.1*	*40.9*	*31.6*	*38.4*	*63.9*	*41.6*
"Before Contraception Began"	4.7	7.7	14.7	10.9	34.8	13.9
"Stopped Contraception to Conceive"	50.3	31.7	13.9	25.3	24.6	25.2
"Stopped Contraception, Other"	1.1	1.5	3.0	2.2	4.5	2.5

Table 2. Proportion of conceptions occurring with and without contraception, for "relatively fecund" couples by income, and for "relatively sterile" couples and all couples.

of contraceptive to noncontraceptive exposure for the "relatively sterile" couples differs significantly from that of the "relatively fecund" couples. During only 37 per cent of all exposure did the "relatively sterile" couples use contraception

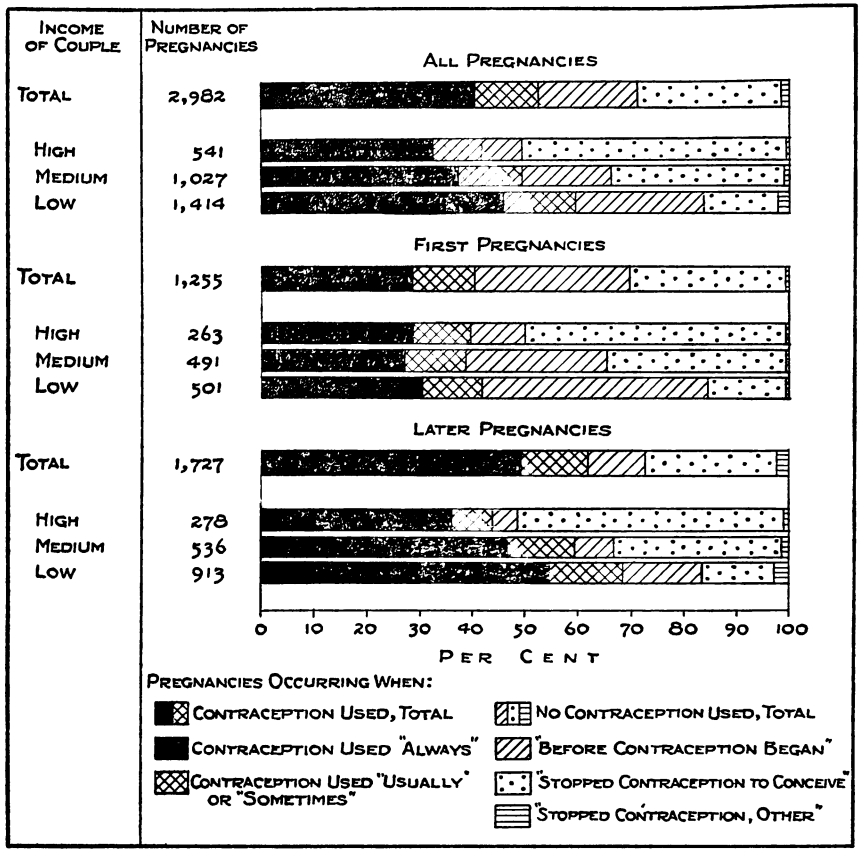

Fig. 2. Proportion of pregnancies occurring by type of exposure for "relatively fecund" couples by income.

as compared to 95 per cent for the "relatively fecund" group. This wide discrepancy can best be understood when we consider that for many of the couples classified as "relatively sterile" the main problem was to have a child, whereas for many of the "relatively fecund" couples[21] it was to prevent or control conception.

The proportion of pregnancies that occurred during these different types of exposure is presented in Table 2 and Figure 2. A striking feature of this tabulation is the fact that over half (53 per cent) of all the conceptions experienced by the "rela-

[21] *Cf.* Kiser and Whelpton, *op. cit.*, IX. Fertility Planning and Fertility Rates by Socio-Economic Status, p. 209 (Reprint p. 380).

tively fecund" couples occurred during periods when contraception was being practiced and over 40 per cent occurred while contraception was being practiced "always." It must be remembered, of course, that 95 per cent of all exposure was with contraception, and that the *rate* of conception during exposure with contraception is only *one-sixteenth* of the rate without contraception (*see* Table 3). Nevertheless, this high proportion of accidental pregnancies certainly indicates in part

Table 3. Pregnancies per 100 years exposure, for "relatively fecund" couples by income, and for "relatively sterile" couples and all couples.

Type of Exposure	"Relatively Fecund"				"Relatively Sterile"	All Couples
	Income of Couple					
	High	Medium	Low	Total		
	ALL PREGNANCIES					
All Exposure	18	19	28	22	12	20
Contraception Used, Total	*8*	*10*	*18*	*12*	*10*	*12*
"Always"	6	8	15	10	7	10
"Usually" or "Sometimes"	45	37	48	43	19	35
No Contraception Used, Total	*202*	*233*	*168*	*195*	*13*	*48*
"Before Contraception Began"	171	170	138	149	14	38
"Stopped Contraception to Conceive"	218	302	298	267	14	74
"Stopped Contraception, Other"	*	*	119	105	7	20
	FIRST PREGNANCY					
All Exposure	21	31	63	34	12	24
Contraception Used, Total	*9*	*13*	*31*	*15*	*11*	*14*
"Always"	6	10	26	12	9	11
"Usually" or "Sometimes"	52	44	69	54	15	37
No Contraception Used, Total	*244*	*249*	*228*	*240*	*12*	*42*
"Before Contraception Began"	188	181	206	195	12	36
"Stopped Contraception to Conceive"	258	375	320	314	12	59
"Stopped Contraception, Other"	*	*	*	*	7	14
	AFTER FIRST PREGNANCY					
All Exposure	16	14	21	18	13	17
Contraception Used, Total	*8*	*9*	*16*	*11*	*9*	*11*
"Always"	6	7	13	10	5	9
"Usually" or "Sometimes"	38	33	42	38	22	33
No Contraception Used, Total	*172*	*214*	*133*	*161*	*16*	*60*
"Before Contraception Began"	*	142	91	101	18	41
"Stopped Contraception to Conceive"	191	253	286	236	18	98
"Stopped Contraception, Other"	*	*	109	95	7	25

* Rates not computed for base of less than twenty couples.

the extent to which contraception as practiced was not as effective as desired.

The relationships of primary concern in this analysis are shown more satisfactorily in Table 3 where exposure and conceptions can be considered jointly in the form of pregnancy rates, and in Table 4 (Figures 3 and 4) where the data are presented in terms of average number of exposure-months per

Table 4. Mean number of exposure-months per conception for periods when no contraception was practiced, for "relatively fecund" couples by income, and for "relatively sterile" couples and all couples.

Type of Exposure	"Relatively Fecund"				"Relatively Sterile"	All Couples
	Income of Couple					
	High	Medium	Low	Total		
	ALL PREGNANCIES					
All Exposure	66	63	43	54	101	61
Contraception Used, Total	150	122	68	97	123	100
"Always"	186	151	80	118	178	122
"Usually" or "Sometimes"	27	32	25	28	64	35
No Contraception Used, Total	6	5	7	6	91	25
"Before Contraception Began"	7	7	9	8	88	32
"Stopped Contraception to Conceive"	6	4	4	5	83	16
"Stopped Contraception, Other"	*	*	10	11	168	60
	FIRST PREGNANCY					
All Exposure	58	39	19	35	104	49
Contraception Used, Total	140	93	38	80	111	84
"Always"	185	121	47	103	133	107
"Usually" or "Sometimes"	23	27	17	22	78	33
No Contraception Used, Total	5	5	5	5	102	29
"Before Contraception Began"	6	7	6	6	100	33
"Stopped Contraception to Conceive"	5	3	4	4	97	20
"Stopped Contraception, Other"	*	*	*	*	162	88
	AFTER FIRST PREGNANCY					
All Exposure	73	85	56	68	96	71
Contraception Used, Total	158	140	78	105	134	108
"Always"	186	167	90	124	239	129
"Usually" or "Sometimes"	32	37	29	32	55	36
No Contraception Used, Total	7	6	9	7	74	20
"Before Contraception Began"	*	8	13	12	68	29
"Stopped Contraception to Conceive"	6	5	4	5	65	12
"Stopped Contraception, Other"	*	*	11	13	173	49

* Averages not computed for less than twenty couples.

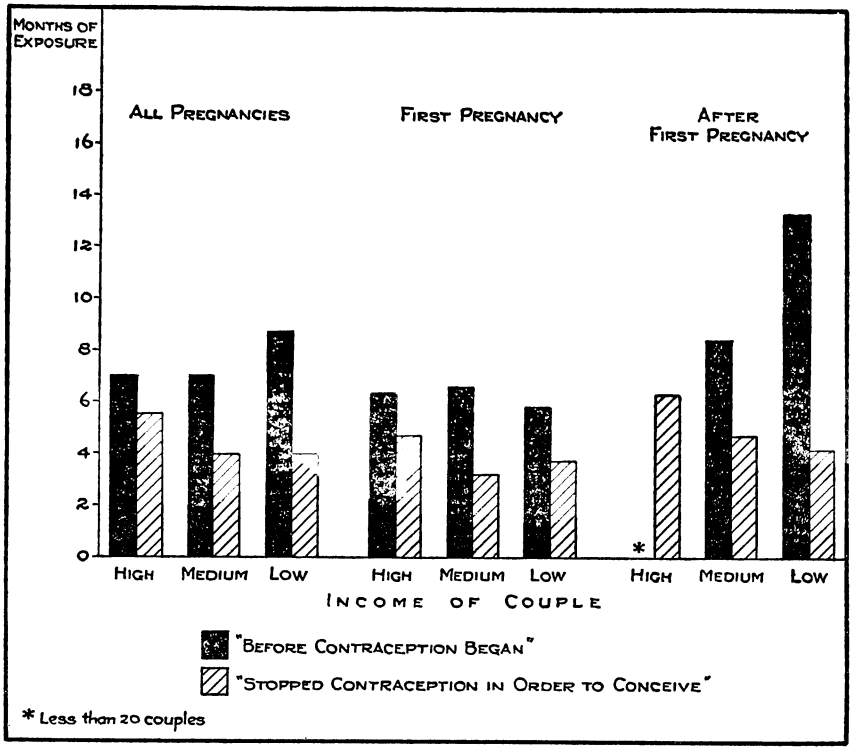

Fig. 3. Mean number of exposure-months per conception for periods when no contraception was practiced, for "relatively fecund" couples by income.

conception. A consistent pattern which can be discerned in these and similar data in other studies is the higher pregnancy rate for exposure while contraception was interrupted in order to conceive as compared to the rates for noncontraceptive exposure before contraception began. The pregnancy rates for the two types of exposure for "relatively fecund" couples are, respectively, 314 and 195 for the first pregnancy and 236 and 101 for all later pregnancies. The two types of exposure are the same in the sense that both are experienced without contraception. Why there should be such consistent differences in these pregnancy rates has not been explained completely. The consensus seems to be that part of the difference in the two rates for conceptions *after* the first pregnancy can be attributed to the probability that the planned pregnancy type of exposure favors quick conception in that, unlike exposure after the first

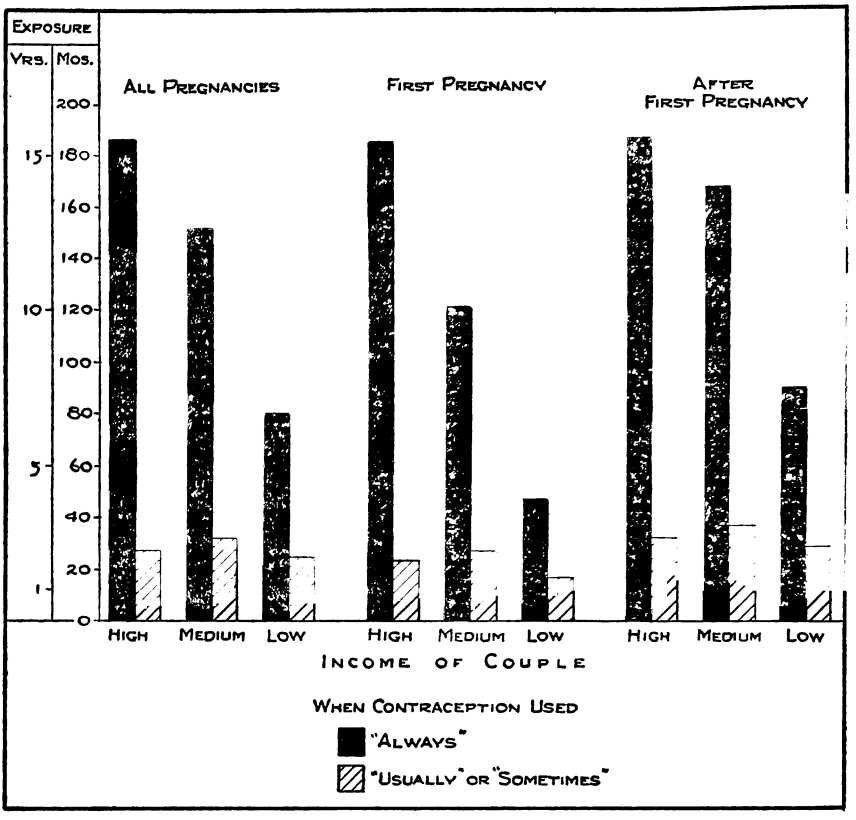

Fig. 4. Mean number of exposure-months per conception for periods when contraception was practiced, for "relatively fecund" couples by income.

pregnancy prior to the first use of contraception, it contains no periods of protective amenorrhea or lactation.[22] The difference between these two rates for first pregnancies is less easily explained. A good part of the explanation may involve a tendency for couples to underestimate, in retrospect, the time it took to conceive after interrupting contraception for this purpose. A more active sex life during these periods has been suggested by some[23] but it seems doubtful that couples will reach any higher level than those using no contraception just after marriage. Another hypothesis is that couples who stop

[22] Stix and Notestein, *op. cit.*, p. 68; Beebe, *op. cit.*, p. 65; and Whelpton and Kiser, *op. cit.*, VI. The Planning of Fertility, p. 99 (Reprint p. 245).

[23] Beebe, *op. cit.*, p. 65; PAPERS OF THE ROYAL COMMISSION ON POPULATION, *op. cit.*, VOL. I. FAMILY LIMITATION, p. 115.

contraception in order to conceive may plan consciously to have intercourse during that period of the menstrual cycle most favorable for conception.[24] While this may be a plausible explanation for some groups it appears untenable for the couples in this study. In this group during the years under observation (1927–1941), the relation between time of menstruation and ovulation was not widely known, and the days in the *middle* of the menstrual cycle were commonly considered the "safest." Other explanations that have been offered are: (a) women who plan their conceptions are usually at the age and in a condition of health most favorable for conception;[25] and (b) a period when the degree of entrance is not complete is much more likely to delay conception when couples use no contraception in the months immediately following marriage than when they stop contraception at a later time.[26]

In any event, the evidence appears to indicate clearly that the use of contraception does not in the least reduce the fecundity of the user.[27]

It is apparent in Table 3 that although there are large and statistically significant[28] variations in the noncontraceptive pregnancy rates by income, there is no discernible systematic pattern of association.[29] This apparent lack of relationship plus the similar findings of other analyses of noncontraceptive

[24] Beebe, *op. cit.*, p. 65.

[25] *Ibid.*

[26] Stix and Notestein, *op. cit.*, p. 70; Whelpton and Kiser, *op. cit.*, VI. The Planning of Fertility, p. 99 (Reprint p. 245).

[27] *Cf.* Stix and Notestein, *op. cit.*, p. 70.

[28] The differences among the rates for the three income classes for the "No Contraception Used, Total" and the "Stopped Contraception to Conceive" exposure are statistically significant at the 1 per cent level of probability. For the "Before Contraception Began" exposure for the first pregnancy the differences are not statistically significant but for "after the first pregnancy" they are significant between the 1 per cent and 2 per cent probability levels and for all pregnancies are significant between the 2 per cent and 5 per cent levels.

[29] As indicated in footnote 18, a more detailed study concentrating entirely on noncontraceptive fertility is being considered. For an analysis of the effect of certain physiological phenomena on variations in noncontraceptive fertility *see* Stix, Regine K.: Factors Underlying Individual and Group Differences in Uncontrolled Fertility. The Milbank Memorial Fund *Quarterly*, July, 1940, xviii, No. 3, pp. 239–256.

fertility[30] reaffirms the assumption of the absence of systematic class differences in fecundity. The differences in pregnancy rates by income which appear for "all exposure," therefore, must be attributed to differences in the extent and effectiveness of contraceptive practices. More specifically, the variation is associated primarily with class differences in the effectiveness of contraception when it is practiced "always." In other words, regularity of use is less important than proficiency of use as an explanation of class differences in conception rates among these Indianapolis couples. To this question of differences in proficiency of use must be added the related and equally important question of whether there are class differentials in the use of *methods* of contraception which themselves vary in effectiveness.

Income-Class Differences in the Methods of Contraception Used

Although twenty-two methods have been coded for analysis in this study, attention will be directed primarily at the more common single methods—the various douches, condom, withdrawal, diaphragm and jelly, suppository, jelly—and only occasionally at others. Although a few of the remaining methods are used more frequently than some of these, the fact that they are used either in combination or alternately with other methods increases the difficulty of interpretation.[31]

The methods used by the largest proportions of couples are: condom; water, Lysol, and "other" douches; and diaphragm and jelly (*see* Tables 5 and 6). The extent to which condom was used as a single method (28 per cent of all couples having used condom by itself) agrees well with findings of previous

[30] Various studies have revealed absences of systematic group differences in fecundity, whether defined in economic, religious, racial, or occupational terms. "Fecundity" has been inferred from noncontraceptive pregnancy rates.

See Stix and Notestein, *op. cit.*, pp. 39–41; Beebe, *op. cit.*, pp. 80–84; Papers of the Royal Commission on Population, *op. cit.*, Vol. I. Family Limitation, pp. 128–129; Pearl, *op. cit.*, pp. 25–26; Stix, Regine K.: Birth Control in a Midwestern City. I. Contraception and Fertility Before Clinic Attendance. The Milbank Memorial Fund *Quarterly*, January, 1939, xvii, No. 1, pp. 79–81 (Reprint pp. 79–81).

[31] This difficulty is, of course, greatest when the questions of effectiveness and acceptability are raised. Nevertheless, data on all twenty-two methods will be presented when feasible in the tables that follow.

Method of Contraception	"Relatively Fecund"				"Relatively Sterile"	All Couples
	Income of Couple					
	High	Medium	Low	Total		
Total Number of Couples	329	569	543	1,444	533	1,974
Number Practicing Contraception at Any Time	329	569	537	1,435[1]	370	1,805
Number Never Practicing Contraception	—	—	6	6	163	169
Per Cent of Couples Practicing Contraception Who Used the Following Methods:[2]						
Douche, Water	12.2	12.1	17.1	14.0	20.5	15.3
Douche, Lysol	9.1	14.9	19.0	15.1	10.5	14.2
Douche, Salt and/or Soda	3.3	4.6	9.1	6.0	7.0	6.2
Douche, Zonite	6.1	4.4	0.7	3.4	2.4	3.2
Douche, Other[3]	13.7	15.5	19.2	16.4	21.9	17.6
Condom	29.2	31.3	25.7	28.7	23.0	27.5
Withdrawal	5.8	4.7	8.4	6.3	5.1	6.1
Diaphragm and Jelly[4]	17.3	12.8	16.6	15.3	4.3	13.0
Suppository	3.3	6.7	13.0	8.3	7.0	8.0
Jelly[5]	4.9	2.3	1.1	2.4	2.2	2.4
Safe Period	2.7	1.8	2.4	2.2	2.2	2.2
Condom and Water Douche	6.7	6.2	5.8	6.1	2.7	5.4
Condom and Lysol Douche	4.0	3.7	1.7	3.0	0.3	2.4
Condom and Other Douche[3]	4.6	6.5	3.5	4.9	2.7	4.5
Withdrawal and Douche[6]	2.7	3.2	3.9	3.3	1.9	3.0
Diaphragm, Jelly, and Douche[7]	1.2	2.3	1.7	1.8	0.0	1.4
Suppository and Douche[6]	2.1	6.3	4.8	4.8	2.2	4.3
Safe Period and Douche[6]	1.5	1.6	1.3	1.5	0.5	1.3
Condom or Douche[6]	8.5	7.2	10.4	8.7	2.4	7.4
Condom or Douche, or Condom and Douche[8]	2.7	4.0	6.0	4.5	3.0	4.2
Condom or Withdrawal	4.3	3.7	5.6	4.5	0.5	3.7
Withdrawal or Douche, or Withdrawal and Douche[9]	2.7	1.9	4.8	3.2	2.4	3.0

Table 5. "Relatively fecund" couples by income, and "relatively sterile" couples and all couples regardless of income, by contraceptive methods used.

[1] Excludes three couples of unknown income.
[2] The percentages in this table do not add to 100 because many couples used more than one method during their married life.
[3] Includes the alternate use of different solutions.
[4] Diaphragm (or pessary) and jelly, with or without douche the following morning.
[5] With or without douche the following morning.
[6] Any douche.
[7] Diaphragm (or pessary), jelly, and douche (any) used immediately afterwards.
[8] Includes condom, or condom and douche (any); douche (any), or condom and douche (any); condom or douche (any), or condom and douche (any).
[9] Includes withdrawal or douche (any); withdrawal, or withdrawal and douche (any); douche (any), or withdrawal and douche (any); withdrawal or douche (any), or withdrawal and douche (any).

studies of contraceptive practices.[32] The most marked varia-

[32] For a discussion and comparison of these results *see* Riley, John Winchell and

(Continued on page 312)

tion in methods used between this and other study groups is the comparatively low reliance on withdrawal or *coitus interruptus* by itself which was used by only 6 per cent of the couples.[33] One study of several thousand couples in a socio-economic range roughly similar to that of the Indianapolis sample reports a similar figure of 4 per cent.[34] The primary explanation of the difference between these low percentages and those varying around 30 per cent reported by previous studies of birth-control clinic patients would seem to be that such couples tend to have a relatively low socio-economic status and to be actively dissatisfied, for various reasons, with whatever methods they were using prior to clinic attendance. The absence of such biases probably accounts for the fact that "diaphragm and jelly" was used more by the Indianapolis couples than by the couples who attended a birth control clinic.[35]

There are systematic differences by income in the proportions of couples ever using some of the methods listed in Table 5. A better measure of use in this connection is the ratio of exposure with each of these methods to total contraceptive exposure shown in Tables 6–8. It is evident that the use of the various kinds of douches, except Zonite douche, tends to vary inversely with income, a relationship which is consistent with the findings of other studies.[36] The use of condom, on the

White, Matilda: The Use of Various Methods of Contraception. *American Sociological Review,* December, 1940, 5, No. 6, pp. 899–903. They report Cautley and Beebe's conclusion "that the condom accounts for about 24 per cent of all contraceptive practice." (p. 901.)

Also see Himes, Norman E.: MEDICAL HISTORY OF CONTRACEPTION. Baltimore, The Williams and Wilkins Company, 1936, pp. 335–352, and Beebe, Gilbert W. and Gamble, Clarence J.: The Effect of Contraception Upon Human Fertility. *Human Biology,* 10, No. 3, 1938, p. 378.

[33] No precise comparisons with the results of previous studies are attempted in the study because of the many important differences in types of couples studied, time periods covered, and slight differences in methods of analysis that characterize these studies.

[34] Riley and White, *op. cit.,* p. 901.

[35] The Riley and White study shows that 18 per cent of the total number of contraceptors (2,005) had used diaphragm and jelly. *Ibid.,* Table 6, p. 896.

[36] For example, *see ibid.,* p. 901; Stix, Regine K., Contraception and Fertility Before Clinic Attendance, *op. cit.,* p. 84 (these data are classified on the basis of occupation).

Method of Contraception	"Relatively Fecund"				"Relatively Sterile"	All Couples
	Income of Couple					
	High	Medium	Low	Total		
Total Years of Contraceptive Exposure	2,820	5,160	4,712	12,692	1,753	14,445
Per Cent:						
Total, All Methods	100.0	99.9	99.9	99.9	99.9	100.0
Douches, All Kinds Used Singly	*23.7*	*30.5*	*34.6*	*30.5*	*51.9*	*33.1*
Douche, Water	6.1	6.2	9.1	7.3	14.6	8.2
Douche, Lysol	4.3	7.6	9.5	7.5	4.0	7.1
Douche, Salt and/or Soda	2.0	3.8	4.1	3.5	7.4	4.0
Douche, Zonite	3.7	2.7	0.3	2.0	2.1	2.0
Douche, Other	7.6	10.2	11.6	10.2	23.9	11.8
Condom	20.8	23.5	19.2	21.3	18.7	21.0
Withdrawal	5.3	2.4	5.8	4.3	2.2	4.0
Diaphragm and Jelly	10.0	6.9	7.1	7.6	2.1	7.0
Suppository	2.5	2.7	4.9	3.5	3.7	3.5
Jelly	3.5	0.8	0.4	1.3	1.5	1.3
Safe Period	1.6	0.5	0.7	0.8	1.6	0.9
Condom and Water Douche	5.6	4.6	2.6	4.1	1.6	3.8
Condom and Lysol Douche	2.9	3.0	0.8	2.1	*	1.9
Condom and Other Douche	3.7	5.6	2.8	4.1	3.2	4.0
Withdrawal and Douche	2.1	2.6	1.9	2.2	1.8	2.2
Diaphragm, Jelly, and Douche	0.8	1.2	0.4	0.8	0.0	0.7
Suppository and Douche	2.1	3.2	1.3	2.3	1.6	2.2
Safe Period and Douche	0.8	1.2	0.8	1.0	0.1	0.9
Condom or Douche	5.3	3.8	6.1	5.0	3.9	4.9
Condom or Douche, or Condom and Douche	2.3	2.3	3.6	2.8	3.2	2.8
Condom or Withdrawal	5.1	3.5	4.2	4.1	0.4	3.7
Withdrawal or Douche, or Withdrawal and Douche	1.9	1.6	2.7	2.1	2.3	2.1

Table 6. Proportion of all contraceptive exposure with specified methods, for "relatively fecund" couples by income, and for "relatively sterile" couples and all couples.[1]

* Less than six months exposure.
[1] *See* Table 5, footnotes 2–9.

other hand, is not systematically associated with the income of the couples.[37] It may be, as Riley and White suggest among other reasons, that "the use of condom may tend to increase

[37] Past studies have been inconsistent in their findings on the relation of class to the use of the condom. The Pearl and Stix studies show a direct relationship; the Riley and White data show a very slight inverse relation. No pattern of association is discernible from the data from the recent British study. *See* Papers of the Royal Commission on Population, *op. cit.*, Vol. I. Family Limitation, pp. 134–137. This comparison is not necessarily valid since the measure for this latter study is the months of exposure with individual appliance methods expressed as a proportion of all appliance exposure.

Method of Contraception	"Relatively Fecund" Income of Couple				"Relatively Sterile"	All Couples
	High	Medium	Low	Total		
Total Years of Contraceptive Exposure Before First Pregnancy	1,212	1,460	672	3,344	767	4,111
Per Cent:						
Total, All Methods	99.9	100.0	99.9	100.0	99.9	100.0
Douches, All Kinds Used Singly	*34.6*	*36.9*	*52.5*	*39.3*	*62.6*	*43.6*
Douche, Water	10.0	7.1	18.0	10.4	19.6	12.1
Douche, Lysol	5.0	9.3	12.9	8.5	5.3	7.9
Douche, Salt and/or Soda	2.5	3.4	3.4	3.1	9.8	4.3
Douche, Zonite	5.6	4.1	0.0	3.8	4.5	4.0
Douche, Other	11.5	13.0	18.2	13.5	23.4	15.3
Condom	19.2	23.3	18.0	20.7	14.4	19.6
Withdrawal	6.2	1.9	4.2	3.9	1.8	3.5
Diaphragm and Jelly	4.7	3.3	0.0	3.1	0.5	2.7
Suppository	0.1	2.0	4.8	1.9	2.2	1.9
Jelly	0.5	0.0	0.0	0.2	0.0	0.2
Safe Period	2.0	0.7	2.7	1.6	0.3	1.3
Condom and Water Douche	4.4	3.4	0.4	3.2	2.7	3.1
Condom and Lysol Douche	0.7	0.4	0.0	0.5	*	0.4
Condom and Other Douche	5.4	8.1	2.7	6.0	0.5	5.0
Withdrawal and Douche	1.0	2.7	4.3	2.4	0.4	2.0
Diaphragm, Jelly, and Douche	0.2	0.0	0.0	0.1	0.0	0.1
Suppository and Douche	2.8	3.3	0.5	2.5	2.5	2.5
Safe Period and Douche	1.1	0.2	1.1	0.7	0.0	0.6
Condom or Douche	4.7	4.4	1.5	3.9	8.1	4.7
Condom or Douche, or Condom and Douche	2.5	1.3	5.3	2.6	3.9	2.8
Condom or Withdrawal	7.0	5.0	0.6	4.8	0.0	3.9
Withdrawal or Douche, or Withdrawal and Douche	2.8	3.1	1.3	2.6	0.0	2.1

Table 7. Proportion of contraceptive exposure before the first pregnancy with specified methods, for "relatively fecund" couples by income, and for "relatively sterile" couples and all couples.[1]

* Less than six months exposure.
[1] *See* Table 5, footnotes 2–9.

with economic status only up to a certain income level."[38] The

[38] *Op. cit.*, pp. 901–902. The class divisions employed in their study represent actually only a breakdown of the urban "upper-middle" class. The Indianapolis couples, although not as narrowly restricted in terms of socio-economic status are, nevertheless, more homogeneous than the general population. Of the 1,444 "relatively fecund" couples, for example, only eleven couples reported average annual incomes since marriage of $6,000 or over which strongly suggests the absence of an "upper" class in any sense of the term. On the other hand, the educational restrictions which limited inclusion in the sample to couples with at least a grade school education and the small number of husbands (29) whose longest occupation since marriage was below the level of semi-skilled indicates the absence of any real "lower" class.

use of "diaphragm and jelly" tends to increase with income, as might be expected. Almost half of the 89 couples in the "low" income class who used this method first learned about it from a clinic after several pregnancies had occurred already. The use of the suppository tends to vary inversely with income before the first pregnancy, while reliance on jelly alone exhibits a direct association after the first pregnancy. With neither withdrawal nor "safe period" is there a marked relation between income and use. Only two of the combined methods re-

Table 8. Proportion of contraceptive exposure after the first pregnancy with specified methods, for "relatively fecund" couples by income, and for "relatively sterile" couples and all couples.[1]

Method of Contraception	"Relatively Fecund"				"Relatively Sterile"	All Couples
	Income of Couple					
	High	Medium	Low	Total		
Total Years of Contraceptive Exposure After First Pregnancy	1,608	3,700	4,040	9,348	986	10,334
Per Cent:						
Total, All Methods	100.0	100.0	100.0	100.0	99.9	99.9
Douches, All Kinds Used Singly	*15.4*	*28.0*	*31.5*	*27.5*	*43.6*	*29.0*
Douche, Water	3.2	5.9	7.7	6.2	10.7	6.6
Douche, Lysol	3.7	6.9	8.9	7.2	3.0	6.8
Douche, Salt and/or Soda	1.6	4.0	4.1	3.7	5.6	3.9
Douche, Zonite	2.3	2.1	0.3	1.4	0.1	1.3
Douche, Other	4.6	9.1	10.5	9.0	24.2	10.4
Condom	22.0	23.6	19.4	21.5	22.1	21.6
Withdrawal	4.7	2.6	6.0	4.4	2.4	4.2
Diaphragm and Jelly	14.1	8.3	8.2	9.3	3.4	8.7
Suppository	4.3	3.0	4.9	4.1	4.9	4.1
Jelly	5.8	1.0	0.5	1.6	2.7	1.7
Safe Period	1.3	0.5	0.4	0.6	2.7	0.8
Condom and Water Douche	6.4	5.1	3.0	4.4	0.8	4.1
Condom and Lysol Douche	4.5	4.0	0.9	2.7	0.0	2.5
Condom and Other Douche	2.4	4.7	2.8	3.5	5.2	3.6
Withdrawal and Douche	2.8	2.6	1.6	2.2	2.9	2.2
Diaphragm, Jelly, and Douche	1.3	1.7	0.4	1.1	0.0	1.0
Suppository and Douche	1.6	3.1	1.5	2.1	0.9	2.0
Safe Period and Douche	0.6	1.7	0.8	1.1	0.2	1.0
Condom or Douche	5.8	3.6	6.9	5.4	0.6	4.9
Condom or Douche, or Condom and Douche	2.2	2.6	3.4	2.9	2.7	2.9
Condom or Withdrawal	3.7	2.9	4.8	3.8	0.7	3.5
Withdrawal or Douche, or Withdrawal and Douche	1.1	1.0	3.0	1.9	4.1	2.1

[1] *See* Table 5, footnotes 2–9.

veal any persistent relationship between use and income. These are "condom and water douche" and "condom and Lysol douche" both of which show a positive association.

Comparison of the "relatively fecund" with the "relatively sterile" couples reveals a much higher proportion of exposure with douches (except Lysol douche) for the latter group, due mostly to large differences for water douche and "other" douche (*see* Tables 6–8). This is probably due in important degree to the fact that many of these "relatively sterile" couples did not feel the need to take greater precautions against conception.

The proportionate use of the different contraceptive methods changes significantly after the first pregnancy (compare Tables 7 and 8). The most pronounced change is found in the use of douches which decreases from 44 per cent of all exposure before the first pregnancy (for all couples) to 29 per cent after this event. Conversely, the use of diaphragm and jelly, suppository, jelly, and condom increases. These changes, as will be demonstrated in a later section of this report, reflect in large measure the trend toward the use of more effective methods which accompanies dissatisfaction with the method previously used, partly because it failed at the time of first conception, and partly because of the opportunity for medical consultation which is afforded by the experience of pregnancy.

The Communication of Information About Contraceptive Methods and Their Acceptibility

Before proceeding to an examination of the effectiveness of the different methods of contraception, it is helpful to obtain some insight into the background factors which collectively influenced the wives in this study to select certain methods rather than others.[89] To a large extent, the period of life when contraceptive methods were first learned about and first used, and the channels through which this information was dis-

[89] Early in the experimental field work it was decided for practical reasons to obtain information about contraceptive practice only from the wives.

Table 9. Interval in which wives first heard of method, for all couples ever using the method.[1]

Method of Contraception[2]	Number Ever Using[3] Method	When First Heard of Method (Cumulative Percentages)[4]			
		Before Marriage	Between Marriage and First Pregnancy[5]	Between First and Second Pregnancies	Between Second and Third Pregnancies
All Contraception	1,743	38.5	83.1	95.4	98.6
Douche, Water	181	38.7	86.2	95.0	97.2
Douche, Lysol	234	39.3	75.2	92.3	97.9
Douche, Salt and/or Soda	82	23.2	61.0	87.8	97.6
Douche, Zonite	55	34.5	90.9	100.0	100.0
Douche, Other	268	38.1	73.9	87.7	97.8
Condom	471	32.7	73.3	88.8	95.8
Withdrawal	91	19.8	58.3	88.0	93.5
Diaphragm and Jelly	227	5.3	15.4	40.1	67.9
Suppository	143	9.8	35.7	74.2	86.1
Jelly	40	0.0	5.0	55.0	72.5
Safe Period	33	48.5	60.6	84.8	93.9
Condom and Water Douche	90	38.9	70.0	90.0	92.2
Condom and Lysol Douche	39	23.1	56.4	94.9	100.0
Condom and Other Douche	71	39.4	71.8	100.0	100.0
Withdrawal and Douche	45	24.4	62.2	91.1	93.3
Diaphragm, Jelly and Douche	26	0.0	3.8	26.9	57.7
Suppository and Douche	75	10.7	48.0	70.7	85.4
Safe Period and Douche	23	30.4	52.1	86.9	91.2
Condom or Douche	117	38.5	67.6	97.5	99.2
Condom or Douche, or Condom and Douche	66	39.4	75.8	92.5	97.0
Condom or Withdrawal	55	29.1	63.6	92.7	100.0
Withdrawal or Douche, or Withdrawal and Douche	47	19.1	68.0	85.0	89.3

[1] *See* Table 5, footnotes 2–9.
[2] In this table douching "for cleanliness only" is not considered contraception.
[3] Excludes those wives who reported the time of first information as unknown.
[4] Wives who had n pregnancies and first heard of the method after the nth pregnancy are shown as having heard of it between the nth and nth $+1$ pregnancies.
[5] Includes wives who reported first hearing of method "at marriage."

Method of Contraception[2]	When First Heard of Method[3] (Cumulative Percentages)					
	Before Marriage			From Marriage to Before First Pregnancy		
	Income of Couple					
	High	Medium	Low	High	Medium	Low
All Contraception	48.2	36.2	29.9	95.1	82.7	71.9
Douche, Water	40.6	37.5	29.3	100.0	91.7	70.7
Douche, Lysol	62.1	41.3	27.7	96.6	80.0	58.5
Douche, Other	43.9	39.5	33.7	87.8	73.7	60.7
Condom	37.2	34.3	22.8	78.7	75.3	59.1
Diaphragm and Jelly	14.3	2.9	2.3	26.8	20.3	4.7
Condom and Water Douche	47.6	41.9	28.6	85.7	64.5	53.6
Condom or Douche	73.9	32.4	25.0	91.3	78.4	41.7

Table 10. Interval in which wives first heard of method, for "relatively fecund" couples ever using selected methods, by income.[1]

[1] *See* Table 5, footnotes 2–9. *See also* Table 9, footnotes 4 and 5.
[2] In this table douching "for cleanliness only" is not considered contraception.
[3] Excludes those wives who reported the time of first information as unknown.

seminated, may be considered as important antecedents to the subsequent degree of the effectiveness of contraceptive practice. Attention in this section, therefore, will be focused upon these sociological factors as well as upon the psychological complexities attending the preferences for and dissatisfactions with particular methods.[40]

The period of life in which wives first learned of the contraceptive method which they later used is of obvious significance for the question of effectiveness of practice. If information about the more effective techniques is late in arrival it probably means that more unplanned pregnancies will occur than would have otherwise.[41] The data about time of learning which are presented in Table 9 and in some of the subsequent tables suffer definite limitations. In the first place, the data were collected and coded for interpregnancy intervals which means,

[40] In most of the tables that follow, data for the "relatively fecund" and "relatively sterile" couples have been presented together and referred to as "all couples." Before reaching this decision, however, the two sets of data were analyzed independently and compared. With a few minor exceptions which will be mentioned, there are no significant differences between the two.

[41] For an analysis of this relationship from the point of view of fertility-planning status, *see* Whelpton and Kiser, *op. cit.* VI. The Planning of Fertility, pp. 92–94 (Reprint pp. 238–240).

Between First and Second Pregnancies		
High	Medium	Low
100.0	95.9	90.3
100.0	93.8	91.4
96.6	100.0	85.1
95.1	89.5	80.9
90.4	90.4	78.7
44.6	52.2	20.9
100.0	96.8	71.4
100.0	97.3	95.8

for example, that the childless couples who learned about a method relatively late in married life are restricted to the "from marriage to first pregnancy" category. The categories for couples with one or two pregnancies are also restricted in a similar manner. The primary purpose in organizing these data in this manner was, of course, to show the influence of each pregnancy on the acquisition of contraceptive information. Secondly, these tables do not include all of the couples who know about methods A, B, etc., but only about those who use these methods.[42]

Because of these rather serious restrictions of the data, only a few remarks can be made. It is apparent that the wives of those couples using douches, condom, or safe period, first heard about the method comparatively early, averaging over 30 per cent before marriage. Conversely, less than 10 per cent of the wives of those couples employing diaphragm and jelly, jelly alone or suppository, first heard about these methods at this early period. In fact, 60 per cent of those using diaphragm and jelly did not learn of this method until sometime after their second pregnancy.

The data in Table 9 show unmistakably that the experience of the first pregnancy, as well as marriage itself, exerted a significant influence on the acquisition of first information about the various methods. Although more than half of the wives had learned about most of the methods they used before the first pregnancy, a significant proportion obtained their first information after the first conception but before the second.

To a considerable extent, the time at which the wife first heard about contraception is a function of economic status. An attempt has been made in Table 10 to evaluate this influence by controlling the factor of class differentials in the use

[42] These limitations apply equally to Tables 10–12.

Table 11. Interval in which method was first used, for all couples ever using the method.[1]

Method of Contraception[2]	Number Ever Using Method	When First Used Method (Cumulative Percentages)[3]			
		At (or Before) Marriage	After Marriage But Before First Pregnancy[4]	Between First and Second Pregnancies	Between Second and Third Pregnancies
All Contraception	1,764		71.7[5]	92.2	97.4
Douche, Water	216	45.8	63.4	83.8	93.1
Douche, Lysol	240	56.3	62.6	84.7	92.6
Douche, Salt and/or Soda	91	39.6	46.2	75.9	93.5
Douche, Zonite	58	69.0	79.3	86.2	96.5
Douche, Other	287	51.9	60.6	78.7	90.5
Condom	497	46.7	51.5	76.4	90.7
Withdrawal	110	31.8	34.5	65.4	86.3
Diaphragm and Jelly	235	7.2	10.2	31.9	62.1
Suppository	145	29.0	34.5	70.4	83.5
Jelly	43	0.0	4.7	58.2	74.5
Safe Period	40	30.0	30.0	67.5	95.0
Condom and Water Douche	98	31.6	34.7	64.3	76.5
Condom and Lysol Douche	44	22.7	27.2	74.9	84.0
Condom and Other Douche	81	44.4	44.4	77.7	92.5
Withdrawal and Douche	55	23.6	25.4	61.8	78.2
Diaphragm, Jelly, and Douche	26	0.0	3.8	19.2	57.7
Suppository and Douche	77	40.3	48.1	68.9	80.6
Safe Period and Douche	23	8.7	34.8	65.2	91.3
Condom or Douche	134	33.6	36.6	69.4	94.0
Condom or Douche, or Condom and Douche	75	38.7	38.7	68.0	92.0
Condom or Withdrawal	67	35.8	43.3	86.6	97.0
Withdrawal or Douche, or Withdrawal and Douche	55	41.8	41.8	70.9	83.6

[1] *See* Table 5, footnotes 2–9.
[2] In this table douching "for cleanliness only" is not considered contraception.
[3] Wives who had *n* pregnancies and first used the method after the *n*th pregnancy are shown as having used it between the *n*th and *n*th + 1 pregnancies.
[4] Includes wives who reported first using the method "at (or before) marriage."
[5] The punch card series from which the data on "all contraception" were taken does not permit the separation of these first two categories.

of the different methods. Complete income comparisons can be made only for seven methods which are used by a sufficient number of couples[43] in each income group to permit statistical manipulation. For virtually every comparison it is evident that a higher income status is associated with an early acquisition of information about contraception.

The pattern for period of first use of the different methods is quite similar to that for period of first information (*see* Table 11). The simpler techniques of douche and condom appear very early in use, and the comparatively complicated technique of diaphragm and jelly appears last. Only 7 per cent of the couples ever using this method began to do so "at marriage" and only 62 per cent had begun before the third pregnancy. This delay in the use of one of the most potentially effective of all contraceptives is probably due mainly to the fact that couples who had been unsuccessful in controlling their fertility decided eventually to seek professional advice from physicians and clinics who recommended diaphragm and jelly. The fact that the fitting of a diaphragm requires medical service certainly retards its adoption. Other factors that may have operated at the time of marriage for these couples (1927–1929) are the expense involved, the feeling that the method was complicated, and especially, as alluded to above, the comparative ignorance of the existence of this method.

For each of the methods used, there is definite evidence that economic status plays an important role in the time of its adoption (*see* Table 12) as well as in the time when the information about it was first obtained. In both cases the relation is positive.

More direct evidence about the order of use of the different methods is contained in Table 13. Douches and condom tend to be used first and diaphragm and jelly to be adopted only after previous experimentation with other techniques (43 per cent of the couples reporting the latter method had tried at least two others previously). Comparison of the proportions

[43] The minimum number was defined arbitrarily as twenty couples.

Method of Contraception[2]	When First Used Method (Cumulative Percentages)					
	At (or Before) Marriage			After Marriage but Before First Pregnancy		
	Income of Couple					
	High	Medium	Low	High	Medium	Low
All Contraception	*	*	*	87.7	73.6	56.7
Douche, Water	58.8	42.1	37.9	100.0	87.7	65.2
Douche, Lysol	96.6	51.9	38.9	96.6	87.0	75.8
Douche, Other	82.9	56.4	42.7	95.1	87.2	67.7
Condom	52.1	43.8	37.7	84.4	74.7	60.9
Diaphragm and Jelly	12.3	11.0	0.0	36.8	43.8	14.6
Condom and Water Douche	50.0	31.4	12.9	72.7	80.0	35.5
Condom or Douche	39.3	43.9	12.5	92.9	70.7	51.8

Table 12. Interval in which method was first used for "relatively fecund" couples ever using selected methods, by income.[1]

* *See* Table 11, footnote 5.
[1] *See* Table 5, footnotes 2–9. *See also* Table 11, footnotes 3 and 4.
[2] In this table douching "for cleanliness only" is not considered contraception.

using a method first with those using it as the last method before the interview, which represents a crude index of satisfaction or acceptability of a method, reveals marked reductions in the various douches used alone and in the safe period, and marked increases in diaphragm and jelly and some of the combined techniques. The over-all proportion of "all couples" whose last method differs from their first is 45 per cent.[44]

In a society in which the subject of contraception is to a great extent a very personal and intimate matter, the question of how the married woman or wife-to-be acquires her first information about various methods is of especial interest. Whether the channels of communication through which this type of information is disseminated are also of importance to the question of successful fertility planning depends on the degree to which the different sources of information are associated with methods of low or high effectiveness. In this discussion Tables 14 and 15 can be considered jointly since they present essentially the same relationships.[45]

[44] This material is treated more extensively in the last section of this paper.
[45] The only difference of any significance between the two is the greater repre-
(Continued on page 323)

Between First and Second Pregnancies		
High	Medium	Low
96.9	93.6	87.6
100.0	96.5	81.8
96.6	90.9	89.5
100.0	94.9	82.3
96.9	93.8	76.8
77.2	75.3	38.2
86.4	97.1	45.2
100.0	92.7	91.1

The four chief sources of information for virtually all the methods of contraception are the husband, friend, relative, and doctor. The importance of any one of these four sources, however, varies significantly among the different methods. Generally speaking, the wife who uses douches or safe period by themselves obtains her information from relatives and friends. The husband is the main source of information about the male contraceptives of condom, withdrawal, and related techniques, and the doctor is cited as the chief informant about the more complicated methods as, for example, diaphragm and jelly. Printed material is more important for Zonite douche and jelly than for other methods but even for these two it ranks third. Of particular interest in these data is the almost completely insignificant role played by the druggist and clinic as sources of contraceptive information. The druggist is of some importance to the wife[46] only for the communication of information about jelly and the clinic only for diaphragm and jelly.

Income comparisons reveal only two significant differences in sources of information that are not a function of the differences in types of contraceptives most frequently used in the different classes. These exceptions are the expected greater representation of the doctor as a source in the higher-income groups and the higher incidence of the clinic in the lower-income class.

sentation of the "doctor" as a source of most satisfactory information than as a source of first information.

Essentially the same pattern of relationships appears for the sources of information for the "relatively fecund" couples as for the "relatively sterile" couples with the exception of the fact that the "doctor" is a more frequently cited source for the latter. This undoubtedly reflects the closer and more frequent contacts with doctors that these couples were likely to have because of their reproductive complications.

[46] In all likelihood, the druggist is probably more important as a secondary source of information in conveying information to the husband who subsequently becomes the direct source of information for the wife.

Table 13. Order of first use among all methods, for all couples ever using the method.[1]

Method of Contraception[2]	Number Ever Using Method	Order of First Use					Last Method Used Before Interview
		Total	First	Second	Third	Fourth to Eighth	
Douche, Water	216	100.1	65.3	28.2	5.6	1.0	46.3
Douche, Lysol	240	100.0	78.8	17.9	2.1	1.2	32.5
Douche, Salt and/or Soda	91	100.0	61.5	25.3	8.8	4.4	45.1
Douche, Zonite	58	100.0	79.3	13.8	6.9	0.0	41.4
Douche, Other	287	100.0	72.8	20.6	5.2	1.4	55.7
Condom	497	100.0	63.8	26.6	7.2	2.4	61.6
Withdrawal	110	99.9	54.5	32.7	10.0	2.7	59.1
Diaphragm and Jelly	235	100.1	14.9	41.7	25.1	18.4	70.2
Suppository	145	100.0	53.8	29.7	11.7	4.8	44.8
Jelly	43	100.0	18.6	46.5	27.9	7.0	39.5
Safe Period	40	100.0	65.0	12.5	20.0	2.5	27.5
Condom and Water Douche	98	100.0	39.8	32.7	14.3	13.2	71.4
Condom and Lysol Douche	44	100.0	43.2	38.6	11.4	6.8	65.9
Condom and Other Douche	81	99.9	58.0	22.2	12.3	7.4	76.5
Withdrawal and Douche	55	100.0	30.9	38.2	14.5	16.4	70.9
Diaphragm, Jelly, and Douche	26	99.9	3.8	30.8	42.3	23.0	69.2
Suppository and Douche	77	100.0	53.2	27.3	15.6	3.9	32.5
Safe Period and Douche	23	99.9	8.7	73.9	13.0	4.3	60.9
Condom or Douche	134	100.0	44.0	36.6	16.4	3.0	32.8
Condom or Douche, or Condom and Douche	75	100.1	42.7	42.7	12.0	2.7	56.0
Condom or Withdrawal	67	100.0	62.7	35.8	1.5	0.0	50.7
Withdrawal or Douche, or Withdrawal and Douche	55	100.0	47.3	34.5	9.1	9.1	43.6

[1] *See* Table 5, footnotes 2–9.
[2] In this table "douching for cleanliness only" is not considered contraception.

Table 14. Source of wife's first information about the method, for all couples ever using the method.[1]

Method of Contraception[2]	Number Ever Using Method[3]	Source of First Information[4]							
		Doctor	Husband	Relative	Friend	Printed Material	Druggist	Clinic	Other
All Contraception	1,845	15.9	27.8	28.3	26.6	5.7	2.2	0.3	6.3
Douche, Water	199	16.6	6.5	46.2	26.1	6.0	0.0	0.0	4.0
Douche, Lysol	238	15.5	8.0	38.2	30.7	9.2	1.7	0.0	5.0
Douche, Salt and/or Soda	85	22.4	4.7	55.3	23.5	0.0	0.0	0.0	0.0
Douche, Zonite	58	5.2	12.1	27.6	31.0	20.7	0.0	0.0	6.9
Douche, Other	283	25.1	9.2	30.4	31.8	5.7	2.5	0.0	8.5
Condom	489	11.2	58.3	8.4	23.1	2.0	1.0	0.4	2.5
Withdrawal	106	5.7	76.4	4.7	14.2	4.7	0.0	0.0	0.0
Diaphragm and Jelly	235	54.0	2.1	8.5	16.2	2.6	7.2	18.3	3.8
Suppository	145	10.3	4.8	17.2	50.3	6.9	5.5	0.0	10.3
Jelly	43	44.2	4.7	4.7	25.6	14.0	25.6	0.0	0.0
Safe Period	38	5.3	2.6	28.9	44.7	7.9	0.0	0.0	18.4
Condom and Water Douche	96	20.8	35.4	27.1	26.0	9.4	1.0	0.0	2.1
Condom and Lysol Douche	44	25.0	45.5	38.6	20.5	6.8	2.3	0.0	6.8
Condom and Other Douche	80	28.8	60.0	20.0	13.8	8.7	6.3	0.0	5.0
Withdrawal and Douche	54	22.2	25.9	25.9	24.1	3.7	0.0	3.7	5.6
Diaphragm, Jelly, and Douche	26	34.6	15.4	23.1	19.2	7.7	11.5	11.5	0.0
Suppository and Douche	77	19.5	10.4	31.2	37.7	11.7	0.0	0.0	5.2
Safe Period and Douche	21	42.9	0.0	14.3	23.8	9.5	4.8	0.0	14.3
Condom or Douche	125	24.8	49.6	24.8	29.6	5.6	0.8	0.0	4.0
Condom or Douche, or Condom and Douche	72	9.7	38.9	25.0	41.7	6.9	6.9	0.0	0.0
Condom or Withdrawal	67	9.0	67.2	10.4	16.4	3.0	3.0	0.0	3.0
Withdrawal or Douche, or Withdrawal and Douche	55	20.0	58.2	27.3	30.9	5.5	0.0	0.0	7.3

[1] *See* Table 5, footnotes 2–9.
[2] In this table douching "for cleanliness only" is not considered contraception.
[3] Excludes those wives who reported the source of first information as unknown.
[4] The percentages in the rows add to more than 100 per cent because of multiple codes necessitated by wives who reported two (or more) sources of information as first, e.g., doctor and husband.

Table 15. Source of wife's most satisfactory information about the method, for all couples ever using the method.[1]

Method of Contraception[2]	Number Ever Using Method[3]	Source of First Information[4]							
		Doctor	Husband	Relative	Friend	Printed Material	Druggist	Clinic	Other
Douche, Water	174	19.0	7.5	47.7	21.8	5.2	1.1	0.0	4.0
Douche, Lysol	231	14.7	10.0	35.5	29.0	8.7	0.0	0.0	3.5
Douche, Salt and/or Soda	79	27.8	10.1	46.8	19.0	0.0	0.0	0.0	1.3
Douche, Zonite	57	15.8	12.3	24.6	31.6	15.8	0.0	0.0	0.0
Douche, Other	267	29.6	8.2	29.2	27.3	3.7	2.6	0.0	7.9
Condom	463	18.8	60.0	8.9	12.1	1.7	0.6	0.4	1.3
Withdrawal	100	8.0	79.0	4.0	9.0	0.0	0.0	0.0	0.0
Diaphragm and Jelly	227	55.1	3.5	4.0	5.7	3.1	5.3	27.3	0.9
Suppository	141	12.8	6.4	17.7	45.4	4.3	7.1	0.0	8.5
Jelly	39	33.3	5.1	5.1	23.1	10.3	28.2	0.0	0.0
Safe Period	29	10.3	10.3	24.1	34.5	6.9	0.0	0.0	17.2
Condom and Water Douche	94	25.5	37.2	18.1	19.1	9.6	1.1	0.0	0.0
Condom and Lysol Douche	44	27.3	45.5	18.2	13.6	4.5	2.3	0.0	0.0
Condom and Other Douche	79	30.4	58.2	8.9	6.3	6.3	5.1	0.0	5.1
Withdrawal and Douche	52	19.2	59.6	23.1	17.3	3.8	0.0	3.8	1.9
Diaphragm, Jelly, and Douche	24	50.0	4.2	4.2	16.7	8.3	16.7	0.0	8.3
Suppository and Douche	67	23.9	9.0	29.9	25.4	11.9	0.0	0.0	6.0
Safe Period and Douche	20	50.0	0.0	15.0	20.0	15.0	5.0	0.0	10.0
Condom or Douche	119	26.9	40.3	21.0	21.8	4.2	0.8	0.0	0.0
Condom or Douche, or Condom and Douche	65	23.1	55.4	12.3	21.5	4.6	7.7	0.0	0.0
Condom or Withdrawal	67	7.5	59.7	10.4	16.4	3.0	3.0	0.0	3.0
Withdrawal or Douche, or Withdrawal and Douche	53	18.9	47.2	28.3	18.9	0.0	0.0	0.0	5.7

[1] *See* Table 5, footnotes 2–9. It was impossible to present data in this table for "all contraception" because the appropriate punch card series does not include this item for the "relatively sterile" couples.

[2] In this table douching "for cleanliness only" is not considered contraception.

[3] Excludes those wives who reported the source of most satisfactory information as unknown.

[4] The percentages in the rows add usually to more than 100 per cent because of multiple codes necessitated by wives who reported two (or more) sources of information as most satisfactory, e.g., doctor and husband.

The complex of subjective evaluations which constitute the rationale underlying the adoption, use, and change of a contraceptive method constitutes an important aspect of the subject of acceptability of method.[47] That acceptability and effectiveness are related empirically will be demonstrated in a later section. It is obvious, of course, that a method can be effective only if it is used, and that a method which is felt to be unduly expensive, inconvenient, irritating, or unreliable, will not be used regardless of how effective it might be theoretically. Thus, it is necessary in any study of this nature to take into account the so-called "human equation" or the personal, subjective variability of the individuals involved.

The reasons offered by the wife for using a particular method are presented in Table 16. They include all the reasons that were offered for (a) preferring this method at the time it was first used, and/or (b) returning to it after changing from it to another method. The table does not include reasons for continuing to use a method after a period of several months of uninterrupted use. Not all of the categories are reasons in a strictly logical sense, e.g., "recommended by relative, friend, etc." but, nevertheless, are presented here because they represent statements which occurred on an important number of schedules as the only reasons given.

By far the outstanding consideration for the use of a method is the feeling that it is "reliable." Although the proportions of couples stating this as a reason varies significantly among the methods, it appears as the most frequently cited reason for the use of every method except the douches used singly. Among this latter group the reason of "cleanliness and sanitation" appears of greater importance.[48] The fact that a par-

[47] In studies of clinical populations, acceptability has been measured in terms of length of use of the prescribed method, initiative in renewing supplies, reactions to the prescription, and reasons for discontinuance. *See,* for example, Chapter VI in Beebe, *op. cit.,* pp. 154–181.

[48] The more frequent citation of this reason is the only significant difference between the "relatively fecund" and "relatively sterile" couples with respect to reasons for using a method. As would be expected, the "relatively sterile" couples who used douches gave more consideration to this factor.

Table 16. Reasons given by wife for using a particular method rather than others, for all couples ever using the method.[1]

Method of Contraception[2]	Number Ever Using Method[3]	Reasons for Using Method[4]										
		Cleanliness, Sanitation	Inexpensive	Convenient	Reliable	Does Not Interfere With Enjoyment	Beneficial Not Irritating	Recommended By Relative, Friend, Fellow Worker, Or Druggist	Recommended By Doctor or Clinic	Husband's Choice	Only Method Known	Other[5]
Douche, Water	206	26.7	4.4	2.4	24.8	2.4	9.7	6.8	5.3	1.0	25.7	15.0
Douche, Lysol	231	23.8	4.8	9.5	28.6	6.1	5.6	6.5	8.7	0.9	31.2	19.9
Douche, Salt and/or Soda	91	20.9	5.5	3.3	17.6	7.7	12.1	9.9	14.3	1.1	23.1	24.2
Douche, Zonite	58	32.8	3.4	0.0	20.7	5.2	13.8	10.3	3.4	0.0	22.4	24.1
Douche, Other	263	26.6	3.4	2.7	23.2	5.3	12.5	15.2	20.9	1.1	17.5	12.9
Condom	482	0.4	1.5	6.8	67.4	2.1	1.7	2.9	10.6	17.2	14.9	14.5
Withdrawal	105	0.0	7.6	11.4	36.2	12.4	10.5	1.9	1.9	29.5	20.0	19.0
Diaphragm and Jelly	233	0.0	1.3	7.7	68.7	19.3	4.7	3.9	61.4	0.9	4.3	9.4
Suppository	141	0.0	2.1	13.5	40.4	17.7	1.4	17.7	8.5	0.0	12.8	13.5
Jelly	39	0.0	0.0	15.4	56.4	30.8	7.7	5.1	38.5	0.0	5.1	10.3
Safe Period	35	0.0	2.9	22.9	37.1	0.0	8.6	11.4	5.7	0.0	25.7	22.9
Condom and Water Douche	96	15.6	2.1	6.3	67.7	5.2	3.1	0.0	8.3	4.2	20.8	11.5
Condom and Lysol Douche	44	27.3	4.5	4.5	86.3	0.0	0.0	2.3	18.2	4.5	13.6	11.4
Condom and Other Douche	79	17.7	2.5	5.1	81.0	0.0	6.3	0.0	17.7	5.1	12.7	15.2
Withdrawal and Douche	53	18.9	1.9	13.2	56.6	11.3	1.9	3.8	11.3	7.5	9.4	17.0
Diaphragm, Jelly, and Douche	26	3.8	0.0	0.0	88.5	23.1	11.5	0.0	30.8	0.0	0.0	0.0
Suppository and Douche	74	5.4	1.4	5.4	59.5	8.1	8.1	9.5	14.9	6.8	10.8	13.5
Safe Period and Douche	23	21.7	17.4	30.4	56.5	8.7	4.3	4.3	13.0	0.0	8.7	17.4
Condom or Douche	132	9.1	6.1	16.7	63.6	9.1	7.6	2.3	18.2	3.8	12.1	17.4
Condom or Douche, or Condom and Douche	71	16.9	1.4	4.2	74.6	5.6	2.8	2.8	8.5	14.1	9.9	8.5
Condom or Withdrawal	65	6.2	4.6	24.6	36.9	9.2	4.6	0.0	6.2	33.8	9.2	10.8
Withdrawal or Douche, or Withdrawal and Douche	53	20.8	13.2	13.2	50.9	13.2	0.0	1.9	3.8	9.4	11.3	26.4

[1] *See* Table 5, footnotes 2–9.
[2] In this table douching "for cleanliness only" is not considered contraception.
[3] Excludes those wives not reporting the reason for use.
[4] Includes all the reasons given for preferring this method at the time it was first used, and/or for returning to it after changing from it to another method. Excludes reasons which were given for continuing it after a period of several months of uninterrupted use. Multiple reasons account for the percentages in the lines adding to more than 100 per cent.
[5] Includes the following reasons of comparatively minor importance: postpone rather than prevent conception; recommended by door-to-door saleswoman, in advertisement, in book, etc.; "best" or "most satisfactory" given as only reason; more modern; natural; experimenting; religious beliefs; not messy; wife wanted husband to "take responsibility;" changed to another method, then resumed this; and other specific reasons not

ticular method was the only one known at the time of first adoption is of some significance also, particularly for the douche category again. This consideration makes more intelligible our previous observation that douches are adopted early in marriage.

In comparison with the reason of "reliability" other reasons are of only occasional subsidiary importance. The feeling that the method is used because it is inexpensive is of almost no significance whatsoever. "Convenience" as a reason for use is of slight importance and for only a few of the methods listed. Strangely enough, the feeling that a method "does not interfere with enjoyment" is of importance only for jelly, diaphragm and jelly, and a few other methods. Comparison of the percentages in this column with those under the same heading in Table 17 suggests that this is primarily a negative consideration. The wife's statement that the use of a method was due to her husband's choice is of secondary significance only and for the methods of withdrawal and condom.

In general, it may be concluded that the feeling that a method is "reliable" is without question the most important consideration attending the choice of a contraceptive method. Other reasons appear occasionally for certain methods but on the whole are relatively unimportant.

It might be expected on sociological grounds that some of these reasons would be more characteristic of one economic class than another. Nonetheless, an analysis of these relationships, holding constant the factor of method, uncovered a slight association for only one of the reasons, namely,[49] an inverse association of income with the citation of "reliability" as a reason. If this association is valid, it may occur because the need for a reliable method is felt more in the lower-income group which has experienced more unplanned pregnancies.

In Table 17 are presented all the reasons given by the wife for every change from one method to another, or for discontinuing the method for other reasons than a desire to have a

[49] These data are not presented here because of space limitations.

Table 17. Reasons given by wife for changing method, for all couples ever using and changing the method.[1]

Method of Contraception[2]	Number Ever Using Method	Per Cent Who Did Not Change	Per Cent Who Did Change[3]	Reasons for Changing Method[4]						
				Expensive	Inconvenient	Unreliable	Interferes With Enjoyment or Messy	Health	Doctor Recommended Change	Other[5]
Douche, Water	216	45.8	54.2	1.0	11.8	95.1	2.0	2.0	8.8	3.9
Douche, Lysol	240	28.3	71.7	0.6	6.5	67.7	1.9	12.9	16.1	9.0
Douche, Salt and/or Soda	91	40.7	59.3	0.0	5.3	92.1	0.0	0.0	7.9	15.8
Douche, Zonite	58	34.5	65.5	0.0	6.1	78.8	0.0	3.0	15.2	12.1
Douche, Other	287	48.4	51.6	3.5	8.8	77.2	0.0	3.5	10.5	16.7
Condom	497	59.4	40.6	11.5	9.9	31.3	41.8	3.8	12.6	19.2
Withdrawal	110	56.4	43.6	0.0	0.0	44.4	40.0	13.3	6.7	8.9
Diaphragm and Jelly	235	68.1	31.9	12.2	20.3	33.8	10.8	5.4	6.8	44.6
Suppository	145	37.2	62.8	14.1	16.5	62.4	8.2	5.9	7.1	10.6
Jelly	43	30.2	69.8	3.8	3.8	61.5	15.4	0.0	0.0	19.2
Safe Period	40	27.5	72.5	0.0	3.7	81.5	0.0	0.0	3.7	11.1
Condom and Water Douche	98	71.4	28.6	0.0	12.0	28.0	20.0	4.0	8.0	48.0
Condom and Lysol Douche	44	56.8	43.2	*	*	*	*	*	*	*
Condom and Other Douche	81	71.6	28.4	10.0	20.0	35.0	60.0	15.0	15.0	10.0
Withdrawal and Douche	55	61.8	38.2	*	*	*	*	*	*	*
Diaphragm, Jelly, and Douche	26	69.2	30.8	*	*	*	*	*	*	*
Suppository and Douche	77	33.8	66.2	12.5	12.5	58.3	0.0	2.1	6.3	22.9
Safe Period and Douche	23	52.2	47.8	*	*	*	*	*	*	*
Condom or Douche	134	38.1	61.9	6.1	12.2	70.7	41.5	1.2	4.9	2.4
Condom or Douche, or Condom and Douche	75	53.3	46.7	7.1	17.9	53.6	25.0	3.6	0.0	10.7
Condom or Withdrawal	67	50.7	49.3	12.9	6.5	32.3	32.3	0.0	22.6	9.7
Withdrawal or Douche, or Withdrawal and Douche	55	38.2	61.8	*	*	*	*	*	*	*

* Percentages not computed where fewer than twenty couples changed method for known reasons.

[1] *See* Table 5, footnotes 2–9.

[2] In this table douching "for cleanliness only" is not considered contraception.

[3] Includes those couples who changed for unknown reasons. The percentages computed for stated reasons, however, are exclusive of cases where the reason for change was not reported. The percentages usually add to more than 100 because the interviewers were instructed to record all reasons for change given by the respondents and frequently more than one reason was given.

[4] Includes reasons for every change from one method to another and for discontinuing the method and entering periods of noncontraceptive exposure, except in order to conceive.

[5] Includes such diverse but numerically insignificant reasons as "causes irritation"; "materials used up;" "willing to use less reliable method;" "more modern methods available;" "wife wanted husband to take responsibility;" etc.

child. These reasons for change to some extent complement the reasons for using the method.[50] The feeling that a method was "unreliable" accounts for most of the changes to another method. The proportion of couples who discontinued a method for this stated reason ranges from 95 per cent for water douche to 31 per cent for condom. The feeling that the method "interferes with enjoyment or is messy" is an important consideration only in the methods of condom or withdrawal alone, or in combined or alternate methods involving either of these two techniques. It will be observed in Table 17 that the most frequently cited reasons for change from diaphragm and jelly appear under the category "Other." A breakdown of this group reveals that half of these couples changed to another method because the necessary materials were "used up." It is also of interest to note that the proportion of couples who gave "inconvenience" as the reason for change is higher for diaphragm and jelly than for any other method. "Health" and "expensiveness" are of only negligible importance as reasons for change. Change because of a doctor's recommendation is of some importance for some of the douches, condom, and condom or withdrawal.

Unfortunately, the fact that these percentages had to be computed on the basis of those couples who changed their method resulted in an insufficient number of cases to permit any reliable economic-status comparisons. It would be expected that the same pattern of association would emerge that resulted from the "reasons for using" analysis.

In summary, it appears that the degree to which a method evokes confidence on the part of the user is the overwhelming criterion for its use or change. When the method is first tried this is mainly subjective, based on information from various sources. Later on it becomes much more objective, based on personal success or failure in controlling reproduction. It would appear, thus, that only those couples who have used methods

[50] The coefficient of rank-order correlation for methods used because they were considered to be reliable and methods changed because they were felt to be unreliable is −.70.

Method of Contraception	First Pregnancy	After First Pregnancy	All Pregnancies			
			Total	Income of Couple		
				High	Medium	Low
All Methods, Total	12	10	10	6	8	15
Douches, All Kinds Used Singly	*21*	*16*	*18*	*15*	*14*	*23*
Douche, Water	23	21	22	22	18	24
Douche, Lysol	28	18	21	*	17	24
Douche, Salt and/or Soda	27	14	17	*	4	36
Douche, Zonite	9	10	9	4	14	*
Douche, Other	18	13	15	13	13	17
Condom	5	5	5	4	5	6
Withdrawal	7	6	6	3	5	9
Diaphragm and Jelly	1	4	4	2	3	6
Suppository	12	15	15	*	9	22
Jelly	*	9	10	*	*	*
Safe Period	*	35	25	*	*	*
Condom and Water Douche	6	6	6	3	5	13
Condom and Lysol Douche	*	4	5	*	2	*
Condom and Other Douche	2	4	3	*	3	5
Withdrawal and Douche	*	6	5	*	*	6
Diphragm, Jelly, and Douche	*	5	5	*	*	*
Suppository and Douche	8	16	14	*	8	37
Safe Period and Douche	*	*	6	*	*	*
Condom or Douche	11	13	12	4	10	19
Condom or Douche, or Condom and Douche	12	5	7	*	6	7
Condom or Withdrawal	1	8	6	*	*	13
Withdrawal or Douche, or Withdrawal and Douche	*	18	17	*	*	17

Table 18. Pregnancies per 100 years exposure with specified methods of contraception for exposure when contraception was practiced "always," for "relatively fecund" couples by income.[1]

* Base less than twenty couples and/or 50 exposure-years.
[1] *See* Table 5, footnotes 2–9. *See* Appendix I for number of exposure-years on which rates were computed.

successfully can afford the luxury of considerations other than reliability.

The Effectiveness of the Different Methods of Contraception

Any attempt to measure the effectiveness of a given method of contraception among a large group of people cannot deal with the method's theoretical or potential effectiveness but is restricted to its observed or actual effectiveness. Beebe has conceptualized this problem[51] in terms of what he calls "physio-

[51] *Op. cit.*, p. 101.

Method of Contraception	First Pregnancy	After First Pregnancy	All Pregnancies			
			Total	Income of Couple		
				High	Medium	Low
All Methods, Total	103	124	118	186	151	80
Douches, All Kinds Used Singly	*56*	*74*	*67*	*80*	*86*	*53*
Douche, Water	53	57	55	56	65	50
Douche, Lysol	42	67	58	*	72	50
Douche, Salt and/or Soda	45	84	70	*	291	33
Douche, Zonite	136	122	129	295	88	*
Douche, Other	65	94	82	91	91	72
Condom	251	225	232	269	234	208
Withdrawal	174	205	196	452	240	138
Diaphragm and Jelly	1,264	295	322	557	472	185
Suppository	103	79	82	*	127	54
Jelly	*	141	126	*	*	*
Safe Period	*	34	49	*	*	*
Condom and Water Douche	210	190	194	375	260	92
Condom and Lysol Douche	*	278	248	*	615	*
Condom and Other Douche	805	278	371	*	436	264
Withdrawal and Douche	*	204	228	*	*	185
Diaphragm, Jelly, and Douche	*	242	251	*	*	*
Suppository and Douche	144	74	88	*	152	32
Safe Period and Douche	*	*	215	*	*	*
Condom or Douche	111	93	97	339	119	63
Condom or Douche, or Condom and Douche	99	233	175	*	195	170
Condom or Withdrawal	954	151	208	*	*	92
Withdrawal or Douche, or Withdrawal and Douche	*	67	72	*	*	70

Table 19. Mean number of exposure-months per conception with specified methods of contraception for exposure when contraception was practiced "always," for "relatively fecund" couples by income.[1]

* Base less than twenty couples and/or 50 exposure-years.
[1] *See* Table 5, footnotes 2–9. *See* Appendix I for number of exposure-years on which averages were computed.

logical effectiveness," which assumes that the method is employed with perfect technique and regularity, as opposed to "use-effectiveness" which reflects variations resulting from relative differences in skill and regularity. The first concept implies that a conception which occurred could be attributed directly to the methods and materials themselves; the second concept relates only to the observed effectiveness which reflects the whole range of variation in use and motivation as well as purely mechanical failures. No statistical data have ever been collected which would measure pure physiological effectiveness

Method of Contraception	First Pregnancy	After First Pregnancy	All Pregnancies			
			Total	Income of Couple		
				High	Medium	Low
All Methods, Total	15	11	12	8	10	18
Douches, All Kinds Used Singly	*26*	*18*	*21*	*18*	*17*	*26*
Douche, Water	30	23	25	23	23	27
Douche, Lysol	32	22	25	22	19	31
Douche, Salt and/or Soda	33	15	19	*	7	34
Douche, Zonite	19	12	16	11	18	*
Douche, Other	20	15	17	16	15	19
Condom	6	7	7	6	6	8
Withdrawal	9	10	10	3	12	13
Diaphragm and Jelly	1	4	4	3	3	7
Suppository	16	16	16	*	15	20
Jelly	*	10	11	*	*	*
Safe Period	*	38	26	*	*	*
Condom and Water Douche	8	7	8	5	5	15
Condom and Lysol Douche	*	5	6	*	3	*
Condom and Other Douche	2	5	3	*	3	5
Withdrawal and Douche	*	6	6	*	6	7
Diaphragm, Jelly, and Douche	*	8	8	*	*	*
Suppository and Douche	12	16	15	*	7	44
Safe Period and Douche	*	*	6	*	*	*
Condom or Douche	14	14	14	7	10	21
Condom or Douche or Condom and Douche	14	7	9	*	8	10
Condom or Withdrawal	3	10	8	*	*	16
Withdrawal or Douche, or Withdrawal and Douche	18	19	19	*	*	22

Table 20. Pregnancies per 100 years exposure with specified methods of contraception for exposure when contraception was practiced "always," "usually," or "sometimes," for "relatively fecund" couples by income.[1]

* Base less than twenty couples and/or 50 exposure-years

[1] *See* Table 5, footnotes 2–9. *See* Appendix I for number of exposure-years on which rates were computed.

nor, from the perspective of social science, is this type of data absolutely necessary.[52] It is desirable, however, to standardize the regularity of use, in so far as possible, in order to achieve some basis for the evaluation of a method. For this reason, in the data on effectiveness which follow, a distinction has been maintained between exposure during which time contraception was practiced "always" and exposure while the method was

[52] Beebe argues that even the clinician's concept of effectiveness "is academic and unreal in the sense that perfect use cannot be assumed, and that the need is for a reliable estimate of the *protection patients will derive from however they use a prescribed method.*" *Ibid.*, pp. 242–243.

Method of Contraception	First Pregnancy	After First Pregnancy	All Pregnancies			
			Total	Income of Couple		
				High	Medium	Low
All Methods, Total	80	105	97	150	122	68
Douches, All Kinds Used Singly	*46*	*65*	*57*	*67*	*70*	*46*
Douche, Water	41	53	48	52	51	44
Douche, Lysol	37	55	48	54	62	39
Douche, Salt and/or Soda	36	82	63	*	169	35
Douche, Zonite	64	97	77	104	67	*
Douche, Other	59	79	71	73	79	63
Condom	185	175	177	207	199	143
Withdrawal	131	121	123	452	99	96
Diaphragm and Jelly	1,264	273	299	424	472	182
Suppository	75	76	76	*	81	59
Jelly	*	121	111	*	*	*
Safe Period	*	31	46	*	*	*
Condom and Water Douche	141	165	160	235	221	82
Condom and Lysol Douche	*	256	204	*	370	*
Condom and Other Douche	805	260	351	*	436	226
Withdrawal and Douche	*	189	214	*	203	185
Diaphragm, Jelly and, Douche	*	150	154	*	*	*
Suppository and Douche	102	75	82	*	163	27
Safe Period and Douche	*	*	189	*	*	*
Condom or Douche	83	84	84	180	124	56
Condom or Douche, or Condom and Douche	86	161	133	*	156	114
Condom or Withdrawal	389	116	149	*	*	74
Withdrawal or Douche, or Withdrawal and Douche	66	62	64	*	*	54

Table 21. Mean number of exposure-months per conception with specified methods of contraception for exposure when contraception was practiced "always," "usually," or "sometimes," for "relatively fecund" couples by income.[1]

* Base less than twenty couples and/or 50 exposure-years.
[1] *See* Table 5, footnotes 2–9. *See* Appendix I for number of exposure-years on which averages were computed.

used only "usually" or "sometimes."[53] The pregnancy rates in Table 18 and the average number of exposure months per conception in Table 19 reflect the protection afforded by different methods of contraception when they are used with very few omissions; the data in Tables 20 and 21 manifest the decrease in effectiveness that accrues from the addition of irregularities in use and represents the results of the total contraceptive efforts of the "relatively fecund" couples.

An additional complication in evaluating method-effective-

[53] *See* second section for definitions.

ness is the fact that the experience of the same couples is not being compared.[54] It is impossible to separate completely the potential effectiveness of the method from the social and psychological factors that may differentiate the couples who use one method from those who use another. Differentiation on the basis of income class contributes a desirable but only a crude refinement.

The three most effective "single" methods of contraception, as evidenced by the rates and averages in Tables 18–21, are diaphragm and jelly, condom, and withdrawal. The least effective is "safe period" followed by the douches.[55] The combined and alternate methods are generally intermediate with the primary differentiation appearing to lie in the presence or absence of the condom as one of the component techniques. The combination of condom with "other douche," for example, results in a slight increase in protection over the use of condom alone. These general patterns of effectiveness hold true, with some minor exceptions, within the three income classes. Generally speaking, these data support previous findings of other research on the effectiveness of different methods, for example, that by Stix and Notestein,[56] and Beebe,[57] and reaffirm the position that the effectiveness of the condom argues well for its popularity and that of diaphragm and jelly for its prescription by clinics.[58]

[54] This statement is not entirely true because there are many instances where couples have changed methods (*see* Tables 13 and 17). However, the essential objection to a lack of perfect comparability holds true.

[55] The differences between the rates for the methods of douche (all kinds used singly), condom, and diaphragm and jelly are statistically significant at the 1 per cent level with the exception of the differences between the first pregnancy rates for diaphragm and jelly, and condom, which is not significant. The difference between the rates for "all douches" and withdrawal is statistically significant at the 1 per cent level but the differences between withdrawal and condom and withdrawal and diaphragm and jelly are not significant except for the difference between first pregnancy rates for withdrawal and diaphragm and jelly which is significant at the 5 per cent level.

[56] *Op. cit.*, Chapters VI and X.

[57] *Op. cit.*, Chapters IV and V.

[58] *Ibid.*, pp. 193–194. *See also* Guttmacher, Alan F.; Tietze, Christopher; and Rubin, Samuel: Contraception Among Two Thousand Obstetric Patients. *The*

(Continued on page 337)

A summary of the contraceptive experience of the total group of couples studied, i.e., the "relatively fecund" and "relatively sterile" couples[59] combined, is presented in Tables 22 and 23. In a tabulation of these data, contraceptive exposure with and without lactation is separated for the total period after the first pregnancy. The pregnancy rate for all contraceptive exposure with lactation is 7 (this rate not shown in Table 22)[60] as compared with a rate of 10 for all contraceptive exposure without lactation.[61] The difference, although not great,[62] indicates some reduction in the risk of conception during the period following parturition.[63]

The comparative effectiveness of the different contraceptive methods, viewed in conjunction with the previous analysis of the differential use of these methods by the three income classes (*see* Tables 5–8) confirms the hypothesis that the less effective techniques are used more by lower-income than by higher-income couples. Another aspect of this relationship which can be examined now is the question of the relationship between proficiency of use and economic status. In other words, is there a systematic difference in the successful appli-

Journal of the American Medical Association, August, 1949, 140, pp. 1265–1268; Cautley, Randolph and Beebe, Gilbert W.: The Condom in Modern Contraceptive Practice: A Report from the National Committee on Maternal Health, Inc., New York. *Marriage Hygiene,* August, 1936, 3, No. 1, pp. 8–22, continued in November, 1936, 3, No. 2, pp. 154–164.

[59] Pregnancy rates for the different methods for the "relatively sterile" couples are not presented separately because the comparatively small amount of contraceptive exposure of this group permitted rates to be computed only for a few methods. In the few instances where comparisons were possible there was evident no significant departure from the pattern established by the "relatively fecund" couples.

[60] The rates and averages in Tables 22 and 23 show only the differences in the risk to conception when lactation is excluded in the total contraceptive exposure after the first pregnancy. The rate of 7 (*see* above) is based on the number of conceptions occurring during months of lactation only, when contraception was practiced.

[61] These rates are for exposure when contraception was practiced "always." The rates are 8 and 11, respectively, for all regularities combined.

[62] The difference between these two rates is significant at the 1 per cent level of probability.

[63] It is unwise to place too much confidence in these rates for periods with lactation. A difference of as little as one month in the memory of the respondent would affect seriously the value of the rate if a conception occurred during this month. There is a definite possibility of this happening because the conception would be likely to occur probably toward the end of the lactation period.

Table 22. Pregnancies per 100 years exposure with specified methods of contraception used "always," and "always," "usually," or "sometimes," for exposure before and after first pregnancy, and after first pregnancy excluding lactation, for all couples.[1]

Method of Contraception	Before First Pregnancy		After First Pregnancy				All Pregnancies	
	Used "Always"	Used "Always," "Usually," or "Sometimes"	Used "Always"		Used "Always," "Usually," or "Sometimes"		Used "Always"	Used "Always," "Usually," or "Sometimes"
			Total	Excluding Lactation	Total	Excluding Lactation		
All Methods, Total	11	14	9	10	11	11	10	12
Douches, All Kinds Used Singly	*20*	*23*	*15*	*15*	*17*	*17*	*16*	*19*
Douche, Water	18	23	19	19	20	20	19	21
Douche, Lysol	29	34	18	19	22	23	21	26
Douche, Salt and/or Soda	20	23	13	13	14	14	15	17
Douche, Zonite	9	16	11	11	13	13	9	15
Douche, Other	19	18	11	11	12	13	13	15
Condom	4	6	5	5	7	8	5	7
Withdrawal	7	8	6	5	12	11	6	11
Diaphragm and Jelly	1	1	5	5	5	5	4	4
Suppository	12	15	14	15	14	15	14	14
Jelly	*	*	9	9	8	9	10	9
Safe Period	*	*	29	34	27	29	22	21
Condom and Water Douche	5	7	6	7	7	7	6	7
Condom and Lysol Douche	*	*	4	5	5	5	5	6
Condom and Other Douche	2	1	4	4	4	4	3	3
Withdrawal and Douche	*	*	6	6	6	7	5	6
Diaphragm, Jelly, and Douche	*	*	5	5	8	7	5	8
Suppository and Douche	9	11	16	15	15	14	13	14
Safe Period and Douche	*	*	*	*	*	*	6	6
Condom or Douche	9	10	13	14	14	15	12	13
Condom or Douche, or Condom and Douche	12	14	5	6	7	8	7	9
Condom or Withdrawal	1	3	8	9	10	11	6	8
Withdrawal or Douche, or Withdrawal and Douche	14	18	20	22	21	23	19	20

* Base less than twenty couples and/or 50 exposure-years.
[1] *See* Table 5, footnotes 3–9. "All couples" relates to "relatively fecund" and "relatively sterile" couples combined. *See* Appendix I for number of exposure-years on which rates were computed.

Table 23. Mean number of exposure-months with specified methods of contraception used "always," and "always," "usually," and "sometimes," for exposure before and after first pregnancy and after first pregnancy excluding lactation, for all couples.[1]

Method of Contraception	Before First Pregnancy		After First Pregnancy				All Pregnancies	
	Used "Always"	Used "Always," "Usually," or "Sometimes"	Used "Always"		Used "Always," "Usually," or "Sometimes"		Used "Always"	Used "Always," "Usually," or "Sometimes"
			Total	Excluding Lactation	Total	Excluding Lactation		
All Methods, Total	107	84	129	126	108	105	122	100
Douches, All Kinds Used Singly	*61*	*53*	*82*	*80*	*72*	*70*	*73*	*63*
Douche, Water	66	51	64	63	60	59	64	56
Douche, Lysol	41	35	66	64	54	51	56	46
Douche, Salt and/or Soda	59	53	92	94	86	86	79	72
Douche, Zonite	142	75	113	112	92	91	128	82
Douche, Other	65	65	113	107	97	93	91	82
Condom	280	189	237	233	162	159	247	169
Withdrawal	184	145	216	232	103	105	207	111
Diaphragm and Jelly	1,312	1,312	261	255	245	239	286	269
Suppository	102	79	86	82	84	79	88	83
Jelly	*	*	141	135	143	136	126	131
Safe Period	*	*	41	36	45	41	55	56
Condom and Water Douche	252	169	193	183	168	164	204	169
Condom and Lysol Douche	*	*	278	257	256	237	248	192
Condom and Other Douche	805	822	322	305	301	285	407	388
Withdrawal and Douche	*	*	199	198	187	184	223	212
Diaphragm, Jelly, and Douche	*	*	242	237	150	164	251	154
Suppository and Douche	138	105	76	81	79	83	91	86
Safe Period and Douche	*	*	*	*	*	*	219	192
Condom or Douche	137	116	93	87	84	78	102	91
Condom or Douche, or Condom and Douche	96	87	223	211	161	149	162	130
Condom or Withdrawal	954	389	154	139	118	107	211	151
Withdrawal or Douche, or Withdrawal and Douche	86	66	59	55	57	53	64	59

* Base less than twenty couples and/or 50 exposure-years.

[1] *See* Table 5, footnotes 3–9. "All couples" relates to "relatively fecund" and "relatively sterile" couples combined. *See* Appendix I for number of exposure-years on which averages were computed.

cation of a method among the income classes which is independent of the particular method? The data in Tables 18 to 21 suggest definitely that this is true. For each of the methods used for which comparisons are possible, couples in the "low" income group manifest a higher pregnancy rate than those in the "medium" or "high" income groups. In general, an overall inverse association can be observed.[64] Stated differently, the fact is that even the most effective methods are used with greater success by high-income couples than by couples lower in the income hierarchy. This relationship is more pronounced for the experience before the first pregnancy than for that following this event. (These detailed data are not presented here because of space limitations.) This difference may be due partly to the fact that couples in the low-income class start to use contraception later in marriage and thus gain proficiency at a later time. An additional consideration, of equal if not greater importance, is the probability of increased determination on the part of couples in this group to control their fertility. This whole relationship[65] reflects differences of proficiency of use when contraception is practiced "always." The pregnancy rates for "all methods"[66] when contraception was practiced "usually" or "sometimes" are 45, 37, and 48 for the "high," "medium," and "low" income groups, respectively (*see* Table 3), and do not evidence an inverse relationship.

In any study of the effectiveness of contraception there is a

[64] Chi squares were computed to test the statistical significance of the differences between the rates for each method (where at least two rates were computed) among the three income classes (rates in Table 18). The rates for the income classes differ at the 1 per cent level of significance for the following methods which were examined: douches, all kinds used singly, condom, suppository, "condom and water douche," "suppository and douche," "condom or douche;" between the 1 per cent and 2 per cent level for diaphragm and jelly; and were found to be "not significant" ($P > .05$) for withdrawal, "condom and other douche," and "condom or douche, or condom and douche."

[65] The social and psychological origins of this relationship which stem probably from class differences in education, differential sensitivities to "middle-class" values which are manifested in varying degrees of intensity of motivation to restrict size of family, and other factors of this nature, are not the subject of this present analysis. Some of these broader questions are dealt with at length in other reports in the Indianapolis Study.

[66] There is an insufficient amount of this exposure to permit the computation of rates for individual methods.

need for some quantitative measure of the proportionate decrease in the risk of conception which is afforded by the use of a given method. The conventional yardstick which has been developed usually has been referred to as the "effectiveness ratio," and represents the proportion of expected pregnancies that were prevented.[67] The short method of calculating this ratio, used by Beebe, is simply to subtract the pregnancy rate with a specific method from the pregnancy rate without contraception, divide by the latter factor, and multiply by 100.[68] The result may then be expressed as the percentage of pregnancies prevented by the use of contraception, or the percentage reduction in risk from the level expected if no contraception were used.

This entire concept of the effectiveness ratio is open to serious criticism for both theoretical and practical reasons. Some of the more important criticisms are briefly enumerated in Appendix II. Two basic problems, however, should be mentioned at this point. The first relates to the type of noncontraceptive experience which is selected as a standard. The alternatives are (a) exposure before the first use of contraception; (b) exposure following the interruption of contraception in order to conceive; or (c) all noncontraceptive exposure, i.e., both (a) and (b).[69] The alternatives competing seriously for attention are (a) and (c); for reasons given in Appendix II, alternative (a) was selected. The second problem is less serious. Because each of the methods reduced the risk greatly, the effectiveness ratios have been subtracted from 100 per cent and

[67] The method of computing this ratio is described and illustrated in Stix and Notestein, *op. cit.*, pp. 58–59 and p. 182. The shorter method used by Beebe, which is referred to here, is described along with a theoretical consideration of the concept in Beebe, *op. cit.*, pp. 239–242.

[68] For example, if the noncontraceptive pregnancy rate were 200 and the rate with contraception were 20, then the per cent protection gained by the use of contraception would be 200 – 20 divided by 200, or 90 per cent. The statistical difference between the measurement used by Stix and Notestein and by Beebe is that the former method introduces a standardization procedure to neutralize differences in age or duration of marriage. The Indianapolis data present no serious complications of this nature.

[69] More accurately, "all noncontraceptive exposure" includes also exposure following the interruption of contraception for purposes other than conception. This exposure is negligible, however. (*See* Table 1.)

are presented as *in*effectiveness ratios, except in the summary in Table 26 where, for purposes of comparability with other studies, the original effectiveness ratios are shown. The desirability of this kind of manipulation can be appreciated from the following example. The first pregnancy rates for water douche and condom are 23 and 5, respectively (Table 18). The corresponding effectiveness ratios are 88 per cent and 98 per cent. The relative difference is much greater for the rates than it is for the ratios. Transforming the latter into *in*effectiveness ratios of 12 per cent and 2 per cent restores a large relative

Table 24. Ineffectiveness ratios: the proportion of "expected" pregnancies not prevented by the use of specified methods of contraception, for "relatively fecund" couples by income, for exposure when contraception was practiced "always."[1]

Method of Contraception	First Pregnancy	After First Pregnancy	All Pregnancies			
			Total	Income of Couple		
				High	Medium	Low
All Methods, Total	5.9	9.6	8.1	4.6	6.2	13.2
Douches, All Kinds Used Singly	*10.9*	*16.0*	*13.5*	*9.4*	*10.6*	*19.0*
Douche, Water	11.7	20.8	16.2	13.1	14.2	19.2
Douche, Lysol	14.5	17.6	16.3	*	12.6	20.3
Douche, Salt and/or Soda	13.7	14.1	13.9	*	3.3	31.6
Douche, Zonite	4.5	9.7	6.2	2.5	9.4	*
Douche, Other	9.4	12.7	11.1	8.1	9.9	14.0
Condom	2.4	5.3	4.1	3.2	4.1	5.1
Withdrawal	3.5	5.8	4.9	1.8	4.1	7.8
Diaphragm and Jelly	0.5	4.0	3.3	1.8	2.2	6.4
Suppository	6.0	14.9	12.7	*	7.9	19.1
Jelly	*	8.5	9.1	*	*	*
Safe Period	*	35.2	16.7	*	*	*
Condom and Water Douche	2.9	6.2	5.1	2.4	3.8	12.6
Condom and Lysol Douche	*	4.3	4.5	*	1.9	*
Condom and Other Douche	0.8	4.3	2.4	*	2.0	4.0
Withdrawal and Douche	*	5.8	4.1	*	*	5.0
Diaphragm, Jelly, and Douche	*	4.9	4.6	*	*	*
Suppository and Douche	4.3	16.0	10.3	*	5.9	35.5
Safe Period and Douche	*	*	4.7	*	*	*
Condom or Douche	5.6	12.7	10.1	2.6	7.5	18.1
Condom or Douche, or Condom and Douche	6.2	5.1	5.5	*	5.3	5.8
Condom or Withdrawal	0.6	7.9	4.4	*	*	12.7
Withdrawal or Douche, or Withdrawal and Douche	*	17.7	13.0	*	*	16.5

* Base less than twenty couples and/or 50 exposure-years.
[1] *See* Table 5, footnotes 2–9.

difference like that of the rates. The interpretation remains absolutely the same; only the appearance changes.

The ratios in Tables 24–25 show conclusively that almost all methods of contraception are highly effective for "relatively fecund" couples *from a demographic point of view.* If these couples used one of the least effective methods "always"—the water douche—they would have only 12 of every 100 pregnancies that would occur if no contraception were practiced. Nevertheless, there are differences in effectiveness among the various methods which are highly important from a "personal"

Table 25. Ineffectiveness ratios: the proportion of "expected" pregnancies not prevented by the use of specified methods of contraception, for "relatively fecund" couples by income, for exposure when contraception was practiced "always," "usually," or "sometimes."[1]

Method of Contraception	First Pregnancy	After First Pregnancy	All Pregnancies			
			Total	Income of Couple		
				High	Medium	Low
All Methods, Total	7.7	11.3	9.8	5.7	7.7	15.5
Douches, All Kinds Used Singly	*13.4*	*18.3*	*15.8*	*11.2*	*12.8*	*21.6*
Douche, Water	15.1	22.4	18.5	13.8	17.7	21.5
Douche, Lysol	16.5	21.7	19.4	15.3	14.3	25.8
Douche, Salt and/or Soda	16.9	14.5	15.4	*	5.7	30.2
Douche, Zonite	9.6	12.2	10.5	7.1	12.6	*
Douche, Other	10.3	15.1	12.7	10.1	11.2	15.6
Condom	3.3	6.8	5.4	4.2	4.7	7.4
Withdrawal	4.7	9.8	7.8	1.8	9.9	11.3
Diaphragm and Jelly	0.5	4.3	3.6	2.4	2.2	6.5
Suppository	8.2	15.6	13.8	*	12.3	17.7
Jelly	*	9.8	10.3	*	*	*
Safe Period	*	37.5	17.7	*	*	*
Condom and Water Douche	4.3	7.2	6.2	3.8	4.5	14.1
Condom and Lysol Douche	*	4.6	5.5	*	3.1	*
Condom and Other Douche	0.8	4.6	2.5	*	2.0	4.6
Withdrawal and Douche	*	6.3	4.4	*	4.6	5.0
Diaphragm, Jelly, and Douche	*	7.9	7.5	*	*	*
Suppository and Douche	6.0	15.8	11.4	*	5.7	41.2
Safe Period and Douche	*	*	5.4	*	*	*
Condom or Douche	7.4	14.2	11.9	4.9	7.3	20.6
Condom or Douche, or Condom and Douche	7.1	7.4	7.3	*	6.6	8.7
Condom or Withdrawal	1.6	10.2	6.2	*	*	15.8
Withdrawal or Douche, or Withdrawal and Douche	9.3	19.0	14.2	*	*	20.9

* Base less than twenty couples and/or 50 exposure-years.
[1] *See* Table 5, footnotes 2–9.

	Number of Pregnancies Expected[1]	Number of Pregnancies Observed	Effectiveness Ratio[2]
	When contraception used "always"		
"Relatively Fecund"	14,906	1,207	91.9
"All Couples"	15,106	1,295	91.4
	When contraception used "always," "usually," or "sometimes"		
"Relatively Fecund"	15,985	1,567	90.2
"All Couples"	16,253	1,738	89.3

Table 26. Effectiveness ratios: the proportion of "expected" pregnancies prevented by the use of contraception, for "relatively fecund" couples and for all couples according to regularity of contraceptive practice.

[1] The number of exposure-years with contraception before the first pregnancy, multiplied by the first-pregnancy rate without contraception, divided by 100, *plus* the number of exposure-years with contraception after the first pregnancy, multiplied by the later-pregnancy rate without contraception, divided by 100.

[2] The number of pregnancies expected, minus the number of pregnancies observed, divided by the number of pregnancies expected, multiplied by 100.

point of view.[70] For example, the average married woman practicing contraception regularly during a reproductive period of around 25 years would experience four or five unplanned pregnancies if the method were water douche but a maximum of only one if it were diaphragm and jelly.[71] The rank order of the effectiveness of the various methods according to these ratios follows the pattern that has been observed above in the discussion of pregnancy rates. Table 24 presents the relative lack of protection afforded all "relatively fecund" couples by the use of the various methods "always"; Table 25 shows the net "inadequacies" of the different methods as actually used by the group.[72]

A condensed summary of the effectiveness of all contracep-

[70] For a similar criticism of this shortcoming of the conventional measure of effectiveness, *see* Tietze, Christopher; Guttmacher, Alan F.; and Rubin, Samuel: Time Required For Conception in 1,727 Planned Pregnancies. *Fertility and Sterility*, July, 1950, 1, No. 4, p. 341.

[71] Allowance has been made for gestation, puerperium, and lactation. The estimate, nevertheless, is crude and should be regarded only as an illustration of the point in question.

[72] The rank order of methods ranked according to effectiveness is essentially the same for the "relatively fecund" couples as for "all couples," the coefficient of correlation being +.99.

tion for the Indianapolis couples classified according to fecundity and regularity status is shown in Table 26 where the original effectiveness ratios are reproduced. The bottom section of this table shows the effectiveness of all methods of contraception *as practiced* in the population.

The Interrelation of Effectiveness and Acceptability

As stated in a previous section,[73] a contraceptive method is effective *only if it is used*; the factors that govern its use or non-use may be theoretically quite diverse in nature. For all intents and purposes, however, it is clear that the chief consideration in using a particular method, rather than another, was the feeling on the part of the couple that the method was reliable. On the basis of this information, a high, positive correlation should be expected between methods used because they are "reliable" and the actual or observed effectiveness of these methods. The coefficient of correlation obtained is +.66.[74] Additional evidence to support this relationship is the coefficient of –.85 between methods which were abandoned because they were felt to be "unreliable" and the observed effectiveness of these methods.

With an empirical profile of the effectiveness of the various methods it is now possible to examine more closely the extent to which couples tend to gravitate, over a period of years, from

[73] *See* discussion of reasons for use and change of method.

[74] This coefficient, and those which follow in this discussion, were obtained by the rank-order correlation technique. The twenty-two methods were ranked in accord with (in this instance) the proportion of "all couples" ever using the method who used it because they felt it was reliable and the rank-order effectiveness of these methods based on the effectivenss ratios of the various methods for all pregnancies, as used by "all couples" ever using contraception who used it "always," "usually," or "sometimes." Before the method of rank-order correlation was finally adopted, some experimentation was done with other alternative techniques, for example, the conventional product-moment formula used with the actual values of the percentages and, where applicable, based upon the transformation of percentages to angles according to the angular transformation table reproduced in Snedecor, George W.: Statistical Methods. Ames, Iowa, The Iowa State College Press, Fourth Printing, 1950, pp. 449–450. The results of these various procedures produced only negligible changes in the values of the coefficients (slightly higher than those resulting from the rank-order method) which were not considered sufficiently different to warrant their presentation.

Confidence in these coefficients requires a coefficient of at least .42 at the 5 per cent level of significance and at least .54 at the 1 per cent level. *Ibid.*, p. 149.

Effectiveness[2] of Methods Used First	Number of Couples	Effectiveness[2] of Methods Used "Last"				
		Total	Very Effective	Effective	Ineffective	Very Ineffective
Very Effective	319	100.1	*81.2*	4.4	8.5	6.0
Effective	127	100.0	17.3	*74.8*	2.4	5.5
Ineffective	309	100.0	33.0	13.6	*48.2*	5.2
Very Ineffective	327	99.9	38.5	11.3	11.6	*38.5*

Table 27. Percentage distribution of methods of contraception used first by methods used "last" in relation to the effectiveness of the methods, for "relatively fecund" couples.[1]

[1] Only couples whose first and "last" methods were known and appeared among the twenty-two methods coded are presented here.

[2] The criteria for these classifications for both first and "last" methods used are the ineffectiveness ratios for "relatively fecund" couples (all pregnancies) which appear in Table 25. The intervals are as follows: "Very Effective," under 6 per cent; "Effective," 6 to 9.9 per cent; "Ineffective," 10 to 13.9 per cent; and "Very Ineffective," 14 per cent or over.

the use of less effective to the use of more effective methods of contraception. Since the methods being used "last" by the couples (i.e., the last method used before the couples were interviewed) is the best available net index of acceptability, the correlations between methods used first and effectiveness, and methods used "last" and effectiveness, are of direct relevance. These correlation coefficients are –.57 and +.82, respectively;[75] they indicate a distinct tendency to use less effective methods at the beginning of contraceptive practice and to change to more effective methods during the 12 to 15 years of married life covered by this study. In other words, in so far as "acceptability" is reflected in the "last" method used, its merging with "effectiveness" appears to be very high.

Since correlation coefficients do not relate in detail the relationship between change in method and effectiveness, the twenty-two methods have been grouped into four categories according to their observed effectiveness in order to present some of this detail. From Table 27, the extent of the change from ineffective to effective methods can be seen.[76] The per-

[75] *See* Table 13 for the actual proportions that were ranked by method.

[76] This is not to deny the possibility of changes in method *between* the first and "last" methods. Some appreciation of these intermediate changes can be gained from Table 13. The data in Tables 27–28 apply only to "relatively fecund" couples (*see* footnotes to Table 27), for whom the necessity to secure an effective method is a more pressing consideration than for couples having some history of sterility.

Effectiveness[2] of the Methods	Methods Used First	Methods Used "Last"	Absolute Change	Relative Change
Number of Couples, Total	1,082	1,082		
Per Cent, Total	100.0	100.0		
Very Effective	29.5	47.0	+17.5	+59.3
Effective	11.7	17.4	+ 5.7	+48.7
Ineffective	28.6	20.1	− 8.5	−29.7
Very Ineffective	30.2	15.5	−14.7	−48.7

Table 28. Percentage distribution of "relatively fecund" couples[1] by effectiveness of method of contraception used first and "last" and changes in these distributions.

[1] *See* Table 27, footnote 1.
[2] *See* Table 27, footnote 2.

centages on the diagonal line (in italics) represent the proportion of couples whose "last" method was in the same class of effectiveness as their first method. It is apparent that the last method used by the highest proportion of couples is in the same category of effectiveness as the first method used.[77] However, there is a definite downward trend in these proportions with decreasing effectiveness. Thus, while 81 per cent of the couples using "very effective" methods at the beginning were using "very effective" methods at the interview, less than 39 per cent of the couples beginning with "very ineffective" methods were using these same methods at the time the study was made. In fact, an equal percentage had turned to "very effective" methods. In Table 28, a comparison of the net change in the use of methods varying in effectiveness is presented. It is readily apparent that there was a substantial increase[78] in the use of more effective methods during the period of years under consideration. On the other hand, it is significant that over 35 per cent of this group were still using comparatively ineffective contraceptive methods at the end of this period.

Summary

This study is based on an analysis of the pregnancy and contraceptive histories which were recorded in the Indianapolis

[77] The percentage is the same as that for the "very ineffective" category.
[78] Statistically significant at the 1 per cent level.

Study. Unlike many of the previous reports in this series, it does not relate to a specific hypothesis but rather to the practice of contraception in a modern American city. Attention is focused particularly on the effectiveness and acceptability of a number of different contraceptive methods. Analysis of the data in terms of economic status elucidates more fully some of the factors underlying group differences in fertility. The following observations, although varying in their degree of substantiation, can be stated as the main findings of this study.

(a) There appears to be no systematic relationship between fecundity and economic class. There are, however, wide variations in the noncontraceptive pregnancy rates, in this study and in some other studies, which seem to indicate conclusively that more statistical research in this biological area is necessary.

(b) In the period of exposure to the risk of conception before the first pregnancy there is a direct relation between economic class and the proportion of the period covered by contraceptive practice. After the first pregnancy there is no relationship between the two at all. Because of the greater statistical weight of the "after first pregnancy" exposure, this lack of relationship persists for the total period of all exposure. There is definite evidence, however, of an inverse association between economic class and the regularity of use.

(c) Pregnancy rates during periods when contraception is practiced vary inversely with economic class.

(d)This variation is due primarily to the differential use of methods of contraception which themselves vary in effectiveness but also to the differential proficiency with which any method is used. This observation should not be interpreted as an explanation of all differential fertility in the United States, however, because of the limits imposed in the sample design on the socio-economic and other characteristics of the respondents.

(e) Condom and some kind of douche used separately or together account for approximately 72 per cent of all exposure

with contraception for the total group studied. Diaphragm and jelly, which accounts for about 7 per cent of all contraceptive exposure, tends to be used later in the marriage period than condom and douche. There is a definite increase in the use of more effective methods over the marriage period, although over 35 per cent of the couples were using comparatively ineffective methods after 12 to 15 years of marriage.

(f) The belief that a method offered "reliability" is the chief reason both for using a method and for changing from one method to another.

(g) For "relatively fecund" couples using contraception "always," contraception in general is 92 per cent effective from the point of view of the reduction in uncontrolled fertility.

(h) Individual methods of contraception vary widely in their effectiveness. They range from the highly effective methods of diaphragm and jelly, condom, and condom combined with douche to the least effective methods of the safe period, suppository, and douches. These differences support, in general, the results of previous studies on this subject.

Appendix I

Table 29. Number of years of exposure[1] with different methods of contraception when contraception was practiced "always," for "relatively fecund" couples by income, and for "relatively sterile" couples.

Method of Contraception[2]	"Relatively Fecund"						"Relatively Sterile"	
	Before First Pregnancy			After First Pregnancy			Before First Pregnancy	After First Pregnancy
	Income of Couple			Income of Couple				
	High	Medium	Low	High	Medium	Low		
All Methods, Total	1,156	1,331	587	1,550	3,497	3,734	552	755
Douches, All Kinds Used Singly	*385*	*469*	*292*	*235*	*968*	*1,166*	*300*	*319*
Douche, Water	106	93	104	51	210	303	96	72
Douche, Lysol	47	119	78	56	242	331	26	13
Douche, Salt and/or Soda	31	45	21	26	149	134	51	36
Douche, Zonite	67	58	0	31	67	13	29	1
Douche, Other	134	154	89	71	300	385	98	197
Condom	218	306	104	342	823	746	107	165
Withdrawal	75	27	28	76	92	226	8	21
Diaphragm and Jelly	57	49	0	222	306	308	4	34
Suppository	1	27	32	69	110	165	16	35
Jelly	6	0	0	83	38	20	0	0
Safe Period	24	10	18	22	17	15	2	11
Condom and Water Douche	53	49	3	103	189	120	21	5
Condom and Lysol Douche	9	6	*	72	148	35	0	0
Condom and Other Douche	65	118	18	39	173	113	0	51
Withdrawal and Douche	12	40	29	46	94	64	3	29
Diaphragm, Jelly, and Douche	3	0	0	20	42	18	0	0
Suppository and Douche	33	48	2	25	91	57	19	4
Safe Period and Douche	13	3	7	10	61	32	0	2
Condom or Douche	55	64	10	86	113	243	42	6
Condom or Douche, or Condom and Douche	31	16	36	35	98	120	30	26
Condom or Withdrawal	82	73	4	59	96	173	0	7
Withdrawal or Douche, or Withdrawal and Douche	34	26	4	6	38	113	0	40

* Less than 6 months of exposure.
[1] These figures have been rounded off to the nearest year.
[2] See Table 5, footnotes 2–9.

Table 30. Number of conceptions with different methods of contraception when contraception was practiced "always" for "relatively fecund" couples by income, and for "relatively sterile" couples.[1]

Method of Contraception	"Relatively Fecund"						"Relatively Sterile"	
	Before First Pregnancy			After First Pregnancy				
	Income of Couple			Income of Couple			Before First Pregnancy	After First Pregnancy
	High	Medium	Low	High	Medium	Low		
All Methods, Total	75	132	151	100	251	498	50	38
Douches, All Kinds Used Singly	*51*	*88*	*105*	*42*	*113*	*228*	*39*	*11*
Douche, Water	14	25	30	20	31	68	4	1
Douche, Lysol	14	27	28	8	33	71	10	4
Douche, Salt and/or Soda	4	5	17	2	3	39	4	1
Douche, Zonite	2	9	—	2	8	1	2	1
Douche, Other	17	22	30	10	38	49	19	4
Condom	7	13	10	18	45	39	2	3
Withdrawal	1	0	8	3	6	14	0	0
Diaphragm and Jelly	0	1	—	6	8	20	0	6
Suppository	0	1	6	2	12	38	2	1
Jelly	2	—	—	2	9	1	—	—
Safe Period	4	0	3	4	5	10	0	0
Condom and Water Douche	2	3	1	3	8	15	0	0
Condom and Lysol Douche	0	1	1	0	2	9	—	—
Condom and Other Douche	0	2	1	3	6	5	—	0
Withdrawal and Douche	0	3	0	2	4	6	0	2
Diaphragm, Jelly, and Douche	0	—	—	0	2	2	—	—
Suppository and Douche	0	5	2	2	6	20	2	0
Safe Period and Douche	2	0	0	1	1	3	—	0
Condom or Douche	1	10	3	4	8	45	1	1
Condom or Douche, or Condom and Douche	2	2	6	3	5	5	4	2
Condom or Withdrawal	0	0	2	2	3	21	—	0
Withdrawal or Douche, or Withdrawal and Douche	3	3	3	3	8	17	—	12

— No exposure

[1] *See* Table 5, footnotes 2–9.

Table 31. Number of years of exposure[1] with different methods of contraception when contraception was practiced "usually" or "sometimes," for "relatively fecund" couples by income, and for "relatively sterile" couples.

Method of Contraception[2]	"Relatively Fecund"						"Relatively Sterile"	
	Before First Pregnancy			After First Pregnancy				
	Income of Couple			Income of Couple			Before First Pregnancy	After First Pregnancy
	High	Medium	Low	High	Medium	Low		
All Methods, Total	56	129	85	58	203	306	215	231
Douches, All Kinds Used Singly	*35*	*69*	*61*	*13*	*71*	*106*	*180*	*112*
Douche, Water	15	11	17	0	8	7	55	34
Douche, Lysol	13	17	9	5	13	27	14	16
Douche, Salt and/or Soda	0	4	2	0	0	32	24	20
Douche, Zonite	1	2	*	5	12	*	6	0
Douche, Other	6	35	33	3	38	40	81	42
Condom	14	33	17	13	50	39	4	53
Withdrawal	0	1	1	0	3	17	6	3
Diaphragm and Jelly	0	0	0	4	0	25	0	0
Suppository	0	2	0	0	2	35	1	13
Jelly	0	0	0	10	1	0	0	27
Safe Period	0	0	0	0	1	0	0	16
Condom and Water Douche	0	1	*	*	0	1	0	2
Condom and Lysol Douche	0	*	0	0	0	1	*	0
Condom and Other Douche	0	0	0	0	0	1	4	0
Withdrawal and Douche	0	0	0	0	1	0	0	0
Diaphragm, Jelly, and Douche	0	0	0	0	20	0	0	0
Suppository and Douche	0	0	1	0	24	3	0	5
Safe Period and Douche	0	*	0	0	0	0	0	0
Condom or Douche	3	0	*	6	19	35	20	0
Condom or Douche, or Condom and Douche	0	4	0	0	0	16	0	0
Condom or Withdrawal	3	0	*	0	11	19	0	0
Withdrawal or Douche, or Withdrawal and Douche	1	19	5	12	*	8	0	0

* Less than six months of exposure.
[1] These figures have been rounded off to the nearest year.
[2] *See* Table 5, footnotes 2–9.

Table 32. Number of conceptions with different methods of contraception when contraception was practiced "usually" or "sometimes," for "relatively fecund" couples by income, and for "relatively sterile" couples.[1]

Method of Contraception	"Relatively Fecund"						"Relatively Sterile"	
	Before First Pregnancy			After First Pregnancy				
	Income of Couple			Income of Couple			Before First Pregnancy	After First Pregnancy
	High	Medium	Low	High	Medium	Low		
All Methods, Total	29	57	59	22	66	127	33	50
Douches, All Kinds Used Singly	*23*	*39*	*36*	*4*	*29*	*57*	*28*	*15*
Douche, Water	6	12	15	—	7	5	10	5
Douche, Lysol	5	7	10	0	8	28	10	5
Douche, Salt and/or Soda	—	6	2	—	—	6	2	4
Douche, Zonite	6	6	1	2	2	1	0	—
Douche, Other	6	8	8	2	12	17	6	1
Condom	2	4	9	7	11	18	4	24
Withdrawal	—	2	1	—	7	11	0	10
Diaphragm and Jelly	—	—	—	2	—	2	—	—
Suppository	—	3	—	—	5	3	0	0
Jelly	—	—	—	2	1	—	—	0
Safe Period	—	—	—	—	2	—	—	1
Condom and Water Douche	—	2	1	3	—	1	—	0
Condom and Lysol Douche	—	2	—	—	—	1	1	—
Condom and Other Douche	—	—	—	—	—	1	0	—
Withdrawal and Douche	—	—	—	—	1	—	—	—
Diaphragm, Jelly, and Douche	—	—	—	—	4	—	—	—
Suppository and Douche	—	—	3	—	1	3	—	0
Safe Period and Douche	—	1	—	—	—	—	—	—
Condom or Douche	2	—	3	3	1	11	0	—
Condom or Douche, or Condom and Douche	—	2	—	—	—	7	—	—
Condom or Withdrawal	2	—	1	—	3	8	—	—
Withdrawal or Douche, or Withdrawal and Douche	0	2	5	1	1	4	—	—

— No exposure.
[1] *See* Table 5, footnotes 2–9.

Appendix II

A NOTE ON THE CONCEPT OF THE "EFFECTIVENESS RATIO"

A basic theoretical problem involved in the concept of the effectiveness ratio relates to the type of noncontraceptive pregnancy rate to be selected for a standard. The effectiveness ratio purports to measure the reduction in risk below the level expected *when no contraception is used.* As indicated in the text, however, there are several types of noncontraceptive exposure. The choices actually available in this study are based on (1) exposure before the first use of contraception; (2) exposure following the interruption of contraception for purpose of conception; or, (3) both (1) and (2). For reasons that will become clear in the following discussion, the real choice lies between (1) and (3).[79]

The accepted procedure in the past has been to rely upon exposure before the first use of contraception. The fact that previous investigators have never seriously raised the question of combining temporary noncontraceptive exposure with the more "habitual"[80] type is more readily understandable in view of the fact that most former studies of contraception and fertility were restricted to birth-control clinic populations where the planned pregnancy was a very infrequent occurrence.

To facilitate the following discussion, let the abbreviation BC (before contraception) signify exposure before the first use of contraception, and IC (interrupted contraception) for exposure after contraception has been interrupted in order to have a child. The total BC + IC would then stand for all noncontraceptive exposure.

Although the authors of this present study utilized the BC exposure rate as the standard for computing "expected" pregnancies, the decision is not completely satisfactory. For some time the desirability of using the BC + IC pregnancy rate as a noncontraceptive

[79] As stated in the text there is logically another type of noncontraceptive exposure, namely, exposure following the interruption of contraception for purposes other than to conceive. This exposure, however, is statistically negligible in this study, and as far as can be determined, has been also insignificant in previous studies. Nevertheless, it should be included, when present, in a standard of total noncontraceptive exposure. For purposes of simplification, this type of exposure is ignored in this discussion.

[80] Stix and Notestein's terminology.

standard was discussed, since it has several features to recommend its use over the BC rate alone. First, it does represent the actual total noncontraceptive experience of the group. This consideration assumes greater importance when it is recalled that the pregnancy rates for the two types of exposure differ significantly and widely (*see* Table 3). It may be that the combined rate more adequately reflects the "true" reproductive capacity of the group.

A second consideration which warrants attention is the possibility that couples who do not adopt contraception until late in marriage or who never adopt it, and hence who contribute heavily to BC exposure, are less fecund than couples who start practicing contraception early in marriage and who, when they want a child, are able to conceive on an average of every 4.5 exposure-months. The corresponding average number of exposure-months per conception for couples during BC exposure is 8.0 months, a period almost twice as long.[81] These problems, which recur repeatedly in studies of this nature,[82] simply reiterate the necessity of detailed statistical research on the subject of chance of conception in the absence of contraception during different periods of married life, in different pregnancy intervals, and with differences in motivation.

A third possible advantage that the combined BC + IC standard may have over the simple BC standard, is that BC exposure is related inversely, and IC exposure is related directly, to economic status. (*See* Table 1.) If it could be asserted unequivocally that fecundity is completely unrelated to socio-economic status, this would present no problem. Although the data in this and many of the previous studies show no systematic group relationships, there are statistically significant variations in noncontraceptive pregnancy rates among the classes[83] which have not yet been explained adequately. Consequently, the possible neutralization of these opposing relationships in a combined rate deserves at least preliminary consideration in any study.

[81] These averages are for "all pregnancies" for "relatively fecund" couples. The averages by pregnancy order are: first pregnancy, BC—6.1, IC—3.8; for later pregnancies, BC—11.9, IC—5.1.

[82] For an emphasis of this criterion, *see* Tietze, Guttmacher, and Rubin: Time Required for Conception in 1,727 Planned Pregnancies. *Op. cit.*, p. 341.

[83] The fact that "class" has been measured operationally in the study by income groupings instead of by a more sophisticated sociological criterion which would reflect more accurately the vast network of differences in ways of life and differential value-systems, further complicates any inferences of "class" variations in fecundity.

In spite of these considerations, which argue strongly for a combined standard, it was decided in this study to compute the "expected pregnancies" factor on the basis of the simple BC rate. Several reasons for this decision can be enumerated. The primary reason is that this procedure was followed in previous studies; hence its use here facilitates comparisons.

Another consideration, alluded to briefly above, is that since postpartum amenorrhea and lactation are normal processes they should affect in some degree the risk of conception after the first pregnancy, instead of being minimized as they would be if the combined standard were employed.

Regardless of the type of standard adopted there is always the problem of estimating for the couples who practiced contraception the pregnancy history which they would have had in the absence of contraceptive practices. This problem is especially serious in studies of urban populations like the present where noncontraceptive experience of the BC exposure-type accounts for only 2.8 per cent of the total exposure of "relatively fecund" couples. (*See* Table 1.) It is considerably less serious in birth-control clinic populations where many of the couples coming to the clinic for contraceptive advice have had much BC exposure.

It is perhaps ironic that these various theoretical considerations are reflected so little in the actual percentage values of the effectiveness ratios. The following illustration, among other things, serves to underscore the insensitive nature of these ratios. Assume that the choice is between a BC rate of 200, and a BC + IC rate of 300. Given the contraceptive pregnancy rates of 5 for Method A, 10 for Method B, and 25 for Method C, the effectiveness ratios would be as follows:

	Ratio Based on BC Standard	Ratio Based on BC + IC Standard
Method A	98	98
Method B	95	97
Method C	88	92

The differences between the ratios for the two standards are not very impressive particularly in view of the relative differences between the two noncontraceptive rates and between the three rates

for the different methods. This insensitivity of the effectiveness ratio is particularly apparent where the contraceptive rates are low and the noncontraceptive rates are very high. Furthermore, a moment's reflection will show that the rank-order relationship of the different methods remains identical regardless of which noncontraceptive standard is chosen.

In conclusion, it is our opinion that although the effectiveness ratio to some extent portrays accurately the over-all reduction in the risk of conception[84] from an abstract demographic point of view, it is so beset with conceptual and perceptual difficulties that its use in comparisons of the effectiveness of different methods, particularly if the data are to be evaluated from a personal point of view, is seriously open to question.

[84] An advantage of the effectiveness ratio is that it provides a better basis than pregnancy rates for comparison of the effectiveness of various methods as shown in different studies. A direct comparison of pregnancy rates for a given method as shown in different studies will only be valid if the fecundity of the two populations is the same. There are reasons for believing, however, that the fecundity of birth-control clinic populations is higher than that of a "normal" population. For example, the Stix and Notestein study reveals BC rates of 271 and 105 for first and subsequent pregnancies and IC rates of 444 and 331 (*op. cit.*, p. 184) compared to the corresponding rates of 195 and 101, and 314 and 236 for the "relatively fecund" couples in the Indianapolis Study. The rates for "all couples" in the Indianapolis Study are much lower (36 and 41 for BC exposures, 59 and 98 for IC exposure) because couples with varying degrees of sterility are included. Thus, the effectiveness ratio serves to standardize pregnancy rates for differences in fecundity and to increase comparability.

It should be recognized that the effectiveness ratios that appear in this study are quite different conceptually from the ratios previously computed by Whelpton and Kiser, *op. cit.*, VI. The Planning of Fertility, pp. 103–107 (Reprint pp. 249–253); and *op. cit.*, VIII. The Comparative Influence on Fertility of Contraception and Impairments of Fecundity, pp. 182–236 (Reprint pp. 303–357). The major difference between the Whelpton and Kiser ratios and those in this article are that the former measure the "observed" factor in terms of the actual number of pregnancies and live births that occurred regardless of whether they were planned or unplanned and thus constitute an estimate of the reduction in group fertility due to attempts to plan births but a reduction in which noncontraceptive fertility is allowed for. Our ratios, on the other hand, are only concerned with the reduction in fertility that occurs as measured against the number of pregnancies conceived unintentionally while contraception was practiced and does not include noncontraceptive conceptions in the "observed" factor. This accounts for the lower ratios of Whelpton and Kiser, averaging around 70 per cent, compared to those in this study of around 90 per cent (*see* Table 26).