Legal Abortions, Socioeconomic Status, and Measured Intelligence in the United States

Joel E. Cohen

Society of Fellows
Harvard University
Cambridge, Massachusetts

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A pregnant woman's socioeconomic status influences the likelihood of her receiving a legal or therapeutic[1] abortion in the United States, according to recent evidence. The purpose of this paper is to estimate the selection, in the sense of population genetics, against greater measured intelligence due to the recent practice of therapeutic abortions in the United States.

Unless otherwise specified, all abortions discussed will be legal or therapeutic. How this restriction to legal abortions limits the importance of the conclusions will be discussed below.

The argument depends on the association of frequency[2] of abortion with socioeconomic status and the association of socioeconomic status with measured intelligence. Heroic assumptions permit construction of an association between frequency of abortions and measured intelligence. If the frequencies of abortions are interpreted as changes in the fertilities of groups with different mean measured intelligence, then observations of the fertilities of groups with different mean measured intelligence permit an estimate of the selection against greater measured intelligence due to abortions.

SOCIOECONOMIC STATUS AND FREQUENCY OF LEGAL ABORTION

"One of the major gaps in national data on factors influencing infant and perinatal mortality relates to socioeconomic status" (Shapiro, Schlesinger, and Nesbitt, 1968, p. 64). Four recent papers, providing the best available data on socioeconomic status and legal abortion, confirm Shapiro's assertion.

[1] An abortion, the premature expulsion from the uterus of the products of conception, may be classified as: spontaneous, not due to known intervention; illegally induced, produced by artificial means under circumstances contrary to the laws of the state where the abortion occurs; and legally induced (also called therapeutic), produced by artificial means not contrary to state laws. A table summarizing United States abortion laws by state as of 31 March 1970 is given by Ross (1970).

[2] For each of the three types of abortion, there are at least ten measures of incidence: (1) number of abortions per 1,000 live births; (2) number of abortions per 1,000 conceptions or pregnancies; (3) number of women who have had an abortion per 1,000 women who have passed the fertile age; (4) number of abortions had by 1,000 women who have passed the fertile age (taking account of multiple abortions); (5) number of women who have had an abortion per 1,000 women of childbearing age (aged 16 to 45, say) in some age distribution; (6) number of abortions per 1,000 women of childbearing age in some age distribution; (7) number of women past the fertile age who have had an abortion per 1,000 of the general population; (8) number of abortions had by women past the fertile age per 1,000 of the general population; (9) number of women of fertile age (in some age distribution) who have had an abortion per 1,000 of the general population; (10) number of abortions had by women of fertile age per 1,000 of the general population.

Reviewing therapeutic abortions in New York City from 1943 to 1962, Gold et al. (1965) showed that in 1960–62, when there was an overall abortion ratio of 1.8 abortions per 1,000 live births, the abortion ratios among whites (excluding Puerto Ricans), nonwhites, and Puerto Ricans were 2.6, 0.5, and 0.1 abortions per 1,000 live births, respectively. These abortions were delivered in four types of services, presumably ranging from high to low cost and from high to low social status of patients. The numbers of abortions per 1,000 live births by the type of care were: in proprietary hospitals, 3.9; in the private service of voluntary hospitals, 2.4; in the general service of voluntary hospitals, 0.7; in municipal hospitals, 0.1. Unfortunately, Gold et al. do not give information about the income, education, or occupation of the patients seen in these types of care. Neither do the following papers.

Hall (1965) found that the ratio of therapeutic abortions to deliveries among private patients at the Sloane Hospital for Women in New York was 1:37, and among ward patients, 1:141, during the period 1950–55. During this time, permission to perform an abortion required approval of the Chief of Service. At the end of 1955, a Therapeutic Abortion Board consisting of a senior obstetrician, internist, and psychiatrist was formed to review applications for abortion. From 1956 through 1960, the ratio of abortions to deliveries among private patients was 1:111, while the ratio among ward patients was 1:429. Thus, the formation of the Therapeutic Abortion Board greatly reduced the overall incidence of abortions without substantially affecting the differences in the delivery of abortions to ward and private patients.

From 60 responses to a survey of "65 randomly selected major hospitals, requesting the number of ward and private deliveries and therapeutic abortions performed on their services during any recent year or years," Hall found a ratio of abortions to deliveries among private patients of 1:315, and among ward patients of 1:1,149.

Among possible explanations for the difference in incidence of abortions between ward and private services, Hall (1965, p. 519) noted the

> tendency of the ward patients to register for antepartum care later in their pregnancies and to be less aware of their need to be aborted [and the] higher incidence of abortions for psychiatric indications among private patients.

Detailed analysis of the indications for abortion suggested to Hall that these reasons were

> far from the complete explanation . . . abortions were more common among the private patients at Sloan Hospital for virtually all of the more debatable indications . . . and more common among the ward patients for most of the less debatable indications (p. 522).

Hall's conclusion of "greater liberality in the private abortion practice" seems consistent with the greater economic means and willingness to pay for services of private patients.

Hall (1967) reported a survey of 69% of New York State's 394 hospitals. He found the ratio of abortions to deliveries during 1965 to be 1:266 at proprietary hospitals, 1:317 at voluntary hospitals, and 1:989 at public hospitals.

Tietze (1968, p. 784) obtained tabulations "from the Commission on Professional and Hospital Activities in Ann Arbor for all short-term general hospitals participating in the Professional Activities Survey (P.A.S.) in 1963, 1964, and 1965." Excluding Catholic hospitals, he found 2.0 abortions per thousand deliveries among white patients and 1.1 abortions per thousand deliveries among nonwhite.

SOCIOECONOMIC STATUS AND MEASURED INTELLIGENCE

Income or prestige of occupation and length of education are positively related

to measured intelligence. Whether this relation is due to the instruments of measurement themselves is a question we explicitly set aside.

Cattell (1938, p. 175) measured the average IQ's of adults in various occupational classes and of the children of the adults in those classes. The higher the occupational level as measured by income or some estimates of status, the higher the average IQ. The IQ's of children of adults in these categories exhibited the statistically predictable regression toward the mean and maintained the same general rank ordering.

Cronbach (as quoted in Berelson and Steiner, 1964, p. 211) showed that the higher the level of education and of occupation, the higher the level of average IQ.

Bajema (1966, p. 308; 1968, p. 199) confirmed the relation between mean IQ and educational attainment for both men and women and the relation between occupational class of men and mean IQ. Unlike Cattell's measurements of IQ, Bajema's were made when the individuals were 11 years old, some 35 years before the occupation was determined. Bajema's conclusions are based on the same population which provided the fertility figures below.

MEASURED INTELLIGENCE AND FERTILITY

Anastasi (1956, p. 195) reviewed a study of fairly well-educated New England couples and found that the

> correlation between initial Otis Intelligence Test scores and subsequent number of live births was .19 for the 216 men and .17 for the 216 women, both being significant at approximately the .01 level. . . . It is noteworthy that none of the studies in which parental intelligence was correlated with number of offspring has so far yielded the negative correlation customarily found when child intelligence is correlated with size of sibship.

Two recent studies confirm the positive correlation between measured intelligence and fertility.[3] Higgins, Reed, and Reed (1962) analyzed the fertility of some Minnesotans for whom school intelligence-test scores could be discovered (Table 1). Carter (1966, p. 195) summarizes their results:

> . . . including only the individuals who had married, they found overall a negative correlation of intelligence and family size. The very bright and the moderately bright individuals had larger families than the average, but the dull and very dull had an even greater excess of children. However, if one included the unmarried members of the family, this negative correlation disappeared and there was a positive relationship of intelligence and family size.

TABLE 1

FERTILITY AND MEASURED INTELLIGENCE IN MINNESOTA AND ASSIGNED ABORTION RATIOS AND ADJUSTED FERTILITY*

IQ	N	Fertility	Abortion Ratio	Adjusted Fertility
136.....	25	2.96	3.9	2.972
123.....	269	2.45	3.9	2.460
108.....	778	2.26	2.4	2.265
93.....	583	2.16	0.7	2.162
78.....	208	2.39	0.1	2.390
63.....	74	2.46	0.1	2.460
49.....	29	1.38	0.1	1.380
Average Figures				
100.....	1,966	2.27 $S=0.529$	...	2.278 $S'=0.549$

SOURCE: Higgins, Reed, and Reed, 1962, as quoted in Carter, 1966.

* IQ is the assumed average intelligence quotient of individuals in the class, usually calculated as the mean of the end-points of the interval of IQ's included in the class. N is the number of individuals in each IQ class. Fertility is the mean fertility of individuals in each IQ class, usually the number per person of offspring surviving beyond age one. Abortion ratio is the number of abortions per thousand live births assigned to each IQ class. Adjusted fertility is the fertility which would be observed if the true fertility of each IQ class were multiplied by (1 + abortion ratio/1,000). S and S' are the apparent selection differentials.

[3] The 1960 census study of women by number of children ever born shows that, among those women who reproduced at all, the poorly educated women and women whose husbands had lower incomes were having more children. This observation neglects the fraction of women who failed to reproduce, whether because of mortality, failure to marry, infertility, or voluntary restraint, and totally overlooks the fertility of males, which can differ, by educational attainment, from that of females (Bajema, 1966, p. 312). "It is absolutely essential that estimates of genetic trends be based on populations which include nonreproductive individuals" (Bajema, 1968, p. 201).

Bajema (1963) traced over 85% of the white native-born men and women born between 1916 and 1917 who had attended the sixth grade in the public schools of Kalamazoo County, Michigan. Individuals' IQ scores and the number of siblings in the families from which they came correlated −0.26, as Anastasi (1956) had found in previous studies. However, individuals' IQ scores had a small positive correlation, 0.05, with their completed fertility subsequent to the IQ test. As in the study of Higgins et al. (1962), the very bright and the moderately dull were most fertile, the average group considerably less so, and the lowest scorers the least fertile (Table 2).

APPARENT SELECTION FOR MEASURED INTELLIGENCE

From the data in Tables 1 and 2, Falconer (1966) estimated the apparent selection differential of measured intelligence. The selection differential is qualified as "apparent" because the measurement of selection is based on an apparent, or phenotypic, character of individuals and not directly on some genetic character (Falconer, 1960, p. 165–192). From other evidence on the heritability of measured intelligence, Falconer (1966, p. 230) estimates the expected genetic change of measured intelligence per generation to be about 40% of the apparent selection differential. All selection differentials mentioned below will be "apparent," and should be multiplied by 0.4 to find the mean genetic change per generation.

> The selection differential, S, is the mean superiority of the individuals selected, over the mean of the generation to which they belong, and is a measure of the intensity of the selection applied. . . . The superiority of each selected individual is weighted by its relative contribution to the next generation, and the selection differential is the weighted mean superiority. Thus
>
> $$S = \frac{1}{N} \Sigma \frac{f}{\bar{f}}(X - \bar{X})$$
>
> where X is the value of the character in a selected individual [measured intelligence, in this case], f is the number of offspring it contributes to the next generation [commonly called "fitness"], $\bar{f}$ and $\bar{X}$ the means of f and X in the population, and N is the number of selected individuals (Falconer, 1966, p. 220–221).

When the individuals are grouped as in Tables 1 and 2, X_i becomes the mean value of measured intelligence in the ith group and N_i the number of individuals in the ith group. (The possible dangers of using grouped means are illustrated by Bajema, 1966, p. 314–315.) The selection differential becomes

$$S = \frac{1}{N} \sum_i \frac{N_i f_i}{\bar{f}} (X_i - \bar{X}) . \qquad (1)$$

The column "IQ" in Table 1 gives the mean values of measured intelligence (X_i) I assumed for the data of Higgins, Reed, and Reed (1962); the column "IQ" in Table 2 gives the mean values assumed by Falconer (1966) which I also used.

As his estimate of the fitness f_i of each group, Falconer took the fertility figures in Tables 1 and 2. I do likewise.[4]

TABLE 2

FERTILITY AND MEASURED INTELLIGENCE IN MICHIGAN AND ASSIGNED ABORTION RATIOS AND ADJUSTED FERTILITY*

IQ	N	Fertility	Abortion Ratio	Adjusted Fertility
136.....	23	3.00	3.9	3.012
125.....	59	2.44	3.9	2.450
112.....	282	2.24	2.4	2.245
100.....	318	2.02	0.7	2.021
87.....	267	2.46	0.1	2.460
74.....	30	1.50	0.1	1.500
Average Figures				
101.....	979	2.24 $S=0.340$	...	2.239 $S'=0.356$

SOURCE: Bajema, 1963.
* See note to Table 1.

[4] Carter (1966) labelled these fertility figures "Mean No. of Offspring." Falconer (1966, p. 230) labelled them "Fertility." Bajema (1963) explained that in his data they are the mean number of offspring who lived past the age of one; presumably the same applies to the data of Higgins et al. (1962).

Using equation (1), Falconer (1966) found a selection differential of 0.5 IQ units in the data of Higgins, Reed, and Reed (1962) and a selection differential of 0.3 IQ units in the data of Bajema (1963). These figures are confirmed by independent recalculation in Tables 1 and 2. Falconer (1960, 1966) does not offer a statistical test to show whether an estimate of S calculated from observations in fact differs significantly from zero. However, it can be proved that S equals the covariance between the fitness f_i and the character X_i, divided by the mean fitness $\bar{f}$. Hence, for given mean fitness and given variances in fitness and X_i, S is proportional to the correlation between f_i and X_i. Since the correlations between fertility and measured intelligence observed by Higgins, Reed, and Reed (1962) and Bajema (1963) were statistically significant, so also must be the selection differentials proportional to them.

THE EFFECT OF LEGAL ABORTIONS

If legal abortions were available to and used by each IQ class in proportion to its fertility as determined by all other means of control, then the relative fitness (but not absolute fertility) of each IQ class would be unaffected by the presence or absence of legal abortions, and the selection differential for measured intelligence would be similarly unaffected.

However, the evidence presented so far suggests that the higher IQ classes should have a higher legal-abortion ratio than the lower IQ classes. Four abortion ratios, those quoted from Gold et al. (1965), have been assigned to the IQ classes in such a way as to emphasize the difference in effect on fertility between high and low IQ classes: The highest abortion ratio was assigned to most of the high IQ classes and the lowest abortion ratio to most of the low IQ classes. The removal of these legal abortions, without replacing them by other means of fertility control, increases the apparent selection differential for measured intelligence by amounts between 0.016 and 0.020 IQ units per generation.[5]

These estimated increases in the apparent selection differential for measured intelligence exaggerate the actual selection differential against measured intelligence due to legal abortions for two reasons. First, the abortion ratios in Tables 1 and 2 were assigned to emphasize the gradient across IQ classes. Second, in family-planning programs, it is known that a newly introduced method of contraception may be substituted for older methods already in use, and hence that the extent of use of the new method may overstate the actual change in fertility due to the new method (Mauldin, 1968). Conversely, it seems likely here that if legal or therapeutic abortions were abolished, alternate ways of controlling fertility would

Bajema observed that the fitness of individuals depends not just on their fertility, but on their intrinsic rates of natural increase and their mean generation times, both of which depend on their life tables (which are assumed constant for them and their offspring). The dependence of infant (Shapiro et al., 1968, p. 65, Table 2.7) and adult (Dublin et al., 1949, p. 216, Table 52) mortality on socioeconomic status is well known, and hence probably also varies with measured intelligence. Bajema (1963) calculated separate life tables for each IQ class. From these he estimated a measure of fitness depending on the intrinsic rate of natural increase and the mean generation time. Converting this measure to a measure of relative fitness by assigning the most fit class a value of 1.00, he then compared this "true" measure of relative fitness with the estimate of relative fitness based solely on the fertility (Bajema, 1963, p. 181, Tables 7 and 8). For no IQ class do the two estimates of relative fitness differ by more than 0.01, and the rank order of classes is strictly preserved. Hence, fertility may be adopted as an excellent estimate of relative fitness.

[5] In the tables, the column headed "Adjusted Fertility" shows the adjusted fertility (f_i') of each IQ class i which would result if the ratio (r_i) of legal abortions assigned to it were suspended and no other means of contraception were substituted. Thus, if f_i is the observed fertility, $f_i' = f_i(1 + r_i/1{,}000)$. Since the higher IQ classes have been assigned a higher abortion ratio, their fertility without legal abortions would be increased more than proportionately. Beneath each column headed "Adjusted Fertility" is the apparent selection differential S' for measured intelligence which would result if the adjusted fertilities were substituted for the observed. The selection differential S based on the observed fertilities appears under the column headed "Fertility."

be substituted to some extent. For these reasons, the values estimated above approximate an upper bound on the increased selection differential for measured intelligence which would follow from equal use or the absence of legal abortions.

"PROJECTED" FERTILITY, MEASURED INTELLIGENCE, AND LEGAL ABORTION

Noting the bimodality in the distribution of fertility by IQ,[6] Carter (1966, p. 197) proposed that

> the second peak at IQ below 95 is due to this dull group still having a substantial proportion of unplanned and often unwanted children. The projected planned fertility for a series such as Bajema's . . . assumed the fertilities ... [see Table 2] to change to 2.9, 2.4, 2.0, 1.8, 1.6, and 1.0 in descending order of intelligence. We may reasonably expect these unplanned children to become progressively fewer, provided that the dull and the very dull group are given all necessary help to plan their families.

Using Carter's "projected" fertilities as shown in our Table 3, Falconer (1966) estimated an apparent selection differential of 2.1 IQ units, which I have confirmed as 2.071. If family planning is thus provided, and if it takes this "projected" effect, and if the means of fertility control is other than legal abortion, then the further removal of differentially available legal abortions would increase the apparent selection differential for measured intelligence by less than one per cent, which is a smaller percentage increase than those in Tables 1 and 2.

ILLEGAL ABORTIONS

Legal induced abortions in the United States are a tiny fraction of the illegal in-

[6] Cattell commented long ago (1938, p. 179): "Inspection of family size distributions suggests that there is already operative in this country [England] a tendency to restrict to a size planned appropriately to socio-economic conditions and this size is smaller in occupations of lower status. This tendency is completely expressed in the highest occupations but in lower occupations acts side by side with, without being totally obscured by, a tendency to completely haphazard reproduction, and this latter tendency dominates the lowest groups.

TABLE 3

FERTILITIES PROJECTED FOR MICHIGAN IF BIRTH CONTROL WERE AVAILABLE, AND ASSIGNED ABORTION RATIOS AND ADJUSTED FERTILITY*

IQ	N	Fertility (Projected)	Abortion Ratio	Adjusted Fertility
136.....	23	2.90	3.9	2.911
125.....	59	2.40	3.9	2.409
112.....	282	2.00	2.4	2.005
100.....	318	1.80	0.7	1.801
87.....	267	1.60	0.1	1.600
74.....	30	1.00	0.1	1.000
Average Figures				
101.....	979	1.84 $S=2.071$	...	1.843 $S'=2.088$

SOURCE: Carter, 1966.
* See note to Table 1.

duced abortions, and a still smaller fraction of the births prevented by spontaneous abortion and other means.[7] Hence, any selection due to legal abortion may well be swamped by contrary effects of other controls on fertility. At least two American studies suggest that the direction of the socioeconomic bias in the delivery of legal abortions is reversed for illegal induced abortions. A third study, which does not suffer from the methodological shortcomings

[7] Kosa et al. (1969, p. 271) guess one illegal abortion for every four births annually. They adopt the figure of a million illegal abortions a year from the range of 200,000 to 1,200,000 estimated in Calderone (1958, p. 178–180). Hence the 10,000 legal abortions annually estimated by Kosa et al. are about one per cent of the illegal. Hall (1967, p. 126) asserts that "about 100 abortions are thought to be performed outside hospitals for every one performed inside."

In their prospective interview study, Coombs et al. (1969, p. 251) found a fetal death rate of 160 per 1,000 completed pregnancies, which is equivalent to approximately 190 fetal deaths per 1,000 live births. In an analysis of prospective medical records, Shapiro and Abramowicz (1969, p. 1,633) found a fetal death rate of 153 per 1,000 pregnancies, which is equivalent to approximately 181 fetal deaths per 1,000 live births. Accepting that the figures of Gold et al. (1965) are relevant to the same population, their 1.8 legal abortions per 1,000 live births are thus about one per cent of fetal deaths. If this calculation is even approximately correct, then the guesses that there are 100 illegal abortions for every legal abortion are too high, since they allow nothing for fetal loss due to spontaneous abortion.

of these two, suggests that illegal induced abortions, like legal ones, may increase in frequency with socioeconomic status.

In a study of white women with better than average educations who were mostly from an urban population, Gebhard et al. (1958, p. 196) found 1,067 induced abortions of which 68 or 6.4% were legal. Among all pregnancies which ended while the women were married, women of all ages with zero to eight years of schooling had a higher percentage (22.1%) of induced abortion, and the women of all ages with some graduate work a lower percentage (15.4%) of induced abortion, than did the women with intermediate amounts of education (Gebhard et al., 1958, p. 139). Similarly, among ever-married females and considering only pregnancies ending during marriage, the number of induced abortions (112.2) ever experienced per hundred women aged 45 with zero to eight years of schooling was higher, and the number of induced abortions (33.1) ever experienced per hundred women aged 45 with some graduate work was lower, than the numbers per hundred women with intermediate amounts of education. These differences, mostly attributable to illegal abortions, are large enough to override any opposed trends in the distributions of legal abortions.

In an unpublished analysis of hospitalized obstetrical patients in New York recorded by the Obstetrical Statistical Cooperative Study between 1961 and 1964, Burnhill (1969) reported that 14,922 of 77,310 pregnancies ended in an abortion at less than 20 weeks of gestation. Among private patients the ratio of abortions to single pregnancies was 8.66%, whereas among ward patients the ratio was 26.22%. To Burnhill, "the over-all wide disparity in abortion ratios by age or parity between the private and ward patients suggests the widespread use of induced abortion in the latter group" (p. 6).

Gebhard et al. (1958) based their conclusions on retrospective histories which may be subject to considerable biases and omissions in reporting. Burnhill (1969) omitted all abortions out of hospital.

A third study avoided both of these weaknesses, and came to an opposite conclusion, by interviewing frequently and prospectively a random sample of white couples of proved fertility in Detroit. (Even this study neglects the fertility and abortions of the unmarried.) A history taken at the beginning of the series of interviews (Coombs et al., 1969, p. 254) showed that, retrospectively, higher-income couples ($9,000 or more per year) reported a fetal death rate of 91 per 1,000 pregnancies which is slightly lower than that of 105 per 1,000 pregnancies reported by lower-income couples. This is consistent with the retrospective findings of Gebhard et al. (1958). But prospectively, higher-income couples reported a fetal death rate of 172 per 1,000 pregnancies which was higher than that of 144 per 1,000 pregnancies reported by lower-income families. For both classes of families, prospective study greatly increased the reported fetal death rate.

Coombs et al. (1969, p. 253) point out that previous studies such as that of Hammoud (1965) which reported a negative correlation between fetal mortality and economic status neglected fetal losses before 20 weeks of gestation and hence excluded most induced abortions. After considering a variety of alternative explanations, Coombs et al. (1969, p. 254) propose as plausible the possibility that "high induced abortion rates contribute to the higher fetal mortality of the upper income groups."

Even the rates estimated in this study are subject to error because they omit any pregnancy which terminated before the woman was aware of it (pregnancy was determined strictly by interview). Nevertheless, this, the best study to date, suggests that the selective effect of illegal induced abortions may be in the same direction as that of legal abortions.

The most that can be concluded is that the contribution of legal induced abortions to observed patterns of fertility has been small in the United States and that other forms of fertility control have been resorted to when legal induced abortions were denied. Better information is lacking.

IMPLICATIONS FOR POLICY

The legal abortions studied here are an unknown but presumably small fraction of all induced abortions. As laws governing abortion (Ross, 1970) make the procedure increasingly available, that fraction will increase. The selection reported here may or may not continue to exist and may or may not increase in magnitude and importance. The primary policy implication of this study is that some system of reporting ought to be incorporated into the new laws governing induced abortion so that it will be possible to find out, promptly and efficiently, what the consequences of this new social policy are. If not on the grounds of research, such a requirement for reporting can be justified by the democratic desideratum of equal availability regardless of socioeconomic status.

It may well be that the consequences for the measured intelligence of the population of the distribution of induced abortions by socioeconomic status are far less important than other consequences of the distribution, such as the effects on income, welfare, and mental or physical health. The present study is not intended to slight these consequences, but to demonstrate how one genetic consequence of a social practice can be estimated.

In the same spirit, it must be recognized that a social policy which optimized the consequences for intelligence of the availability of induced abortions would not necessarily determine the use of induced abortions or necessarily be the same as a social policy which optimized the overall consequences of an abortion policy. The present study at least makes it possible to evaluate the consequences for measured intelligence of one abortion policy.

Under the assumptions of the calculations presented, the rigorous elimination of the differential use of legal abortions could increase the apparent selection differential for measured intelligence by at most 2 to 10%, according to Tables 1 and 2. On the other hand, according to the "projected" fertilities in Table 3, full provision and effective implementation of other means of fertility control for families who desire them could at least quadruple apparent selection for measured intelligence, and equal use of legal abortions could then increase that selection differential by less than one per cent. Under these circumstances, the ratio of effectiveness in increasing selection for measured intelligence of attaining the "projected" fertilities compared to equally distributing legal abortions is at least 40 (4 divided by 10%).

Thus, the following very limited kind of conclusion is possible. Assume, as a narrow program objective, a policy of increasing selection for measured intelligence which is to be pursued as cheaply as possible within humane constraints, ignoring all consequences other than those affecting measured intelligence. Assume a choice of program between equalizing usage of legal abortions at the same average incidence as at present, and between providing other means, for families who desire them, of controlling fertility. Then, unless programs for the effective provision of other means of family planning are at least 40 times costlier than programs for equalizing the availability of legal abortions at the same average incidence, a program to increase the selection differential for measured intelligence would do better to provide other means of fertility control.

The conclusions reached necessarily apply only to the situations from which the data came. Apparent selection for measured in-

telligence iterated over generations would probably not increase genotypic intelligence indefinitely because heritability, methods of measurement, and other boundary conditions would change. Conclusions about the relative consequences of alternate programs which affect measured intelligence must change as patterns of fertility change over generations.

The calculations and inferences offered here illustrate how the present and imminent genetic consequences of certain social practices can be estimated and demonstrate the need for current and detailed data on these practices if confidence limits are to be assigned to the inferences.

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