

HISTORICAL TRENDS IN THE SEX RATIO AT BIRTH

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ABSTRACT

This study of historical trends in the sex ratio at birth is based on national vital registration data for eight large populations (Sweden, France, England and Wales, U.S. whites, U.S. blacks, Japan, Taiwan and Australia). Trends in the sex ratio at birth are examined in the light of the changing quality of the birth registration data in each country. For four of these populations (Sweden, England and Wales, Japan, Taiwan), secular upward trends in the sex ratio at birth are detected. For two other populations (France, American blacks), some evidence of trends exists. These trends cannot be explained by deficiencies in the registration of births. Their causes must then be related to secular variation in factors found to determine the sex ratio at birth, such as the decline in prenatal mortality and the changing composition of births by birth order and parental age.

INTRODUCTION

The sex ratio of live births in human populations usually varies between 104 and 107 boys per 100 girls. The disparity between the number of male births and the number of female births was observed for the first time in 1662 by John Graunt, and has been the object of scientific curiosity ever since. A number of demographic studies of the sex ratio at birth (SRB) are available. They have revealed that the apparent homogeneity across populations and over time has to be qualified in at least two instances.

First, while the usual SRB for white populations is estimated to be about 106 males per 100 females, the SRB for black populations is significantly lower and ranges from 102 to 104 (see, for example, Visaria, 1967). The second case of departure from the usual levels is the rise in the SRB of belligerent countries during and after wars. Marked increases (of 1 to 2 percent) were observed in France and England and Wales at the time of World War I and World War II (see, for example, Houdaille, 1973; James, 1987a; Aubenque, 1989).

A third pattern of variation in the SRB will be the focus of this paper. The pattern consists of secular increases, of up to 2 percent, in the SRB. Such trends have been previously reported in a few studies. Lampe (1954, 1955) finds an increase in consecutive five year values of the SRB in the Netherlands between 1900 and 1949. Imaizumi and Murata (1981) describe a significant linear increase in the yearly values of the SRB of Japan between 1901 and 1977. Schtickzelle (1981a) examined the yearly values of the SRB since the beginning of the century in five countries. He concludes that statistically significant upward linear trends exist in the SRB of Belgium, Sweden, and England and Wales, but finds no trend in the SRB of Australia and the US. Ulizzi (1983) and De Bartolo (1985) find an increase in the Italian SRB since the 1930s. Lastly, Aubenque (1989) describes the declining secular trend in France between the beginning of the 19th century and the middle of the 20th century and finds that fluctuations in the SRB are more closely associated with variations in the male birth rate than in the female birth rate.

In this paper, historical data on the number of live births by sex are described and compared for eight populations. In all cases, national vital registration data are used and annual values are calculated. The series extend back to the earliest periods for which births were recorded by sex. In addition to providing a unique opportunity to compare a variety of large populations, this paper focuses on some aspects of the study of historical variation in the SRB which have not been developed previously. First, this paper discusses some typical problems in the recording of births by sex and the estimation of the SRB. Such problems may lead to systematic patterns of distortion and therefore must be examined (Part 1). Second, the variation over time in the SRB of each of the eight populations is examined in the light of the changing quality of the birth registration data (Part 2). Lastly, the contributions to the secular increase of the main factors usually believed to determine the SRB are discussed (Part 3).

1. SOURCES OF DATA AND ESTIMATION OF THE SEX RATIO AT BIRTH

This study is based on national vital registration data. The registration of vital events by each country is indeed the major source of data for estimating the SRB. Vital registration is also the most reliable source, even though the quality of such registration varies from country to country. In the case of unsatisfactory registration, the distortions can be expected to follow certain patterns which will be briefly reviewed. Most patterns of distortion are linked to the prevailing preference for a particular sex or sequence of sexes.^{1 2}

¹See Freedman and Coombs (1974) for a discussion of parental preferences about the sex of children in several developed and developing countries.

²In addition to the registration of vital events, surveys constitute a primary source of data for the estimation of the SRB. Surveys are subject to the same types of error and distortions as are vital statistics. In the case of retrospective surveys, such errors and distortions may be relatively larger for more remote periods. Moreover, in surveys, independently of the accuracy of the overall sex ratio, the sex ratios of children of the various birth orders may be distorted. For example, a tendency, in some societies, to report the first son

Differential reporting of live births by sex is one common cause of distortions of the SRB. Female births are more likely to be underreported than male births. Such underreporting would tend to raise the observed SRB. Another source of distortion lies in the underreporting of a live birth rapidly followed by the death of the child. Since neonatal mortality rates are higher for boys than for girls, it is often believed that such underreporting could lead to relatively higher underreporting of male live births, which would lower the observed SRB, although the effect would be small (Visaria, 1967; Becker and Chowdhury, 1981; Rehan, 1982). However, in some societies, it is likely that the underreporting of female babies who die soon after birth is higher than that of male babies who die soon after birth. Such differential omissions would tend to increase the observed SRB. Sex selective infanticide is more likely to affect girls than boys and hence to increase the observed SRB through the omission of the corresponding births.

Misclassification of births as either live births or stillbirths may also be a source of error in the SRB. Because the sex ratio of stillbirths is higher than that of live births, the registration of stillbirths as live births would raise the SRB. By contrast, the registration of live births as stillbirths is likely to lower the SRB, since such misclassified live births would most probably include a relatively high number of boys (who have a higher probability of dying in the first days of life than girls). Such distortions should however remain small in view of the small proportion of stillbirths.

Lastly, subtle speculations are offered by Goodman (1961), Stern (1973), Keyfitz (1977), and Toro (1981) about the effect of family planning on the SRB when a particular sex is preferred. If the likelihood

as older than the first daughter has been observed (Pakrasi and Halder, 1971; Kang et al., 1981). It should also be noted that hospital data are subject to distortions in countries where only a fraction of the births occur in hospitals. Indeed, such births are likely to include a relatively high number of difficult births, which generally involve high proportions of boys. Hence the sex ratio of hospital births is likely to be higher than the overall SRB of the population (James, 1975; Toivanen and Hirvonen, 1970).

of a male birth is the same for all couples, parents cannot influence the proportion of boys in the population by a stopping rule. If the couples were heterogeneous in their probability of male births, then the SRB in the population could be altered, a preference for boys leading to a lower SRB.

Given the multiplicity of the possible biases in the data on live births by sex, it is clear that only in a few countries is the registration of vital events of a sufficient quality to permit the study of the SRB. An additional difficulty in the estimation of the SRB is the size of the random error. Visaria showed that "one needs a surprisingly large number of births to obtain an observation of a sex ratio within a narrow confidence range" (1967, p.133). For example, Table 1 shows the 95 percent confidence limits for a SRB of 106, according to sample size. As a consequence of the variation, only national level statistics can be considered in this study of trends in the SRB.

TABLE 1: NINETY-FIVE PERCENT CONFIDENCE LIMITS
FOR A SEX RATIO AT BIRTH OF 106

Number of observed births	Lower limit	Upper limit
100	71.4	158.1
1,000	93.6	120.0
10,000	101.9	110.2
100,000	104.7	107.3
1,000,000	105.5	106.4

Source: Visaria, 1967, p. 133.

Figures 1 to 8 illustrate the evolution since 1900 of the SRB in eight populations or countries: Sweden, France, England and Wales, Australia, US (whites), US (blacks), Japan, and Taiwan. These countries have had high quality vital statistics for most of the period considered.

Figures 1 to 8 present the observed annual values of the SRB. Note that the scales are identical and that Figures 1 to 8 are thus directly comparable. The magnitude of the annual fluctuations in the SRB is due, in part, to the random factor. Data for the three European countries are also available for earlier periods and are presented in Figure 9. Ten-year averages (Sweden, 1750 - 1900; England and Wales, 1841 - 1900) or five-year averages are used in Figure 9.³

2. SECULAR TRENDS IN THE SEX RATIO AT BIRTH

Figures 1 - 9 reveal several instances of secular trends in the SRB. For each country or population, the quality of the data has to be assessed in order to distinguish any real trends in the SRB from patterns of distortion due to the long-term variation in the quality of the vital registration statistics.

In Sweden, the registration of births was regulated by law in 1686. Regular and systematic population statistics have been kept since 1749 (Larsson, 1965; Sweden. Statistiska Centralbyran, 1969). The Swedish data are of a very high quality, and it is likely that the upward trend observed between 1750 and the beginning of the 20th century is real and not an artifact of the data collection. No trend is detected in the 20th century.

In France, the tradition of birth registration was already established when the Napoleonic administration organized the official registration of vital events (van de Walle, 1969, 1974). The annual values of the SRB in France are available since 1820 and are presented in Figure 10. The long decline throughout the 19th century is remarkable. Evidence gathered by van de Walle (1974) seems to indicate that misreporting or underregistration of infants deaths, stillbirths, and female births are likely to explain the downward trend. In fact, a

³All data are given in Appendix.

specific problem characterizes the birth registration data in France. It lies in the fact that an unknown, variable proportion of the children born alive but deceased before the registration of their birth were recorded as stillbirths, in conformity with the Napoleonic Code's provisions in matters of inheritance (van de Walle, 1974, p. 48). van de Walle estimates the resulting underestimation of the number of live births to be of the order of only 1 percent. The expected effect of a misclassification of live births as stillbirths is an underestimation of the SRB, because of the boys' higher probability of dying in the first days of life. However, in the case of France, such misclassification may have been systematically linked to sex and birth order, with unpredictable effects on the SRB. It is likely that such potentially distorting effects have diminished over time, and become negligible since the end of World War II. Although no trend is evident in the SRB of France in the 20th century, it appears that the average level after World War II is higher than that before World War II. The high level of the SRB after World War II may or may not be explained by the improvement in the registration of live births. The rise in the SRB during and after World War I and World War II appears clearly.

In England and Wales, birth registration was established in 1836. Registration was deficient, but decreasingly so, until the decade from 1871 to 1880, when it is estimated to have been essentially complete (Teitelbaum, 1974). It has probably remained complete since then. The marked decline observed in the SRB prior to 1870 may be related, at least in part, to the increasing completeness of birth registration (as is the case for France). There is a notable increase in the SRB of England and Wales between the two world wars. This increase does not seem to be due to any known deficiencies of the birth registration. As in France, the SRB increased markedly during and after the two world wars. Since the early 1970s, the SRB seems to have declined slightly.

In the US, the completeness of the birth registration varies by race. For American whites, birth registration was estimated to be 95 percent complete by 1942 (US Department of Health and Human Services, 1984, Vol. 1, p. 45). No marked trend appears in the SRB of American

whites between 1915 and 1979, except for a slight decrease during the years of the baby boom. It is unlikely that such a decline could be due to changes in the quality of the birth registration (essentially complete during that period). A slight decline is also observed since the mid-1970s.

The quality of the birth registration for American blacks is questionable for the earlier years since it was only in 1947 that the estimated completeness reached 90 percent and in 1953 that it reached 95 percent (US Department of Health and Human Services, 1984, Vol. 1, p. 45). In the US, births that occur in hospitals are almost completely registered, while home deliveries are much less fully recorded. The increase, for the black population, in the proportion of hospital births may have contributed to the decline observed in the SRB between the early 1920s and the early 1950s. Hence, as is the case for France and England and Wales, this decline could be related to the increasing completeness of birth registration and may not indicate a real trend in the SRB. Since the early 1960s, the SRB of American blacks appears to have been increasing, but no systematic variation in the registration of births was noted for the same period.

In Japan, the family registration system was established in 1872. Major improvements were made in the 1920s and birth registration has been virtually complete since the late 1940s (International Institute for Vital Registration and Statistics, 1979).⁴ The systematic short-term

⁴ The Japanese birth registration data present a remarkable peculiarity. According to traditional belief in Japan, the year of birth influences the future character and life of the child. Such influences may differ by sex. The Japanese calendar consists of series of five cycles of twelve years each. Each year corresponds to one of twelve symbolic animals which are repeated in the same sequence. Hence the superstitions associated with the date of birth may be expected to reappear every twelve years, or every sixty years. The Japanese sex ratio at birth reveals two striking patterns of distortion. First, particularly high peaks preceded and followed by low points are observed in 1906 and 1966. These two years correspond to the symbolic Fire Horse. A strong traditional belief in Japan, is that girls born in the year of the Fire Horse tend to kill their husbands and become widows. This belief apparently motivated many parents of girls born in 1906 and 1966 to misreport the date of birth and to attribute

distortions that are due to the influence of certain traditional beliefs do not mask a marked increase in the SRB between the 1920s and the end of the 1960s. The exceptionally high values observed in the years 1968 to 1970 may have been brought about by coding errors due to the introduction of computerized data analysis in 1968 (Imaizumi and Murata, 1981, p. 78). However, a decline seems to have occurred between the mid-1970s and the late 1980s.

In Taiwan, reliable birth registration data are available between 1910 and 1940, and since 1949. The high values observed in the SRB before 1910 and between 1940 and 1943 are due to the lower quality of the birth registration for those periods. The distortions can most probably be attributed to the relatively higher underreporting of girls, in this country where a preference for boys prevails. A marked increase in the SRB is observed since the early 1950s. No systematic distortion in the birth registration data over the same period seems to explain this trend in Taiwan.

In Australia, a tradition of registration of vital events initiated in the 19th century (Australia. Bureau of Statistics, 1977) contributed to the high quality of birth registration data. No marked secular trend is observed in the 20th century SRB.

To sum up, secular upward trends, which cannot be explained by deficiencies in the data, seem to exist in the SRB of four out of eight populations (Sweden, England and Wales, Japan, Taiwan). In Sweden the

it either to the preceding or to the following year. It should be added that the demographic consequences of the belief associated with the Fire Horse include significant drops in fertility and significant increases in the number of abortions during those years (Japan. Ministry of Health and Welfare, 1982, Vol. 1, p. 45). The other pattern of distortion is also linked to a negative superstition. According to traditional belief, girls born in the year of the Tiger tend to be to aggressive. Although this superstition is weaker than that associated with the Fire Horse, it has also brought about high values in the SRB of the Tiger years (1914, 1926, 1938, 1950, 1962, 1974 and 1986). The magnitude of these peaks decreases with time, probably as the strength of the superstition fades.

upward trend in the SRB was most marked in the 19th century. In England and Wales, it was particularly marked between the two world wars. In Japan, the upward trend started in the 1920s, and lasted until the late 1960s. In Taiwan, the same trend has been observed since World War II. Some evidence of similar trends appears in two other populations. In France, the average levels of the SRB are higher after than before World War II. The SRB of American blacks appears to have been increasing since the 1960s. No particular trend appears in the evolution of the SRB of Australians. Downward trends are observed in 19th-century France and England and Wales, as well as in the black population of the US between 1920 and 1950. These downward trends correspond to periods of incomplete but improving birth registration and are unlikely to reflect actual changes in the SRB. A relatively short and unexplained downward trend is observed for the American white population during the years of the baby boom. Since the early 1970s, three instances of declines are observed (England and Wales, US whites and Japan).

3. POSSIBLE CAUSES OF SECULAR INCREASES IN THE SEX RATIO AT BIRTH

The determinants of the SRB have been studied extensively since the first observation of a disparity between the number of male and female births. Physiological characteristics of the reproductive tract seem to influence the SRB through their effects on the sex ratio at conception, and may explain the racial variation. A behavioral factor, coital frequency, is also thought to determine the SRB, through the relationship between the timing of intercourse during the menstrual cycle and the probability of a male conception. In addition, research has revealed that some individual characteristics such as age of parents and parity may also affect the probability of a male birth. Finally, socioeconomic conditions have been thought to affect the SRB through their influence on prenatal mortality.

The causes of the secular trends detected in the SRB of several populations must be related, at least in part, to some of the determinants that have been identified to date. Have some of these factors undergone

secular changes parallel to those observed in the SRB, which could explain the trends? A rapid examination of the changes over time in the presumed determinants of the SRB reveals that no definite answer can be given to this question, in part due to the lack of documentation, but that some interesting insights may be gained.

Studies of the physiology of the sperm and research on the chemical balance of the female genital tract have produced some evidence that these factors could influence the probability of a male conception. In fact, differences in the levels of maternal gonadotrophin have been thought to explain the racial differentials in the SRB, lower levels implying a higher SRB (James, 1984a, 1984b). The likelihood of secular changes in some populations' physiological characteristics is difficult to assess. The populations under study here being fairly homogeneous with respect to their racial composition and having remained so over the period of interest, racial composition can safely be ruled out as a possible cause of the secular trends. It seems possible, however, that the physiological factors likely to affect the SRB could be related to other individual characteristics such as parental age or parity. Long-term changes in the age or parity composition of the reproductive population could then produce long-term changes in the SRB.

High coital frequency has been invoked to explain the rising SRB during and after wars. James (1983, 1987b) suggests that the chance of a male conception is higher early and late in the menstrual cycle because of rapid variation in maternal hormone levels. Women exposed to high coital rates conceive, on the average, earlier in their menstrual cycle than other women, and thus have a higher chance of having boys, according to James. The likelihood of secular increases in coital frequency in the populations for which secular increases in the SRB are observed is unknown. Since coital frequency may be related to individual characteristics such as age, for example, it could be argued that a secular variation in the age composition of the parents' population could produce a secular variation in the SRB of the children. It should be noted, however, that changes in the composition of births by parental age

and parity fail to explain fully the rise observed in the SRB of belligerent countries during war time (MacMahon and Pugh, 1953, 1954).⁵

Parental age and parity have often been thought to affect the SRB, even though the causal mechanisms (such as, possibly, hormonal or behavioral changes) of such effects have rarely been discussed. A large number of statistical studies of the relationships between parental age and parity, on the one hand, and the SRB, on the other, are available. Such studies are generally based on samples of millions of births taken from the national vital statistics of countries with high quality registration. A review of their findings reveals that parity and paternal age appear to be negatively correlated with the SRB. Births to younger fathers and births of lower orders seem to have a higher chance of being male. These effects seem difficult to quantify, but appear to remain very small (Chahnazarian, 1988). The fertility transition of western countries has been characterized by changes in the average age at childbearing as well as by changes in the distribution of families by size. The female mean age at childbearing varies from country to country but a general and significant decline has been observed since the beginning of the fertility transition. The proportions of large families have decreased significantly over the same period (see, for example, Festy, 1984). With the presumed increase in the proportion of births to younger fathers, and the increase in the proportion of children of lower birth orders, the expected effect on the long-term trend in the SRB of western countries would indeed be an increase. The question of whether the changes in the age and parity composition of the population of parents could be sufficient to explain the observed increases in the SRB of some countries remains open. As an illustration of the magnitude of some of those compositional changes, Figures 11 and 12 present the annual values of the SRB and the annual proportion of first births in the U.S (whites) and Japan, respectively. The proportion of first births varies from levels close to 25 percent of all births (around 1920 and 1960 in the U.S. and around 1950 in Japan) to

⁵ See Chahnazarian (1988) for a discussion of various hypotheses regarding the rise in the SRB during and after wars.

over 40 percent (since the mid-1970s in the U.S. and since the mid-1960s in Japan). The expected relationship between the proportion of first births and the SRB is positive. While there are some indications of concomitance in the trends of the two variables, it is clear from these figures that multivariate modelling is needed to explain the levels observed in the SRB.

Because of the higher male mortality during most of the gestation period, factors affecting prenatal mortality rates and patterns can be expected to affect the sex ratio of surviving fetuses eventually to be born alive. Since better socioeconomic conditions and medical care have been associated with lower rates of prenatal mortality, it is easy to speculate that improving socioeconomic conditions and medical care could have produced a secular increase in the sex ratio at birth. The decline in the stillbirth rates of western countries has been considerable. For example, the ratio of stillbirths to live births dropped from the estimated levels of 30 to 40 per thousand in the second half of the 19th century in Sweden and Belgium to values closer to 10 per thousand in the 1970s (Schtickzelle, 1981b). Simultaneously, the sex ratio of stillbirths has been decreasing, dropping from values as high as 130 in Sweden and Belgium at the beginning of the century to levels closer to 110 in the 1970s (Teitelbaum, 1971; Schtickzelle, 1981b, Ulizzi, 1983). The effect, on the SRB, of changes in the stillbirth rate and in the proportion male among stillbirths was examined for various countries by Schtickzelle (1981b), Imaizumi and Murata (1981), and Chahnazarian (1986), using different methods. All results indicate that the change in the rate and sex ratio of stillbirths has contributed to the secular increase in the sex ratio of live births, but fails to fully explain the trends. Because of the scarcity of data, the impact on the SRB of the variation over time in early prenatal mortality remains unknown.

SUMMARY

This study of historical trends in the SRB is based on national vital registration data for eight populations with a long tradition of high quality birth registration. For four of these populations (Sweden, England and Wales, Japan, Taiwan), secular upward trends in the SRB are detected. For two other populations (France, American blacks), some evidence of trends exist. These trends cannot be explained by deficiencies in the registration of births. Their causes must then be related to secular variation in factors found to determine the SRB.

Clearly, improvements over time in socioeconomic conditions and medical care have caused a marked decline in prenatal mortality. In turn, such a decline seems to have contributed to the long-term increase in the SRB. Another source of secular variation may lie in the characteristics of the fertility transition of western countries. Significant declines in the mean age at childbearing and in the proportion of large families were observed during the transition. Such changes could have contributed to the secular increase in the SRB. The association between changes in the composition of births by birth order and by age of the parents needs to be fully modelled. Yet, it would not be surprising to discover that a model taking full account of the two factors most strongly related to the SRB fails to explain a large part of the variation observed. Indeed, the mechanisms through which parental age and parity operate on the probability of having a boy or a girl are unknown. The relationship between parental age and parity, on the one hand, and the unknown intermediate variables, on the other, may also change over time, in ways that may or may not be related to the prevailing composition by age and parity of the population of parents. This would be particularly true if such intermediate variables were essentially behavioral, as would be the case if coital frequency was among them.

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FIGURE 1
SEX RATIO AT BIRTH SINCE 1900
SWEDEN

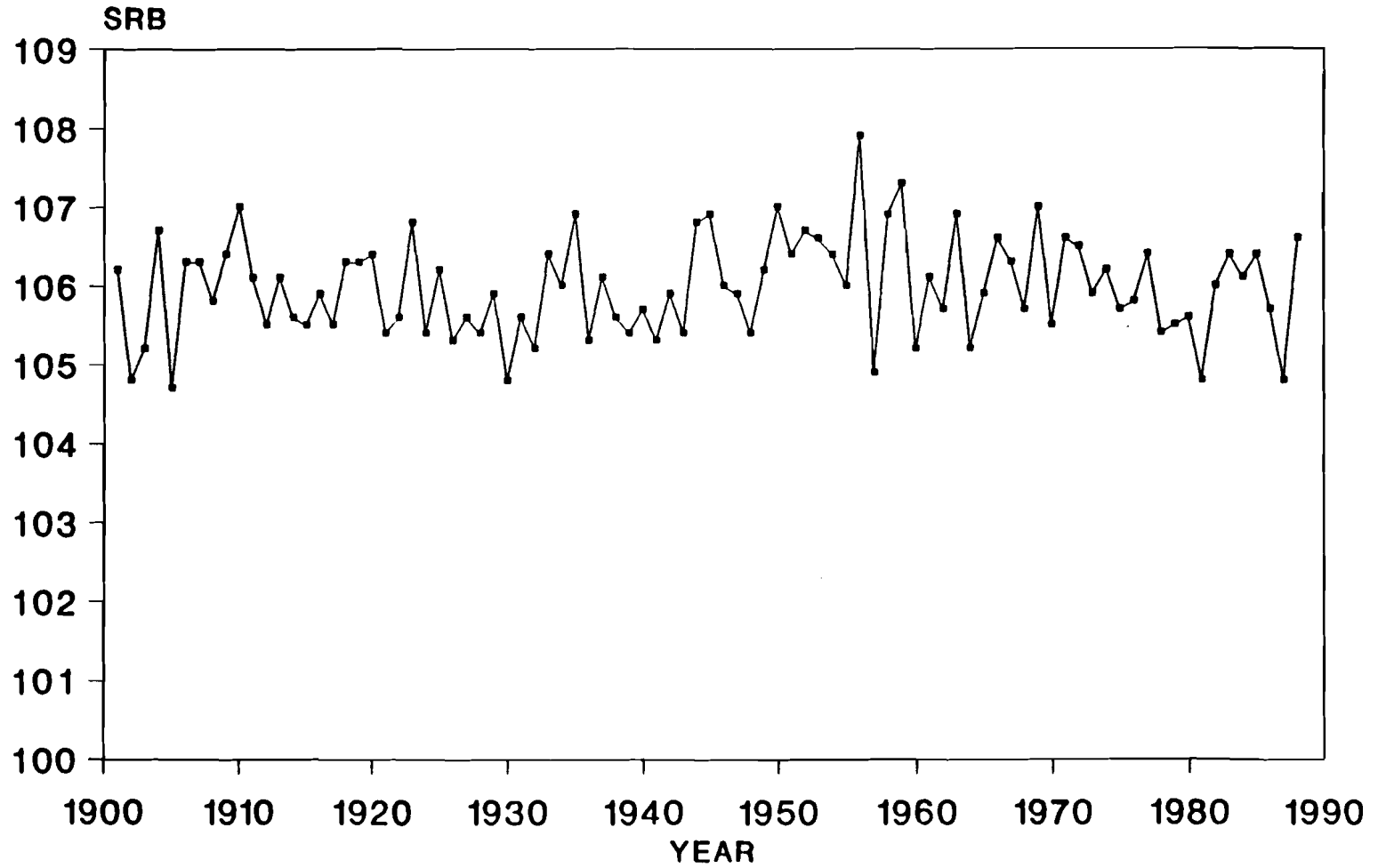


FIGURE 2
SEX RATIO AT BIRTH SINCE 1900
FRANCE

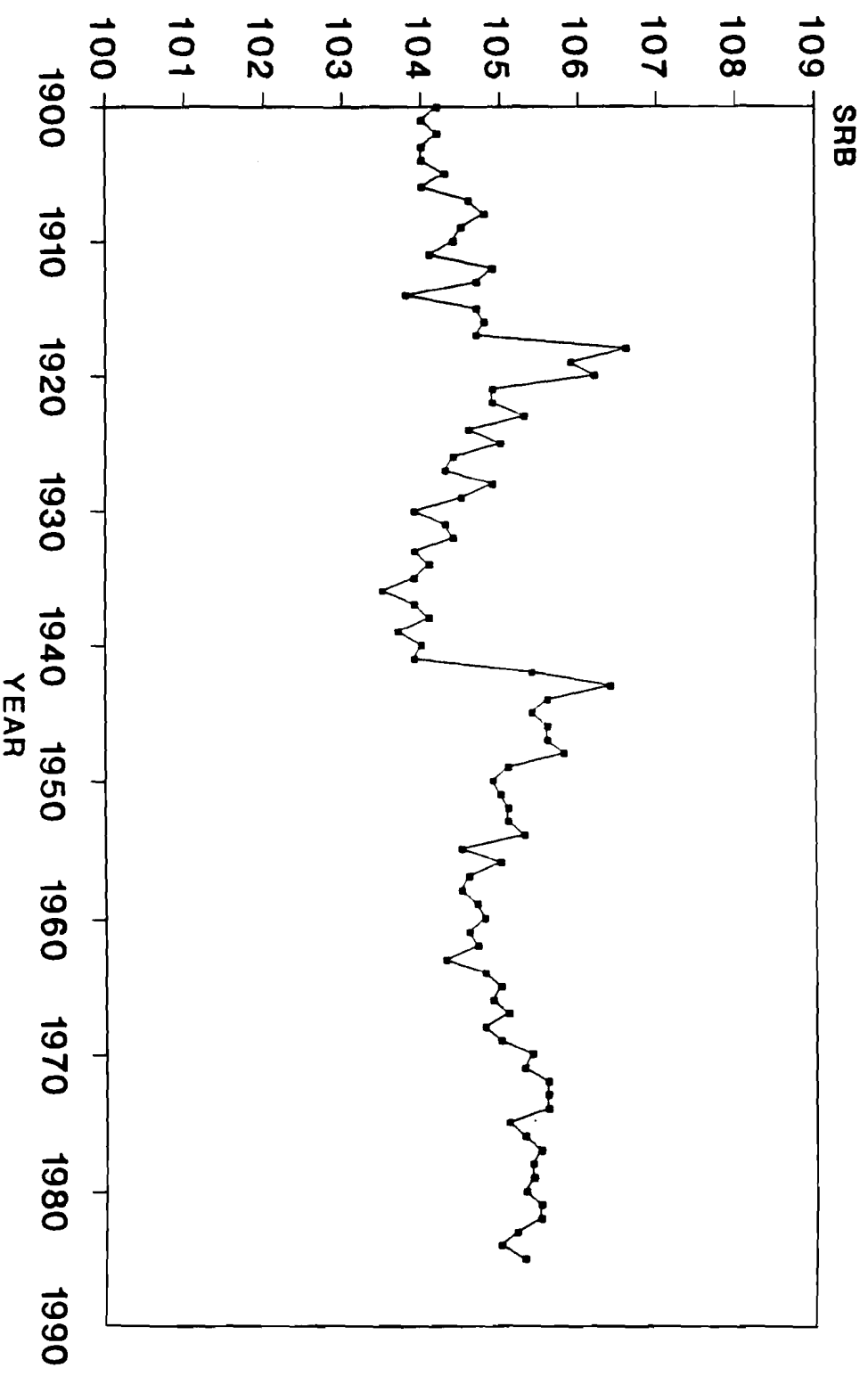


FIGURE 3
SEX RATIO AT BIRTH SINCE 1900
ENGLAND AND WALES

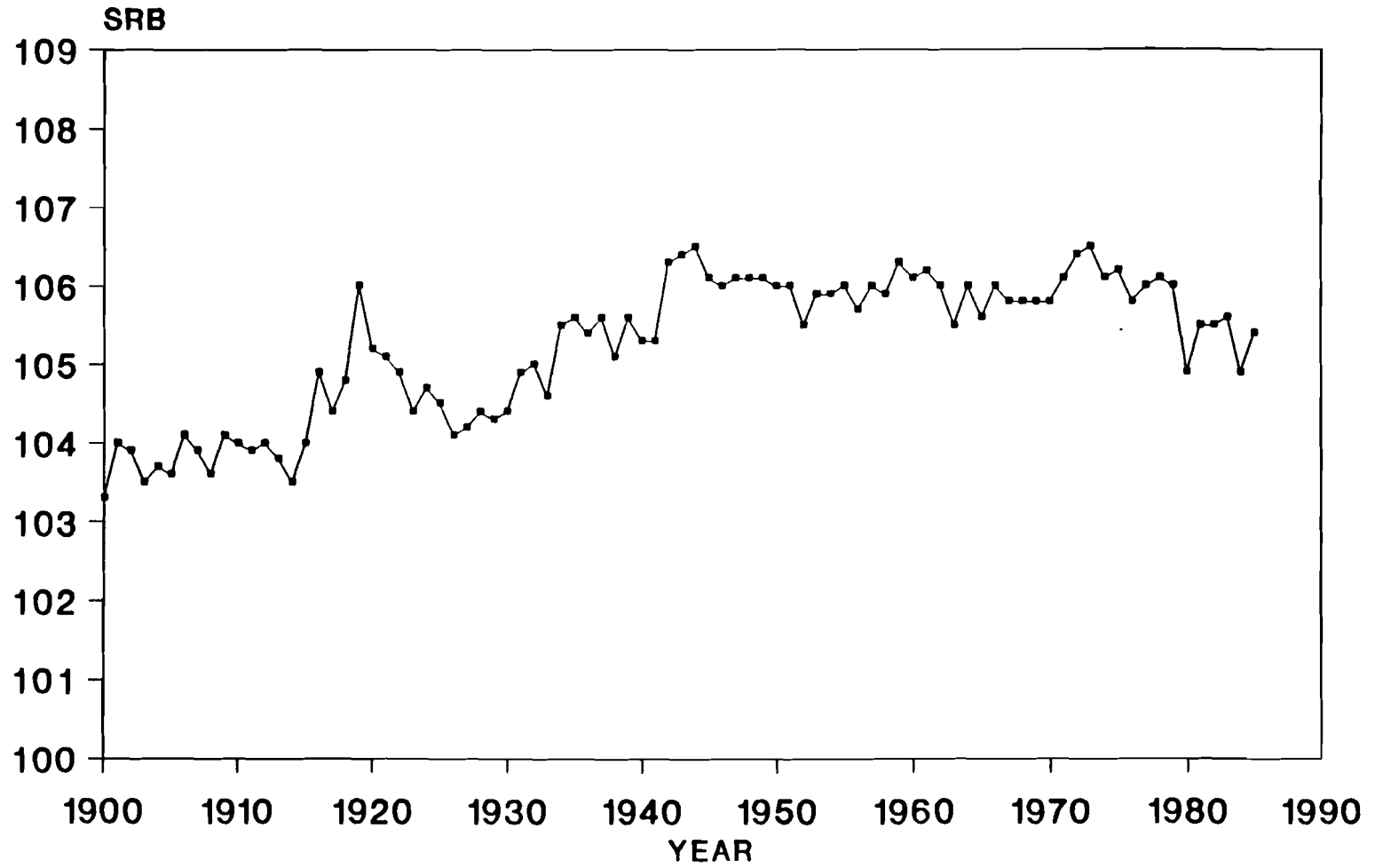


FIGURE 4
SEX RATIO AT BIRTH SINCE 1900
U.S. (WHITES)

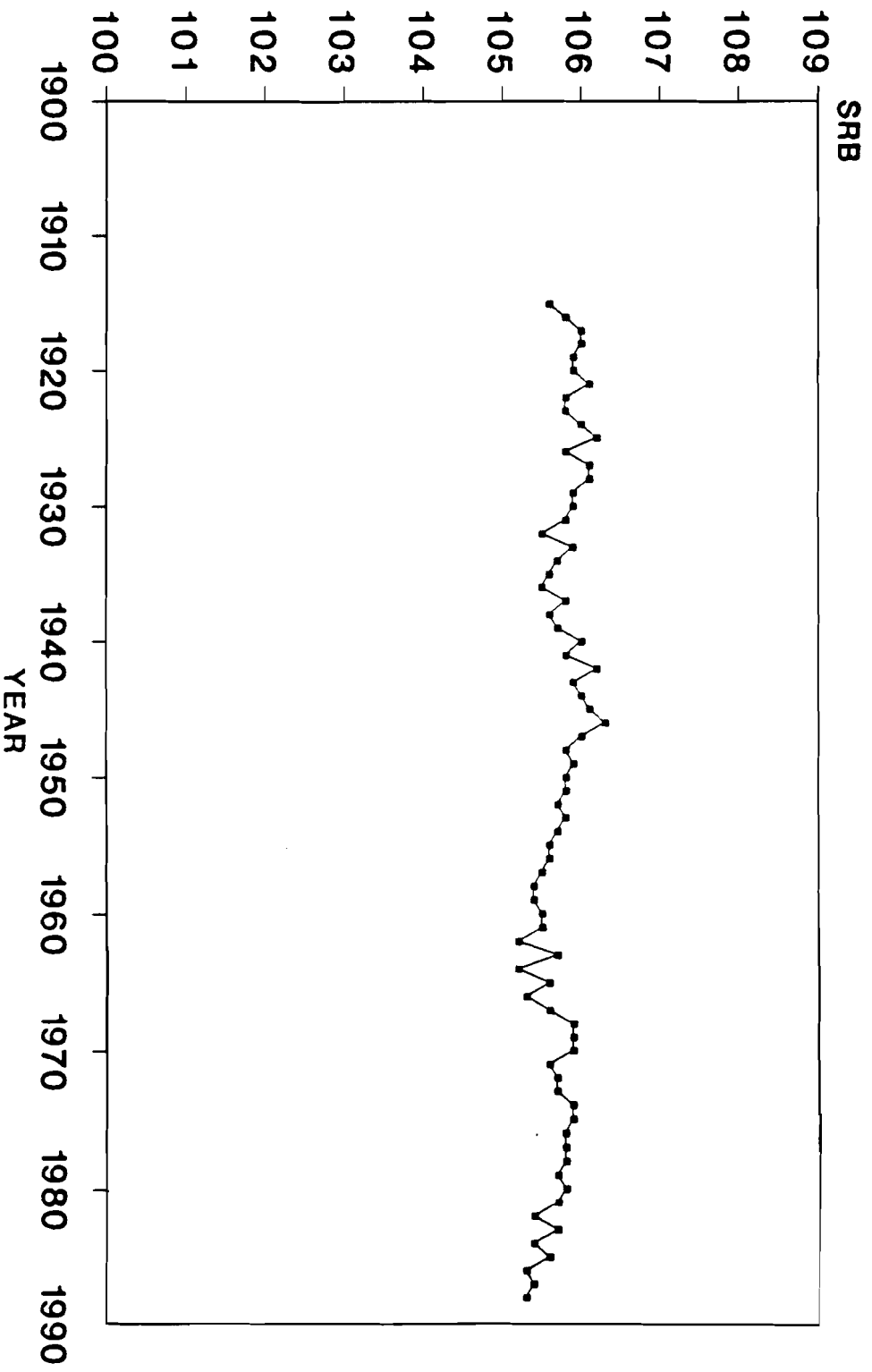


FIGURE 5
SEX RATIO AT BIRTH SINCE 1900
U.S. (BLACKS)

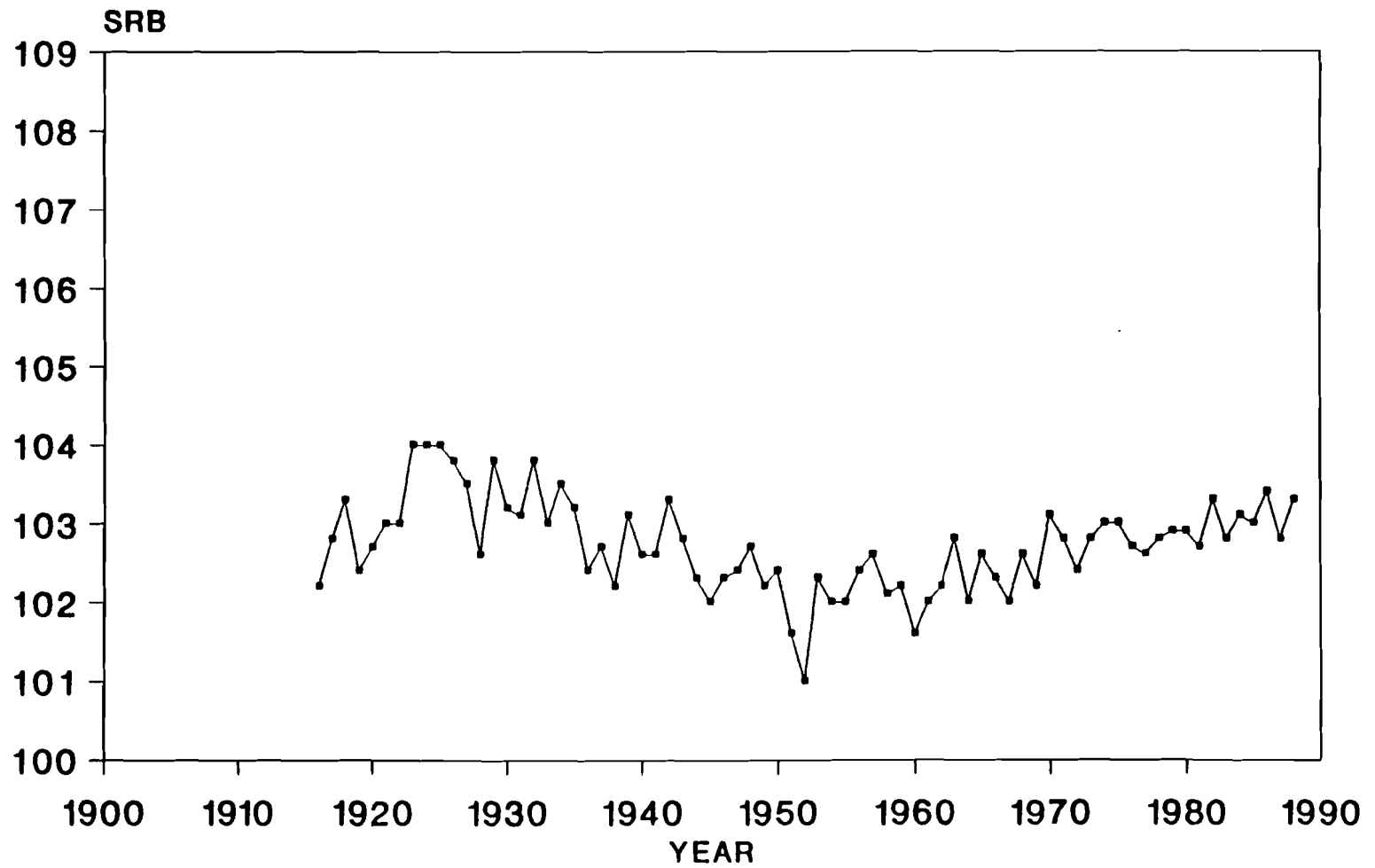


FIGURE 6
SEX RATIO AT BIRTH SINCE 1900
JAPAN

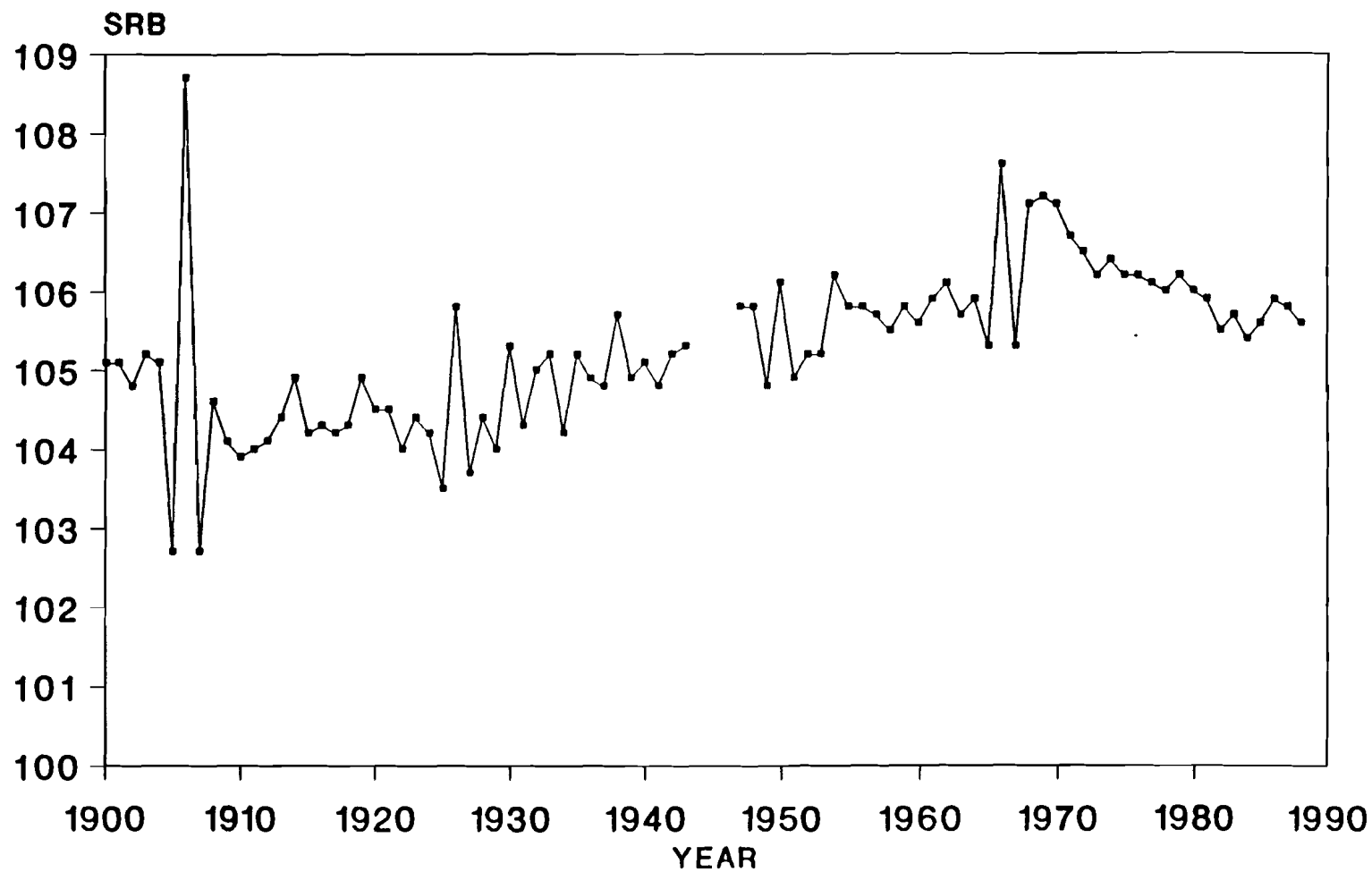


FIGURE 7
SEX RATIO AT BIRTH SINCE 1900
TAIWAN

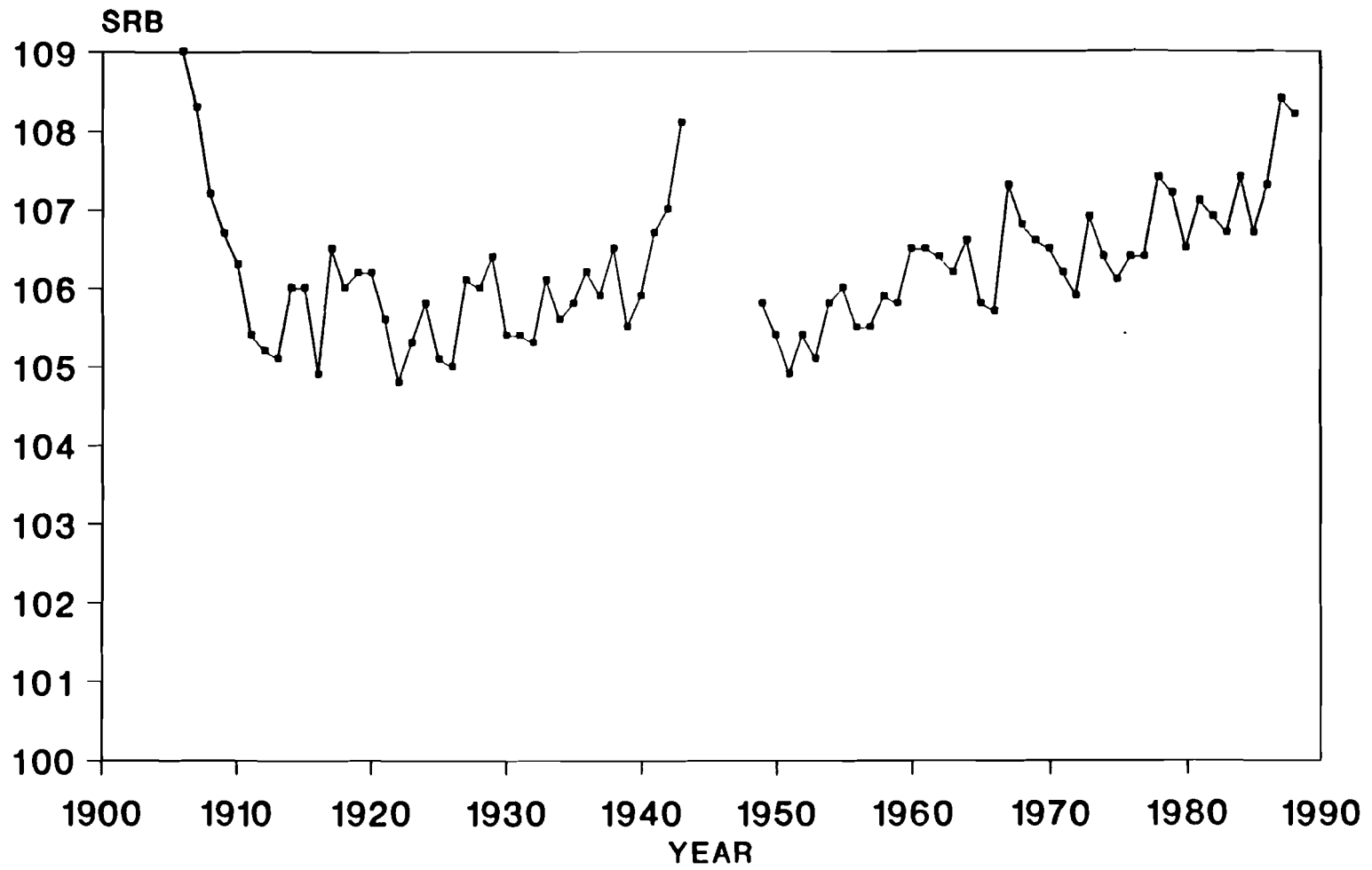


FIGURE 8
SEX RATIO AT BIRTH SINCE 1900
AUSTRALIA

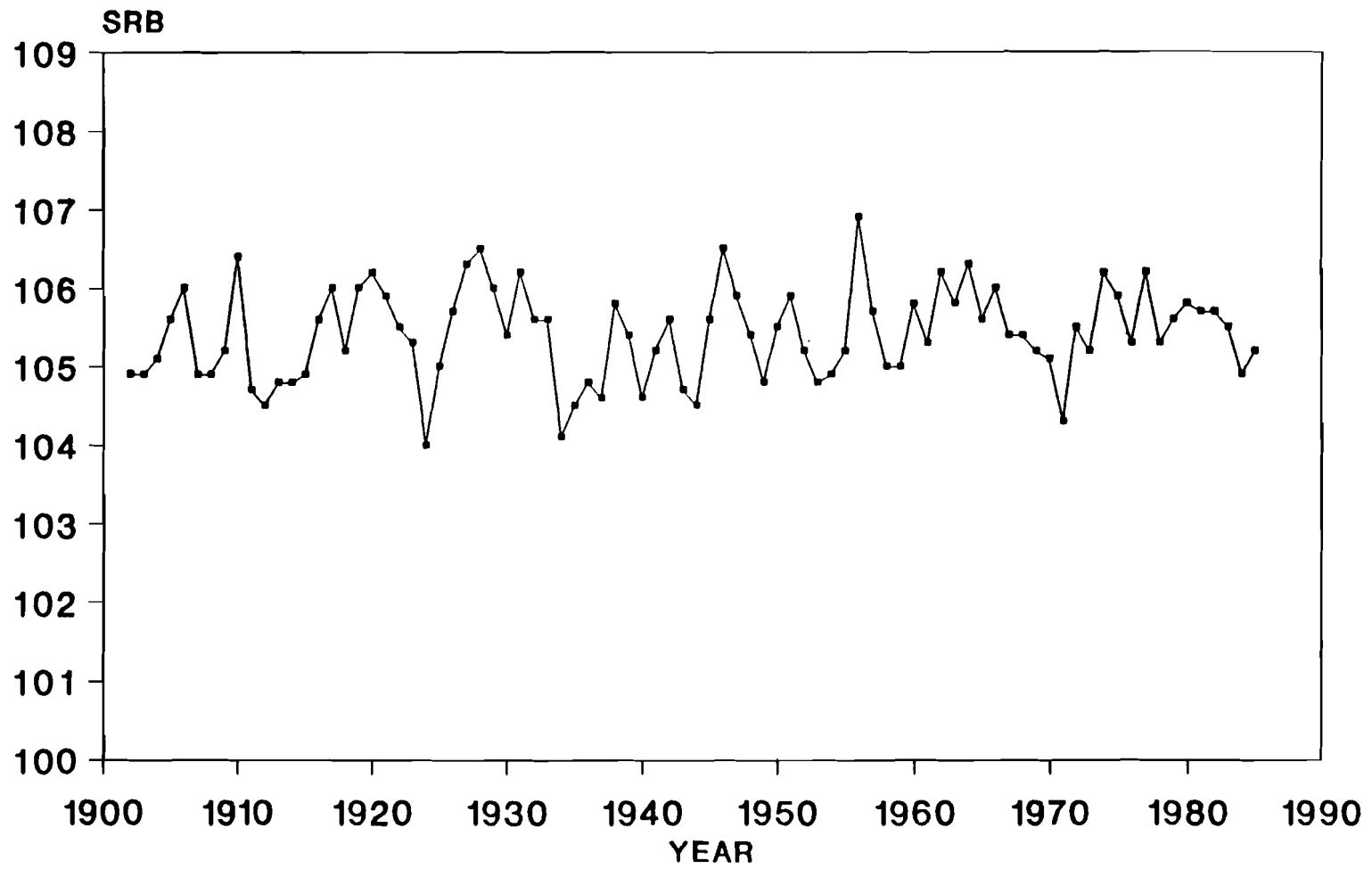


FIGURE 9
SWEDEN, FRANCE, ENGLAND AND WALES
SEX RATIO AT BIRTH SINCE 1750

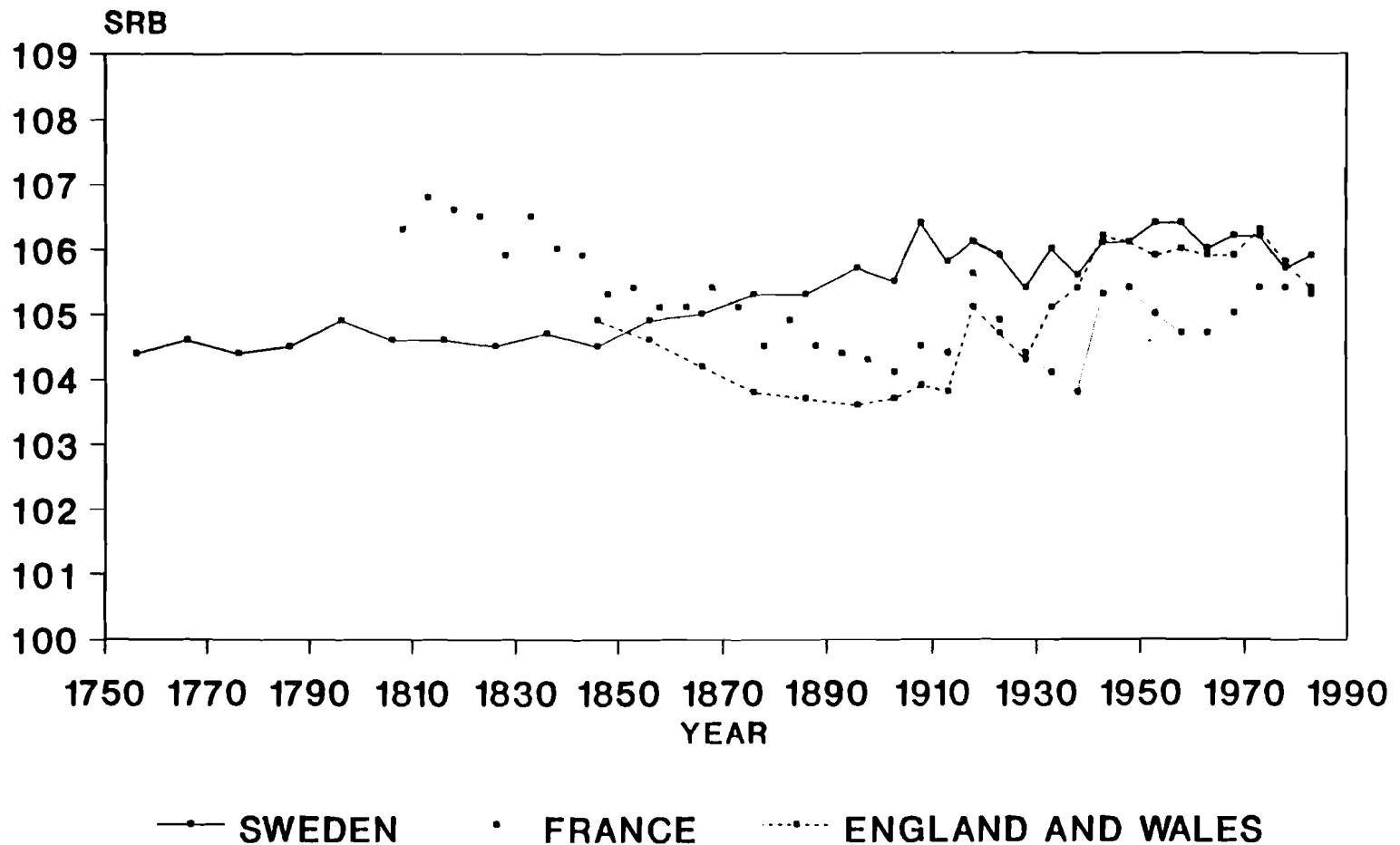


FIGURE 10
FRANCE
SEX RATIO AT BIRTH 1820-1985

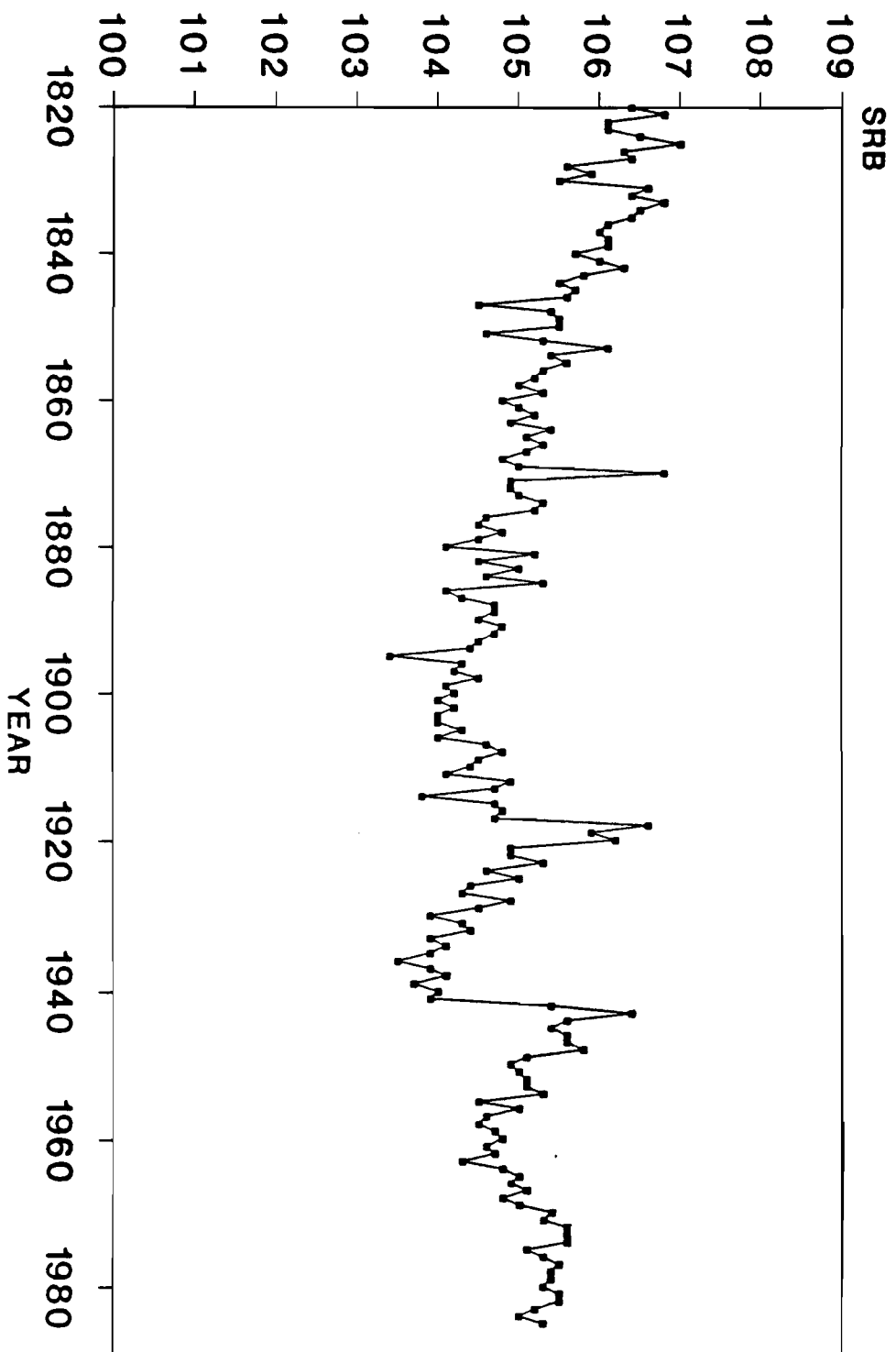


FIGURE 11
SEX RATIO AT BIRTH AND PROPORTION
OF FIRST BIRTHS - U.S. (WHITES)

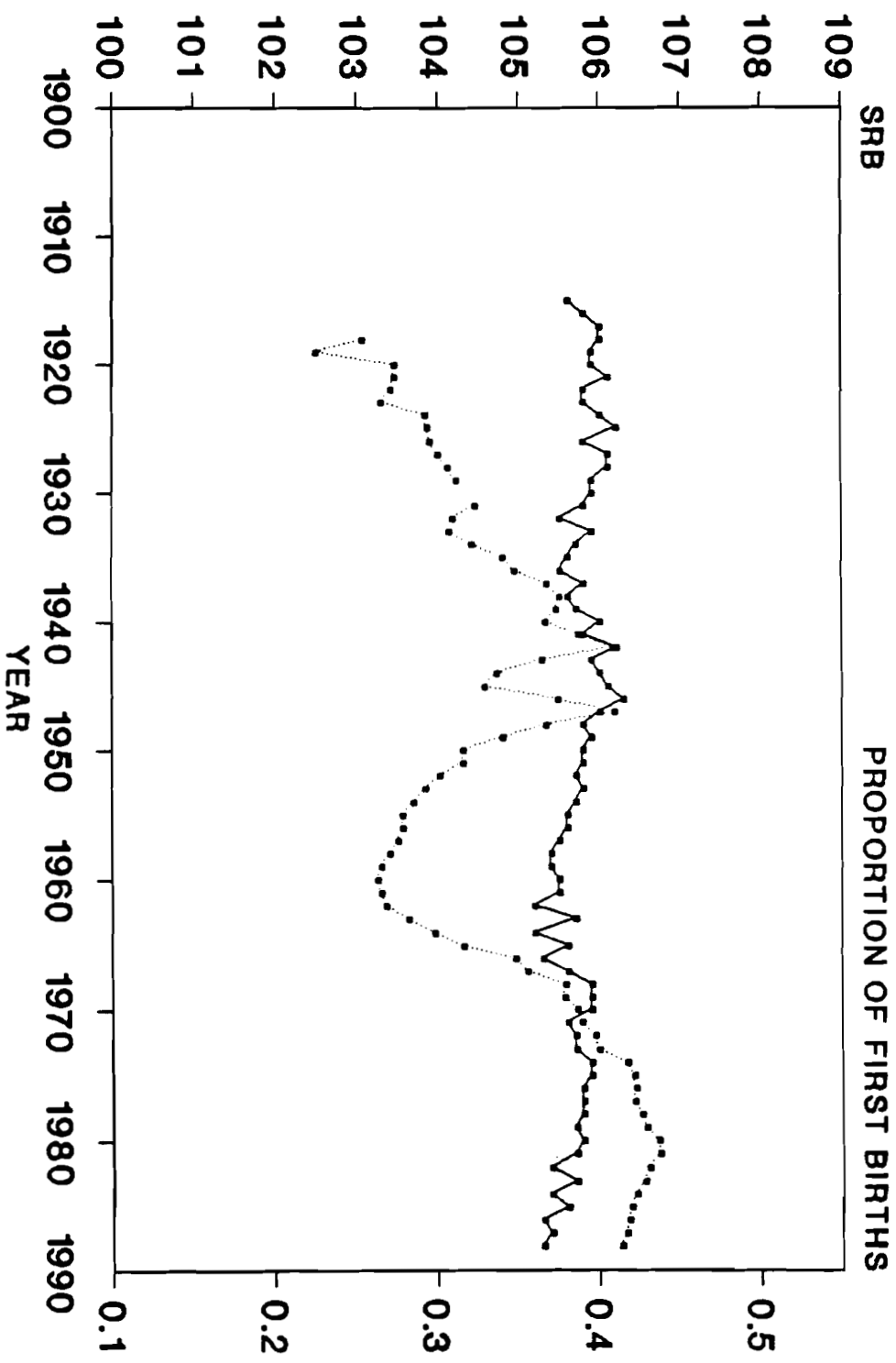
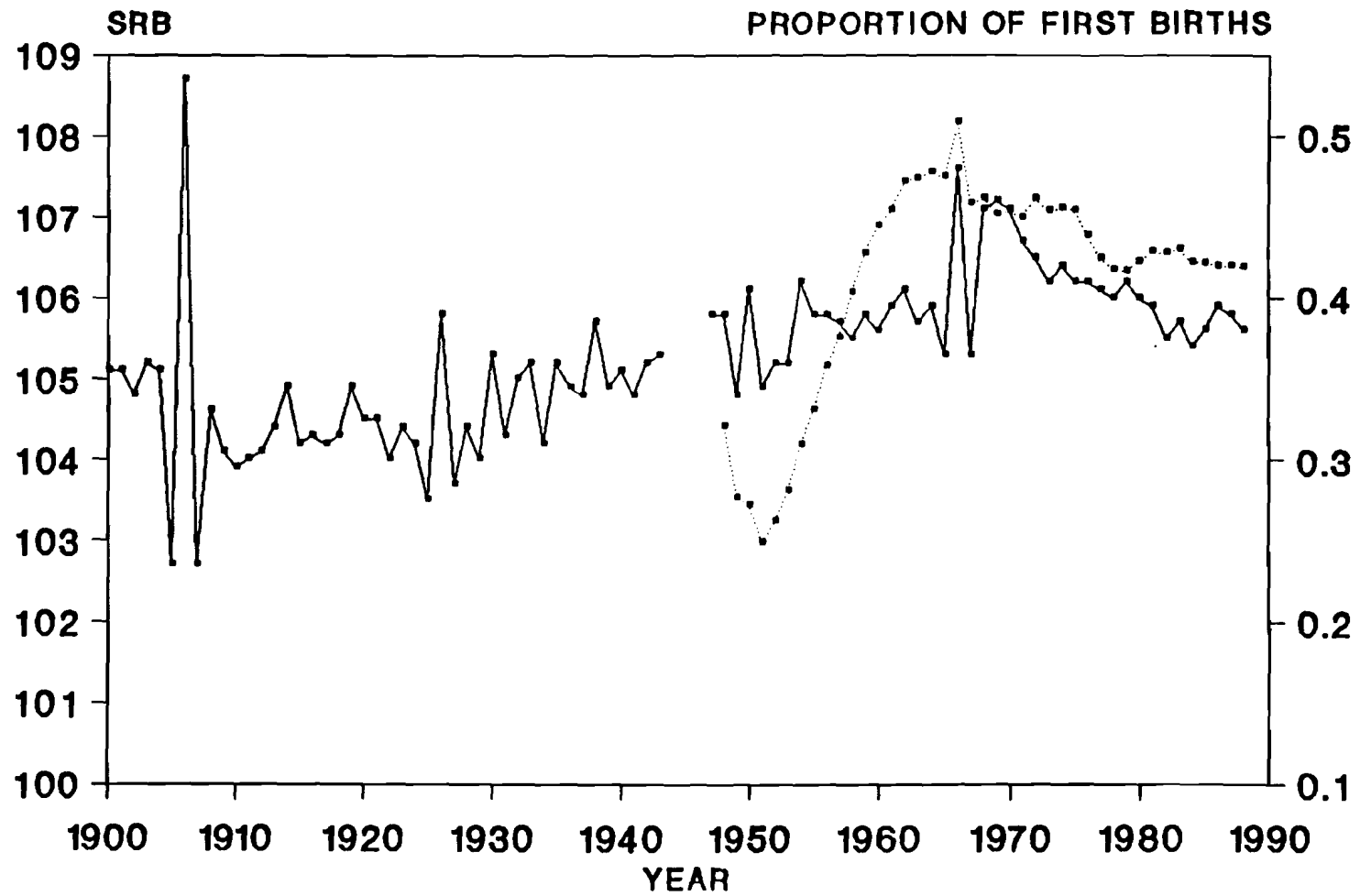


FIGURE 12
SEX RATIO AT BIRTH AND PROPORTION
OF FIRST BIRTHS - JAPAN



APPENDIX

TABLE A1: SEX RATIO OF LIVE BIRTHS IN EIGHT SELECTED POPULATIONS.
AVAILABLE DATA SINCE 1900. ANNUAL VALUES

YEAR	SWEDEN	FRANCE	ENGLAND AND WALES	U.S. (WHITES)	U.S. (BLACKS)	JAPAN	TAIWAN	AUSTRALIA
1900		104.2	103.3			105.1		
1901	106.2	104.0	104.0			105.1		
1902	104.8	104.2	103.9			104.8		104.9
1903	105.2	104.0	103.5			105.2		104.9
1904	106.7	104.0	103.7			105.1		105.1
1905	104.7	104.3	103.6			102.7		105.6
1906	106.3	104.0	104.1			108.7	109.2	106.0
1907	106.3	104.6	103.9			102.7	108.3	104.9
1908	105.8	104.8	103.6			104.6	107.2	104.9
1909	106.4	104.5	104.1			104.1	106.7	105.2
1910	107.0	104.4	104.0			103.9	106.3	106.4
1911	106.1	104.1	103.9			104.0	105.4	104.7
1912	105.5	104.9	104.0			104.1	105.2	104.5
1913	106.1	104.7	103.8			104.4	105.1	104.8
1914	105.6	103.8	103.5			104.9	106.0	104.8
1915	105.5	104.7	104.0	105.6		104.2	106.0	104.9
1916	105.9	104.8	104.9	105.8	102.2	104.3	104.9	105.6
1917	105.5	104.7	104.4	106.0	102.8	104.2	106.5	106.0
1918	106.3	106.6	104.8	106.0	103.3	104.3	106.0	105.2
1919	106.3	105.9	106.0	105.9	102.4	104.9	106.2	106.0
1920	106.4	106.2	105.2	105.9	102.7	104.5	106.2	106.2
1921	105.4	104.9	105.1	106.1	103.0	104.5	105.6	105.9
1922	105.6	104.9	104.9	105.8	103.0	104.0	104.8	105.5
1923	106.8	105.3	104.4	105.8	104.0	104.4	105.3	105.3
1924	105.4	104.6	104.7	106.0	104.0	104.2	105.8	104.0
1925	106.2	105.0	104.5	106.2	104.0	103.5	105.1	105.0
1926	105.3	104.4	104.1	105.8	103.8	105.8	105.0	105.7
1927	105.6	104.3	104.2	106.1	103.5	103.7	106.1	106.3
1928	105.4	104.9	104.4	106.1	102.6	104.4	106.0	106.5
1929	105.9	104.5	104.3	105.9	103.8	104.0	106.4	106.0
1930	104.8	103.9	104.4	105.9	103.2	105.3	105.4	105.4
1931	105.6	104.3	104.9	105.8	103.1	104.3	105.4	106.2
1932	105.2	104.4	105.0	105.5	103.8	105.0	105.3	105.6
1933	106.4	103.9	104.6	105.9	103.0	105.2	106.1	105.6
1934	106.0	104.1	105.5	105.7	103.5	104.2	105.6	104.1
1935	106.9	103.9	105.6	105.6	103.2	105.2	105.8	104.5
1936	105.3	103.5	105.4	105.5	102.4	104.9	106.2	104.8
1937	106.1	103.9	105.6	105.8	102.7	104.8	105.9	104.6
1938	105.6	104.1	105.1	105.6	102.2	105.7	106.5	105.8
1939	105.4	103.7	105.6	105.7	103.1	104.9	105.5	105.4
1940	105.7	104.0	105.3	106.0	102.6	105.1	105.9	104.6
1941	105.3	103.9	105.3	105.8	102.6	104.8	106.7	105.2
1942	105.9	105.4	106.3	106.2	103.3	105.2	107.0	105.6
1943	105.4	106.4	106.4	105.9	102.8	105.3	108.1	104.7
1944	106.8	105.6	106.5	106.0	102.3			104.5
1945	106.9	105.4	106.1	106.1	102.0			105.6
1946	106.0	105.6	106.0	106.3	102.3			106.5
1947	105.9	105.6	106.1	106.0	102.4	105.8		105.9
1948	105.4	105.8	106.1	105.8	102.7	105.8		105.4
1949	106.2	105.1	106.1	105.9	102.2	104.8	105.8	104.8
1950	107.0	104.9	106.0	105.8	102.4	106.1	105.4	105.5
1951	106.4	105.0	106.0	105.8	101.6	104.9	104.9	105.9
1952	106.7	105.1	105.5	105.7	101.0	105.2	105.4	105.2
1953	106.6	105.1	105.9	105.8	102.3	105.2	105.1	104.8
1954	106.4	105.3	105.9	105.7	102.0	106.2	105.8	104.9
1955	106.0	104.5	106.0	105.6	102.0	105.8	106.0	105.2
1956	107.9	105.0	105.7	105.6	102.4	105.8	105.5	106.9
1957	104.9	104.6	106.0	105.5	102.6	105.7	105.5	105.7
1958	106.9	104.5	105.9	105.4	102.1	105.5	105.9	105.0
1959	107.3	104.7	106.3	105.4	102.2	105.8	105.8	105.0
1960	105.2	104.8	106.1	105.5	101.6	105.6	106.5	105.8
1961	106.1	104.6	106.2	105.5	102.0	105.9	106.5	105.3
1962	105.7	104.7	106.0	105.2	102.2	106.1	106.4	106.2
1963	106.9	104.3	105.5	105.7	102.8	105.7	106.2	105.8
1964	105.2	104.8	106.0	105.2	102.0	105.9	106.6	106.3
1965	105.9	105.0	105.6	105.6	102.6	105.3	105.8	105.6
1966	106.6	104.9	106.0	105.3	102.3	107.6	105.7	106.0
1967	106.3	105.1	105.8	105.6	102.0	105.3	107.3	105.4
1968	105.7	104.8	105.8	105.9	102.6	107.1	106.8	105.4
1969	107.0	105.0	105.8	105.9	102.2	107.2	106.6	105.2

TABLE A.1, CONTINUED

YEAR	SWEDEN	FRANCE	ENGLAND AND WALES	U.S. (WHITES)	U.S. (BLACKS)	JAPAN	TAIWAN	AUSTRALIA
1970	105.5	105.4	105.8	105.9	103.1	107.1	106.5	105.1
1971	106.6	105.3	106.1	105.6	102.8	106.7	106.2	104.3
1972	106.5	105.6	106.4	105.7	102.4	106.5	106.9	105.5
1973	105.9	105.6	106.5	105.7	102.8	106.2	106.9	105.2
1974	106.2	105.6	106.1	105.9	103.0	106.4	106.4	106.2
1975	105.7	105.1	106.2	105.9	103.0	106.2	106.1	105.9
1976	105.8	105.3	105.8	105.8	102.7	106.2	106.4	105.3
1977	106.4	105.5	106.0	105.8	102.6	106.1	106.4	106.2
1978	105.4	105.4	106.1	105.8	102.8	106.0	107.4	105.3
1979	105.5	105.4	106.0	105.7	102.9	106.2	107.2	105.6
1980	105.6	105.3	104.9	105.8	102.9	106.0	106.5	105.8
1981	104.8	105.5	105.5	105.7	102.7	105.9	107.1	105.7
1982	106.0	105.5	105.5	105.4	103.3	105.5	106.9	105.7
1983	106.4	105.2	105.6	105.7	102.8	105.7	106.7	105.5
1984	106.1	105.0	104.9	105.4	103.1	105.4	107.4	104.9
1985	106.4	105.3	105.4	105.6	103.0	105.6	106.7	105.2
1986	105.7	105.7	105.4	105.3	103.4	105.9	107.3	105.2
1987	104.8	104.8	104.9	105.4	102.8	105.8	108.4	104.9
1988	106.6	105.6	105.3	105.3	103.3	105.6	108.2	105.2

Sources:

Statistiska Centralbyrån, Befolkningsförändringar. Del 3, 1968-1988; Befolkningsräkningen, 1911-1950; Historical Statistics for Sweden, Part 1: Population (1969).

INSEE, Annuaire Statistique de la France, 1966; United Nations, Demographic Yearbook, 1981, 1986.

Great Britain. Office of Population Censuses and Surveys, The Registrar General's Statistical Review of England and Wales for the Year 1926, 1973. United Nations, Demographic Yearbook, 1981, 1986.

U.S. Department of Commerce, Bureau of the Census, Birth Statistics, 1915-1921; Births, Stillbirths, and Infant Mortality Statistics, 1922-1936; Vital Statistics of the United States, Part 1, 1937-1939; U.S. Department of Health, Education and Welfare, Vital Statistics of the United States, 1970 (Vol. 1); U.S. Department of Health and Human Services, Vital Statistics of the United States, 1979 (Vol. 1), 1988 (Vol. 1).

Japan: Ministry of Health and Welfare, Vital Statistics, Vol. 1, 1982-1988.

Taiwan: Statistical Office, Statistical Abstract of Taiwan, 1894-1946; Ministry of the Interior, Taiwan Demographic Fact Book, Republic of China 1972; Taiwan-Fukien Demographic Fact Book, Republic of China 1982-1988.

Australia: Pollard (1969); United Nations, Demographic Yearbook, 1981, 1986.

TABLE A2: SEX RATIO OF LIVE BIRTHS IN SWEDEN, FRANCE AND ENGLAND AND WALES SINCE 1750. TEN-YEAR OR FIVE-YEAR AVERAGES

PERIOD	SRB	PERIOD	SRB	PERIOD	SRB
1751-1760	104.4	1806-1810	106.3	1841-1850	104.9
1761-1770	104.6	1811-1820	104.6	1851-1860	104.6
1771-1780	104.4	1821-1830	104.5	1861-1870	104.2
1781-1790	104.5	1831-1840	104.7	1871-1880	103.8
1791-1800	104.9	1841-1850	104.5	1881-1890	103.7
1801-1810	104.6	1851-1860	104.9	1891-1900	103.6
1811-1820	104.6	1861-1870	105.0		
1821-1830	104.5	1871-1880	105.3		
1831-1840	104.7	1881-1890	105.3		
1841-1850	104.5	1891-1895	105.7		
1851-1860	104.9	1901-1905	105.5		
1861-1870	105.0	1906-1910	106.4		
1871-1880	105.3	1911-1915	105.8		
1881-1890	105.3	1916-1920	106.1		
1891-1900	105.7	1921-1925	105.9		
1901-1905	105.5	1926-1930	105.4		
1906-1910	106.4	1931-1935	106.0		
1911-1915	105.8	1936-1940	105.6		
1916-1920	106.1	1941-1945	106.1		
1921-1925	105.9	1946-1950	106.2		
1926-1930	105.4	1951-1955	106.4		
1931-1935	106.0	1956-1960	106.4		
1936-1940	105.6	1961-1965	106.0		
1941-1945	106.1	1966-1970	106.2		
1946-1950	106.2	1971-1975	106.2		
1951-1955	106.4	1976-1980	105.7		
1956-1960	106.4	1981-1985	105.9		
1961-1965	106.0				
1966-1970	106.2				
1971-1975	106.3				
1976-1980	105.8				
1981-1985	105.4				

Sources:

- Sweden: Statistiska Centralbyran, Befolkningens Förändringar. Del. 3, 1968-1988; Befolkningstrenden, 1911-1950; Historical Statistics for Sweden, Part I: Population (1969).
- France: INSEE, Annuaire Statistique de la France, 1966; United Nations, Demographic Yearbook 1981, 1986.
- England and Wales: Great Britain. Office of Population Censuses and Surveys, The Registrar General's Statistical Review of England and Wales for the Year 1926, 1973. United Nations, Demographic Yearbook, 1981, 1986.

TABLE A3: SEX RATIO OF LIVE BIRTHS IN FRANCE 1820-1980. ANNUAL VALUES

<u>YEAR</u>	<u>SRB</u>	<u>YEAR</u>	<u>SRB</u>	<u>YEAR</u>	<u>SRB</u>	<u>YEAR</u>	<u>SRB</u>	<u>YEAR</u>	<u>SRB</u>	<u>YEAR</u>	<u>SRB</u>
1820	106.4	1850	105.5	1880	104.1	1910	104.4	1940	104.0	1970	105.4
1821	106.8	1851	104.6	1881	105.2	1911	104.1	1941	103.9	1971	105.3
1822	106.1	1852	105.3	1882	104.5	1912	104.9	1942	105.4	1972	105.6
1823	106.1	1853	106.1	1883	105.0	1913	104.7	1943	106.4	1973	105.6
1824	106.5	1854	105.4	1884	104.6	1914	103.8	1944	105.6	1974	105.6
1825	107.0	1855	105.6	1885	105.3	1915	104.7	1945	105.4	1975	105.1
1826	106.3	1856	105.3	1886	104.1	1916	104.8	1946	105.6	1976	105.3
1827	106.4	1857	105.2	1887	104.3	1917	104.7	1947	105.6	1977	105.5
1828	105.6	1858	105.0	1888	104.7	1918	106.6	1948	105.8	1978	105.4
1829	105.9	1859	105.3	1889	104.7	1919	105.9	1949	105.1	1979	105.4
1830	105.5	1860	104.8	1890	104.5	1920	106.2	1950	104.9	1980	105.3
1831	106.6	1861	105.0	1891	104.8	1921	104.9	1951	105.0	1981	105.5
1832	106.4	1862	105.2	1892	104.7	1922	104.9	1952	105.1	1982	105.5
1833	106.8	1863	104.9	1893	104.5	1923	105.3	1953	105.1	1983	105.2
1834	106.5	1864	105.4	1894	104.4	1924	104.6	1954	105.3	1984	105.0
1835	106.4	1865	105.1	1895	103.4	1925	105.0	1955	104.5	1985	105.3
1836	106.1	1866	105.3	1896	104.3	1926	104.4	1956	105.0		
1837	106.0	1867	105.1	1897	104.2	1927	104.3	1957	104.6		
1838	106.1	1868	104.8	1898	104.5	1928	104.9	1958	104.5		
1839	106.1	1869	105.0	1899	104.1	1929	104.5	1959	104.7		
1840	105.7	1870	106.8	1900	104.2	1930	103.9	1960	104.8		
1841	106.0	1871	104.9	1901	104.0	1931	104.3	1961	104.6		
1842	106.3	1872	104.9	1902	104.2	1932	104.4	1962	104.7		
1843	105.8	1873	105.0	1903	104.0	1933	103.9	1963	104.3		
1844	105.5	1874	105.3	1904	104.0	1934	104.1	1964	104.8		
1845	105.7	1875	105.2	1905	104.3	1935	103.9	1965	105.0		
1846	105.6	1876	104.6	1906	104.0	1936	103.5	1966	104.9		
1847	104.5	1877	104.5	1907	104.6	1937	103.9	1967	105.1		
1848	105.4	1878	104.8	1908	104.8	1938	104.1	1968	104.8		
1849	105.5	1879	104.5	1909	104.5	1939	103.7	1969	105.0		

Sources: Annuaire Statistique de la France, 1966; United Nations, Demographic Yearbook, 1981, 1986.

TABLE A4: PROPORTION OF FIRST BIRTHS, U.S.(WHITES), JAPAN

YEAR	U.S.(WHITES)	JAPAN
1918	.253	
1919	.225	
1920	.273	
1921	.273	
1922	.271	
1923	.265	
1924	.292	
1925	.294	
1926	.295	
1927	.300	
1928	.306	
1929	.311	
1930	---	
1931	.323	
1932	.309	
1933	.307	
1934	.321	
1935	.340	
1936	.347	
1937	.367	
1938	.375	
1939	.373	
1940	.366	
1941	.387	
1942	.408	
1943	.367	
1944	.336	
1945	.329	
1946	.374	
1947	.409	
1948	.367	
1949	.340	
1950	.316	
1951	.316	
1952	.301	
1953	.292	
1954	.285	
1955	.278	
1956	.278	
1957	.275	
1958	.270	
1959	.265	
1960	.263	
1961	.265	
1962	.268	
1963	.282	
1964	.298	
1965	.316	
1966	.348	
1967	.355	
1968	.379	
1969	.378	
1970	.386	
1971	.389	
1972	.397	
1973	.399	
1974	.417	
1975	.421	
1976	.422	
1977	.421	
1978	.426	
1979	.429	
1980	.436	
1981	.437	
1982	.430	
1983	.427	
1984	.422	
1985	.419	
1986	.418	
1987	.416	
1988	.413	

Sources:

United States: U.S. Department of Commerce, Bureau of the Census, Birth Statistics, 1915-1921: Births, Stillbirths, and Infant Mortality Statistics, 1922-1936; Vital Statistics of the United States, Part I, 1937-1939. U.S. Department of Health, Education and Welfare, Vital Statistics of the United States, 1970 (Vol. 1): U.S. Department of Health and Human Services, Vital Statistics of the United States, 1979 (Vol. 1), 1988 (Vol. 1).

Japan: United Nations, Demographic Yearbook, 1949-50, 1954, 1959, 1965, 1969, 1975, 1981, 1986. Ministry of Health and Welfare, Vital Statistics, Vol. 1, 1986-1988.

TABLE A5: TOTAL NUMBER OF LIVE BIRTHS IN EIGHT SELECTED POPULATIONS.
AVAILABLE DATA SINCE 1900. ANNUAL FIGURES

YEAR	SWEDEN	FRANCE	ENGLAND AND WALES	U.S. (WHITES)	U.S. (BLACKS)	JAPAN	TAIWAN	AUSTRALIA
1900		879,000	927,062			1,420,534		
1901	139,370	910,700	929,807			1,501,591		
1902	137,364	898,100	940,509			1,510,835		102,776
1903	133,896	878,300	948,271			1,489,816		98,443
1904	134,952	871,000	945,389			1,440,371		104,113
1905	135,409	859,000	929,293			1,452,770		104,941
1906	136,620	858,800	935,081			1,394,295	121,067	107,890
1907	136,793	823,800	918,042			1,614,472	124,091	110,347
1908	138,874	843,100	940,383			1,662,815	122,322	111,845
1909	139,505	819,100	914,472			1,693,850	130,084	114,071
1910	135,625	822,500	896,962			1,712,857	135,297	116,801
1911	132,997	788,100	881,138			1,747,803	139,333	122,193
1912	132,868	796,100	872,737			1,737,674	140,498	133,088
1913	130,200	790,400	881,890			1,757,441	141,379	135,714
1914	129,458	593,800	879,096			1,808,402	146,136	137,983
1915	122,997	387,000	814,614	763,889		1,799,326	142,505	134,871
1916	121,679	313,000	785,520	799,817	18,619	1,804,822	133,717	131,426
1917	120,855	342,500	668,346	1,280,288	71,139	1,812,413	148,209	129,965
1918	117,955	399,500	662,661	1,288,711	72,351	1,791,992	145,162	125,739
1919	115,193	403,500	692,438	1,269,363	95,516	1,778,685	142,310	122,290
1920	138,753	833,500	957,782	1,395,523	103,796	2,025,564	147,308	136,406
1921	127,723	811,800	848,814	1,565,446	138,495	1,990,876	161,987	136,198
1922	116,946	759,700	780,124	1,629,387	134,824	1,969,314	161,829	137,497
1923	113,435	761,300	758,131	1,644,034	137,654	2,043,297	154,079	135,222
1924	109,055	753,500	729,933	1,762,872	156,947	1,998,520	166,183	134,927
1925	106,292	770,100	710,582	1,731,669	136,499	2,086,091	166,091	135,792
1926	102,007	767,500	694,653	1,707,034	139,181	2,104,405	183,360	133,162
1927	97,994	743,800	654,172	1,925,585	202,672	2,060,737	185,195	133,698
1928	97,868	749,300	660,267	1,982,246	240,863	2,135,852	191,839	134,078
1929	92,861	730,100	643,673	1,924,475	235,133	2,077,026	197,967	129,480
1930	94,220	750,000	648,811	1,946,841	239,275	2,085,101	206,732	128,399
1931	91,074	733,900	632,081	1,848,293	234,203	2,102,784	217,136	118,509
1932	89,779	722,400	613,972	1,805,155	239,796	2,182,742	214,192	110,933
1933	85,020	678,700	580,413	1,794,946	246,277	2,121,253	221,350	111,269
1934	85,092	677,900	597,642	1,866,231	257,106	2,043,783	228,676	109,475
1935	85,906	640,500	598,756	1,888,012	255,124	2,190,704	235,945	111,325
1936	88,938	630,800	605,292	1,881,883	251,098	2,101,969	234,057	116,073
1937	90,373	618,100	610,557	1,928,437	262,462	2,180,734	247,666	119,131
1938	93,946	612,200	621,204	2,005,955	267,700	1,928,321	244,840	120,415
1939	97,380	612,400	614,479	1,982,671	270,060	1,901,573	254,153	122,891
1940	95,778	559,000	590,120	2,067,953	278,869	2,115,867	257,471	126,347
1941	99,727	520,000	579,091	2,204,903	294,554	2,277,283	253,305	134,525
1942	113,961	573,000	651,503	2,486,934	307,777	2,233,660	255,404	136,708
1943	125,392	613,000	684,334	2,594,763	324,865	2,253,535	260,663	149,295
1944	134,991	627,000	751,478	2,454,700	324,184			153,344
1945	135,373	643,000	679,937	2,395,563	324,264			160,560
1946	132,597	840,200	820,719	2,913,645	358,114			176,379
1947	128,779	866,600	881,026	3,274,620	406,957	2,678,792		182,384
1948	126,683	867,100	775,306	3,080,316	434,174	2,681,624		177,976
1949	120,947	868,600	730,518	3,083,721	453,235	2,696,638	300,843	181,261
1950	115,211	858,100	697,097	3,063,627	466,718	2,337,507	323,643	190,591
1951	110,168	822,800	677,529	3,237,072	489,282	2,137,689	385,383	193,298
1952	110,192	818,500	673,735	3,322,658	497,880	2,005,162	372,905	201,650
1953	110,144	801,100	684,372	3,356,772	517,576	1,868,040	374,536	202,235
1954	105,096	807,200	673,651	3,443,630	544,288	1,769,580	383,574	202,256
1955	107,305	802,300	667,811	3,458,448	558,251	1,730,692	403,683	207,677
1956	107,360	803,100	700,335	3,545,350	584,572	1,665,278	414,036	212,133
1957	107,168	812,600	723,381	3,621,456	596,050	1,566,713	394,870	220,358
1958	105,502	808,600	740,715	3,572,306	594,500	1,653,469	410,885	222,504
1959	104,743	825,600	748,501	3,597,430	605,962	1,626,088	421,458	226,976
1960	102,219	816,300	785,005	3,600,744	602,264	1,606,041	419,442	230,326
1961	104,501	835,200	811,281	3,600,864	611,072	1,589,372	420,254	239,986
1962	107,284	828,900	838,736	3,394,068	584,610	1,618,616	423,469	237,081
1963	112,903	865,300	854,055	3,326,344	580,658	1,659,521	424,250	235,689
1964	122,644	874,200	875,972	3,369,160	607,556	1,716,761	416,926	229,149
1965	122,806	863,100	862,725	3,123,860	581,126	1,823,697	406,604	222,854
1966	123,354	863,500	849,823	2,993,230	558,244	1,360,974	415,108	222,626
1967	121,360	840,600	832,164	2,922,502	543,976	1,935,647	374,282	229,296
1968	113,087	835,800	819,272	2,912,224	531,152	1,871,839	394,260	240,906
1969	107,622	842,200	797,538	2,993,614	543,132	1,889,815	390,728	250,176

TABLE A5, CONTINUED

YEAR	SWEDEN	FRANCE	ENGLAND AND WALES	U.S. (WHITES)	U.S. (BLACKS)	JAPAN	TAIWAN	AUSTRALIA
1970	110,150	847,800	784,486	3,091,264	572,962	1,934,239	394,015	257,516
1971	114,484	881,300	783,155	2,919,746	564,960	380,424	380,424	276,362
1972	112,273	877,500	725,440	2,655,558	531,329	2,038,662	365,749	266,969
1973	109,663	857,200	675,953	2,551,030	512,597	2,091,983	366,942	247,670
1974	109,874	801,200	639,885	2,575,792	507,162	2,029,989	367,823	245,177
1975	103,362	745,100	603,445	2,551,996	511,581	1,901,440	367,647	233,012
1976	98,345	720,400	584,270	2,567,414	514,779	1,832,617	424,075	227,810
1977	96,057	744,700	569,259	2,691,070	544,221	1,755,100	393,633	226,291
1978	93,248	737,100	596,418	2,681,116	551,340	1,708,643	411,637	224,181
1979	96,255	757,400	638,028	2,808,420	577,855	1,642,580	421,720	223,129
1980	97,064	800,400	656,234	2,898,722	589,616	1,576,889	411,893	225,527
1981	94,150	805,483	634,492	2,908,669	587,797	1,529,455	414,508	235,842
1982	92,706	797,223	625,931	2,942,054	592,641	1,515,392	401,905	239,903
1983	91,780	748,525	629,134	2,904,250	586,027	1,508,687	381,029	242,570
1984	93,889	759,939	636,818	2,923,502	592,745	1,489,780	368,812	238,472
1985	98,463	768,431	656,417	2,991,373	608,193	1,431,577	342,959	242,910
1986	101,740	768,431	656,417	2,970,439	621,221	1,382,946	306,328	
1987	104,657			2,992,488	641,567	1,346,658	313,282	
1988	112,005			3,046,162	671,976	1,314,006	342,227	

Sources:

Sweden: Statistiska Centralbyrån, Befolkningens Förändringar, Del. 3, 1968-1988; Befolkningstrenden (1969).

France: INSEE, Annuaire Statistique de la France, 1966; United Nations, Demographic Yearbook, 1981, 1986.

England and Wales: Great Britain, Office of Population Censuses and Surveys, The Registrar General's Statistical Review of England and Wales for the Year 1926, 1973, United Nations, Demographic Yearbook, 1981, 1986.

United States: U.S. Department of Commerce, Bureau of the Census, Birth Statistics, 1915-1971; Births, Stillbirths, and Infant Mortality Statistics, 1922-1936; Vital Statistics of the United States, Part I, 1937-1939; U.S. Department of Health, Education and Welfare, Vital Statistics of the United States, 1970 (Vol. 1); U.S. Department of Health and Human Services, Vital Statistics of the United States, 1979 (Vol. 1), 1988 (Vol. 1).

Japan: Ministry of Health and Welfare, Vital Statistics, Vol. 1, 1982-1988.

Taiwan: Statistical Abstract of Taiwan, 1894-1946; Ministry of the Interior, Taiwan Demographic Fact Book, Republic of China 1972; Taiwan-Fukien Demographic Fact Book, Republic of China 1982-1988.

Australia: Pollard (1969); United Nations, Demographic Yearbook, 1981, 1986.

TABLE A6: TOTAL NUMBER OF LIVE BIRTHS IN SWEDEN, FRANCE AND ENGLAND AND WALES SINCE 1750. TEN-YEAR OR FIVE-YEAR AVERAGES

PERIOD	LIVE BIRTHS	PERIOD	LIVE BIRTHS	PERIOD	LIVE BIRTHS
1751-1760	66,421	1806-1810	923,900	1871-1880	858,878
1761-1770	67,733	1811-1815	930,700	1881-1890	889,024
1771-1780	67,426	1816-1820	971,800	1891-1900	915,515
1781-1790	68,981	1821-1825	976,600	1901-1905	938,654
1791-1800	76,033	1826-1830	974,900	1906-1910	920,988
1801-1810	74,083	1831-1835	976,600	1911-1915	865,895
1811-1820	82,531	1836-1840	976,600	1916-1920	753,349
1821-1830	95,326	1841-1845	976,000	1921-1925	765,517
1831-1840	94,836	1846-1850	976,600	1926-1930	660,297
1841-1850	102,833	1851-1855	939,800	1931-1935	604,573
1851-1860	119,419	1856-1860	967,400	1936-1940	608,330
1861-1870	128,107	1861-1865	1,005,000	1941-1945	669,269
1871-1880	133,730	1866-1870	998,000	1946-1950	780,933
1881-1890	135,820	1871-1875	981,100	1951-1955	675,420
1891-1900	133,873	1876-1880	993,700	1956-1960	739,587
1901-1905	136,198	1881-1885	983,800	1961-1965	848,554
1906-1910	137,483	1886-1890	930,100	1966-1970	816,657
1911-1915	129,704	1891-1895	905,800	1971-1975	685,576
1916-1920	122,887	1896-1900	899,700	1976-1980	608,842
1921-1925	114,690	1901-1905	883,500	1981-1985	636,558
1926-1930	96,990	1906-1910	833,500		
1931-1935	87,374	1911-1915	771,300		
1936-1940	93,283	1916-1920	438,400		
1941-1945	121,889	1921-1925	771,300		
1946-1950	124,843	1926-1930	748,100		
1951-1955	108,581	1931-1935	690,700		
1956-1960	105,398	1936-1940	606,500		
1961-1965	114,032	1941-1945	595,200		
1966-1970	115,115	1946-1950	860,100		
1971-1975	109,985	1951-1955	810,400		
1976-1980	96,194	1956-1960	813,200		
1981-1985	94,198	1961-1965	853,300		
		1966-1970	846,000		
		1971-1975	832,500		
		1976-1980	752,000		
		1981-1985	775,920		

Sources: Sweden: Statistiska Centralbyran, Befolkningens Förändringar, Del. 3, 1968-1983; Befolkningstälsten, 1911-1950; Historical Statistics for Sweden, Part I: Population (1969).
 France: INSEE, Annuaire Statistique de la France, 1966; United Nations, Demographic Yearbook, 1981, 1986.
 England and Wales: Office of Population Censuses and Surveys, The Registrar General's Statistical Review of England and Wales for the Year 1976, 1973. United Nations, Demographic Yearbook, 1981, 1986.

TABLE A7: TOTAL NUMBER OF LIVE BIRTHS IN FRANCE 1820-1985. ANNUAL FIGURES

YEAR	LIVE BIRTHS	YEAR	LIVE BIRTHS	YEAR	LIVE BIRTHS	YEAR	LIVE BIRTHS	YEAR	LIVE BIRTHS	YEAR	LIVE BIRTHS
1820	960,000	1850	954,200	1880	970,200	1910	822,500	1940	559,000	1970	847,800
1821	964,400	1851	971,300	1881	987,200	1911	788,100	1941	520,000	1971	881,500
1822	972,600	1852	965,000	1882	985,100	1912	796,100	1942	573,000	1972	877,500
1823	963,300	1853	937,000	1883	986,600	1913	790,400	1943	613,000	1973	857,200
1824	984,200	1854	923,500	1884	987,400	1914	593,800	1944	627,000	1974	801,200
1825	973,500	1855	902,300	1885	972,900	1915	387,000	1945	643,000	1975	745,100
1826	992,300	1856	952,100	1886	961,100	1916	313,000	1946	840,200	1976	720,400
1827	980,100	1857	940,700	1887	947,700	1917	242,500	1947	866,600	1977	744,700
1828	976,900	1858	969,300	1888	929,800	1918	399,500	1948	867,100	1978	737,100
1829	965,500	1859	1,017,900	1889	927,700	1919	403,500	1949	868,600	1979	757,500
1830	968,000	1860	956,900	1890	884,300	1920	833,500	1950	858,100	1980	800,400
1831	986,800	1861	1,005,100	1891	915,200	1921	811,800	1951	822,800	1981	805,483
1832	937,400	1862	995,200	1892	903,300	1922	759,700	1952	818,500	1982	797,223
1833	970,200	1863	1,012,800	1893	923,500	1923	761,300	1953	801,100	1983	748,525
1834	986,500	1864	1,005,900	1894	903,400	1924	753,500	1954	807,200	1984	759,939
1835	993,800	1865	1,005,800	1895	883,600	1925	770,100	1955	802,300	1985	768,431
1836	979,700	1866	1,006,300	1896	915,900	1926	767,500	1956	803,100		
1837	943,700	1867	1,003,800	1897	909,700	1927	743,800	1957	812,600		
1838	963,200	1868	984,100	1898	894,200	1928	749,300	1958	808,600		
1839	958,200	1869	999,800	1899	899,600	1929	750,100	1959	825,600		
1840	952,400	1870	995,900	1900	879,000	1930	750,000	1960	816,300		
1841	976,800	1871	871,600	1901	910,700	1931	733,900	1961	835,200		
1842	983,000	1872	1,020,100	1902	898,100	1932	722,400	1962	828,900		
1843	978,400	1873	999,200	1903	878,300	1933	678,400	1963	865,300		
1844	959,500	1874	1,009,000	1904	871,000	1934	677,900	1964	874,200		
1845	982,500	1875	1,005,700	1905	859,600	1935	640,500	1965	863,100		
1846	965,900	1876	1,022,000	1906	858,800	1936	630,800	1966	863,500		
1847	901,900	1877	998,000	1907	823,800	1937	618,100	1967	840,600		
1848	940,200	1878	990,000	1908	843,100	1938	612,200	1968	835,800		
1849	985,800	1879	988,300	1909	819,100	1939	612,400	1969	842,200		

Sources: Annuaire Statistique de la France, 1966; United Nations, Demographic Yearbook, 1981, 1986.