

# SEASONALITY OF COITUS AND SEASONALITY OF BIRTH

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## RESUMEN

*En todas las poblaciones estudiadas se ha observado que hay una variación estacional en la tasa de natalidad. Se han adelantado muchas hipótesis para explicar esta variación, incluyendo una variación estacional en la frecuencia del coito. Se sabe que ésta relación es cierta para otros primates, pero en el hombre, no se ha documentado anteriormente una variación estacional en la tasa de coitos.*

*Este trabajo presenta datos equivalentes a más de cien años-mujer sobre tasas de coito, correspondientes a cincuenta mujeres voluntarias, de raza blanca, en su mayor parte bien educadas, en edad pre-menopáusica, casadas y con esposo presente. Se encontró que había fluctuaciones estacionales en las tasas de coito, más o menos de la misma magnitud que las variaciones estacionales en las tasas de nacimientos de blancos, que se han informado para la ciudad de New York 1962-1964; para los Estados Unidos 1963; y para el quintillo socioeconómico más alto de las divisiones censales, Baltimore, 1952-1956. Sin embargo al desplazar las tasas de nacimientos cuarenta semanas para aproximarlas a las fechas de la concepción, no se pudo demostrar alguna asociación con las tasas de coito observadas.*

*Si el esquema presentado tiene posibilidades de generalización, las variaciones estacionales en los nacimientos no pueden ser explicadas por variaciones estacionales en el coito.*

## SUMMARY

*Seasonal variation of birth rates has been observed in every population in which it has been studied. Many hypotheses have been advanced to account for the variation, including seasonal variation in frequency of coitus. This relationship is known to be true for other primates, but seasonal variation in coital rate has not been previously documented in man.*

*This paper presents over one hundred woman-years of data on coital rates from about fifty white, mostly well-educated, premenopausal, married, husband-present volunteers. Seasonal fluctuations were seen in coital rates, of about the same magnitude as seasonal variations in the white birth rates reported for New York City, 1962-64; for the United States, 1963; and for the highest socioeconomic quintile census tracts, Baltimore, 1952-56. However, shifting the birth rates back forty weeks to approximate conception dates revealed no association with the observed coital rates.*

*If the pattern presented has great generality, seasonal variations in births cannot be explained by seasonality of coitus.*

Seasonal variation of birth rates has been observed in every population in which it has been studied. Huntington's monograph on the subject<sup>1</sup> showed that the observed seasonal fluctuations were related to climate, work patterns, festivals, and a number of other variables, with different patterns of seasonality ob-

served in different countries, in different cultural groups within countries, in the same country during different centuries, and in different geographic areas within countries. Subsequent publications have shown similar variations.<sup>2</sup> A variety of

\* University of North Carolina. This study was supported by grants from the United States Children's Bureau (P.H. 300), the Public Health Service Research Grant No. FR-5450-05 from the School of Public Health, University of North Carolina, and the Carolina Population Center. Thanks are due Paul Gebhard and the Institute for Sex Research, Indiana University, for putting at our disposal data from the files of the institute. Charles Chase gets credit for organizing the data processing.

<sup>1</sup> Ellsworth Huntington, *Season of Birth* (New York: John Wiley and Sons, 1938).

<sup>2</sup> K. S. F. Chang, S. T. Chan, W. D. Low, and C. K. Ng, "Climate and Conception Rate in Hong Kong," *Human Biology*, XXXV (September, 1963), 366-76; Ursula M. Cowgill, "Recent Variations in the Season of Birth in Puerto Rico," *Proceedings of the National Academy of Sciences*, LII (November, 1964), 1149-51; D. D. Kosambi and S. Raghavachari, "Seasonal Variation in the Indian Birth Rate," *Annals of Eugenics*, XVI (September, 1951), 165-92; Benjamin Pasamanick, Simon Dinitz, and Hilda Knobloch, "Geographic and Seasonal Variations in Births," *Public Health Reports*, LXXIV (April, 1959), 285-88; Harry M. Rosenberg, *Seasonal Variation of Births, United States 1933-1963*, Series 21, No. 9 (Washington, D.C.: National Center for Health

hypotheses can be stated to account for seasonal variations in birth rates. Frequency of coitus might vary seasonally for several reasons. Men and women might be separated by seasonal work migrations, for example, or rates might be increased or depressed by seasonally occurring festivals or religious events. Again, weather conditions might directly affect people's interest in or capacity for coitus or might indirectly affect coital rates through changes, say, in opportunities for privacy.

Coital rates might not vary seasonally, but birth rates might vary in response to changes in the probability of ovulation, and coitus, changes in the probability of implantation after conception, or changes in the probability of a recorded vital event after implantation. Various writers have offered hypotheses on the relation of climate to changes in these probabilities, but there is almost no data which can be used either to eliminate or to support any of them.

This paper is addressed to the possible relationship between coital rates and birth rates. It is well known that other primates have highly seasonal birth rates and that these birth rates are related to seasonality of sexual behavior.<sup>3</sup> Writers on humans have not been very explicit in stating their hypotheses with respect to variations in rates of sexual behavior. Seasonal variations of marriage rates have often been offered as a possible determinant of seasonal variations in births, but this has never been shown to account for the phenomenon.<sup>4</sup> Huntington speaks of climato-

logical factors having "a stimulating effect upon reproduction,"<sup>5</sup> by which he presumably means that coital activity is stimulated. Other writers have referred to effects on the "vitality and energy of the people,"<sup>6</sup> from which one may infer something about sexual activity. In reference to contemporary American conditions, Erhardt, Nelson, and Pakter state, "although humans, unlike most other animals, appear to indulge in coitus as frequently at one season as another, this practice does not preclude that nature controls fecundity seasonally by some other mechanism."<sup>7</sup>

This paper presents seasonal data on coital rates for one group of women which can be compared to known seasonal birth rates. It has probably seemed impractical to most researchers to collect coital calendars from a large sample of women over many months in order to help solve the riddle of seasonality of births. In the process of exploring other problems related to cyclicity of sexual behavior, we obtained about fifty coital calendars representing more than a hundred woman years from the files of the Institute for Sex Research Indiana University. The analysis presented below is based on these calendars.

The women whose behavior is reported here are all white, mostly well-educated premenopausal, married, husband-present. They are all volunteers and do not represent any population beyond themselves. Records were maintained by the women on a day-to-day basis and were collected by the institute yearly or less often. We identified each event by date called Monday through Sunday a week and identified the first week, the week in which January 1 fell. We considered the mean observed weekly frequency to be the expected frequency.

Figure 1 presents the ratio of observed to expected coital rates for each week in the year, plotted on a three week moving

Statistics, 1966); and Benjamin Pasamanick, Simon Dinitz, and Hilda Knobloch, "Socio-economic and Seasonal Variations in Birth Rates," *Milbank Memorial Fund Quarterly*, XXXVIII (July, 1960), 248-54.

<sup>3</sup> Irven DeVore, ed., *Primate Behavior, Field Studies of Monkeys and Apes* (New York: Holt, Rinehart and Winston, 1965).

<sup>4</sup> Huntington, *op. cit.*; Carl L. Erhardt, Frieda G. Nelson, and Jean Pakter, "Seasonal Patterns of Conception in New York City" (paper presented to the Population Association of America [Cincinnati, 1967]); and Pasamanick *et al.*, *Public Health Reports*, *op. cit.*

<sup>5</sup> Huntington, *op. cit.*, pp. 59-60.

<sup>6</sup> Kosambi and Raghavachari, *op. cit.*

<sup>7</sup> Erhardt, *et al.*, *op. cit.*

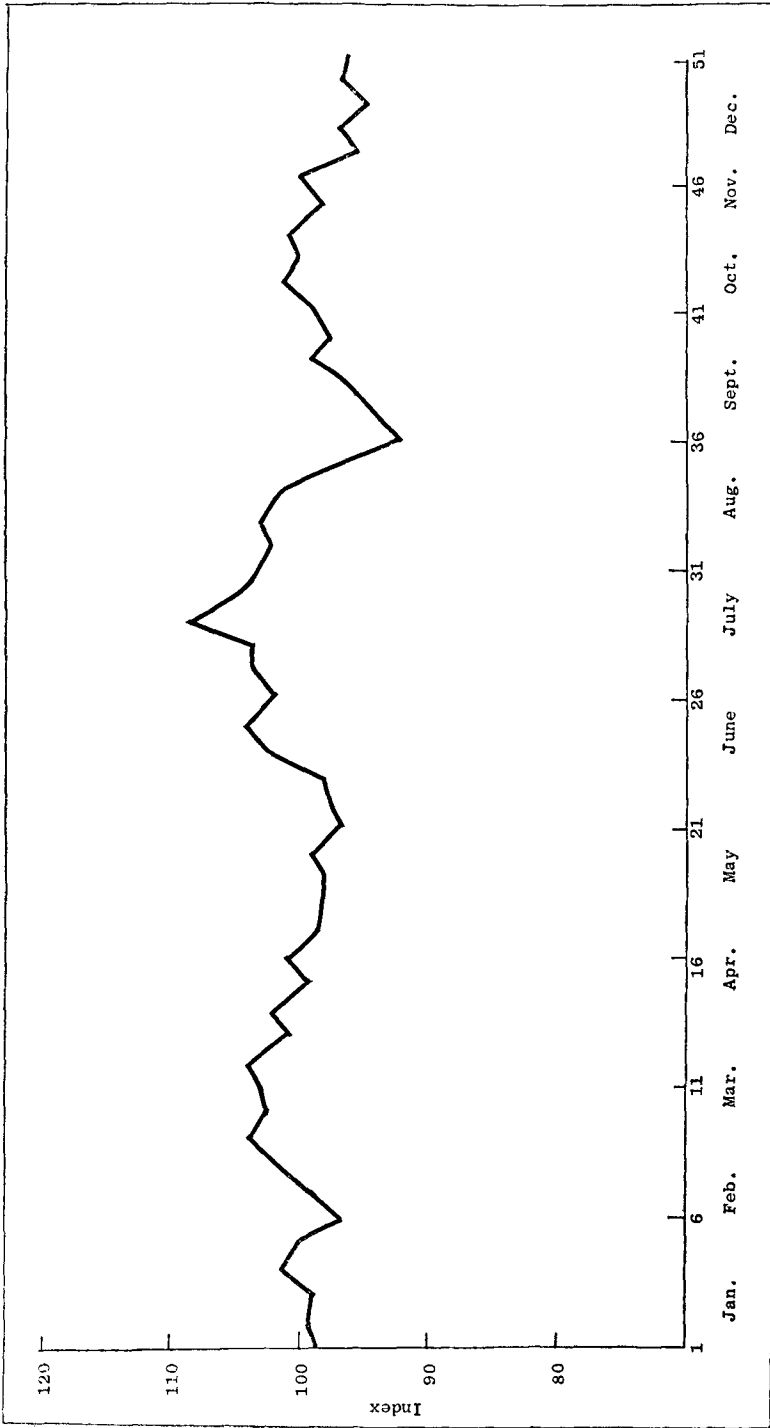


FIG. 1.—Coital rates, by week of the year (ratio of observed to expected frequency). Three-week averages

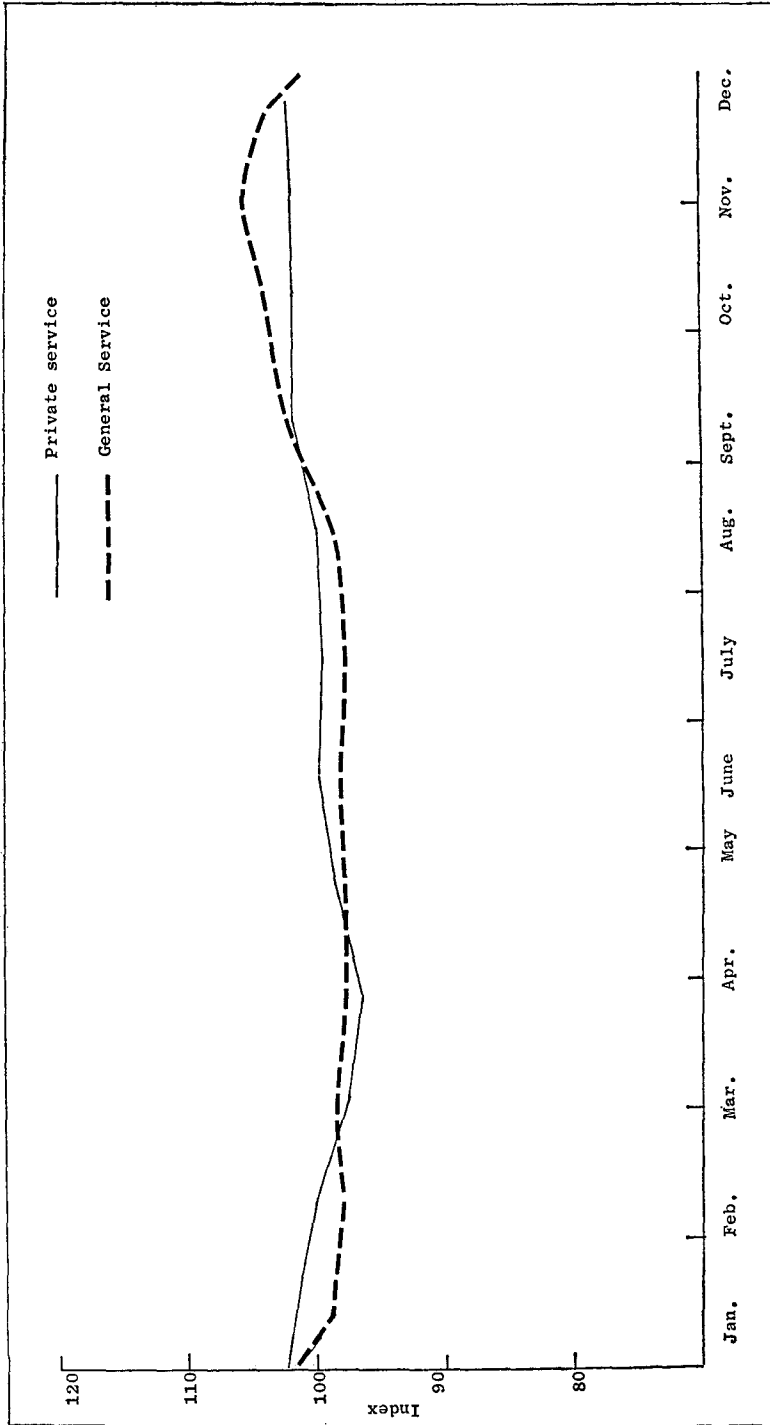


FIG. 2.—Ratio of observed to expected white conceptions, by hospital service, for New York City, 1962-64. SOURCE: Erhardt, Nelson, and Pakter, *op. cit.*

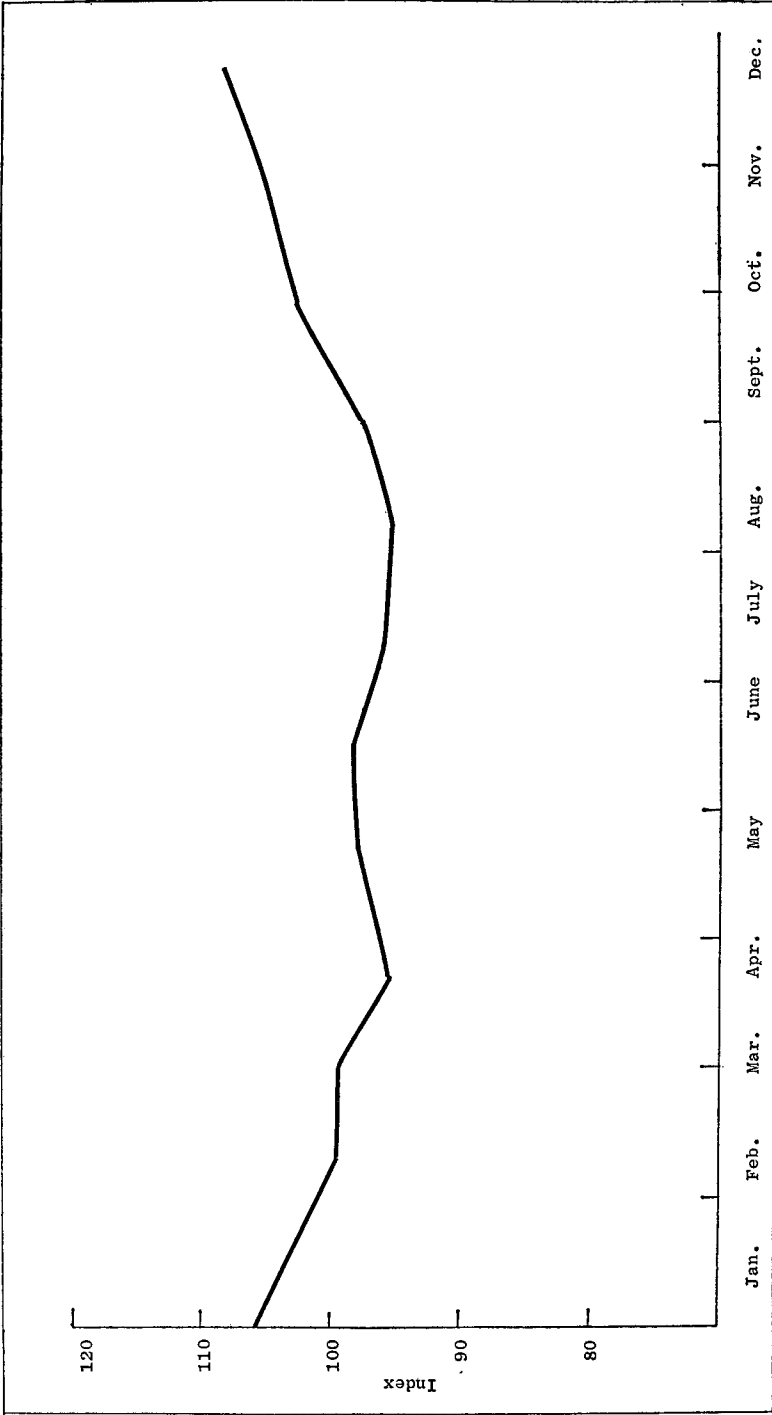


FIG 3.—Ratio of observed to expected white births, for the United States, 1963 (back-dated 40 weeks). SOURCE: Rosenberg, *op. cit.*, p. 21, Table 1

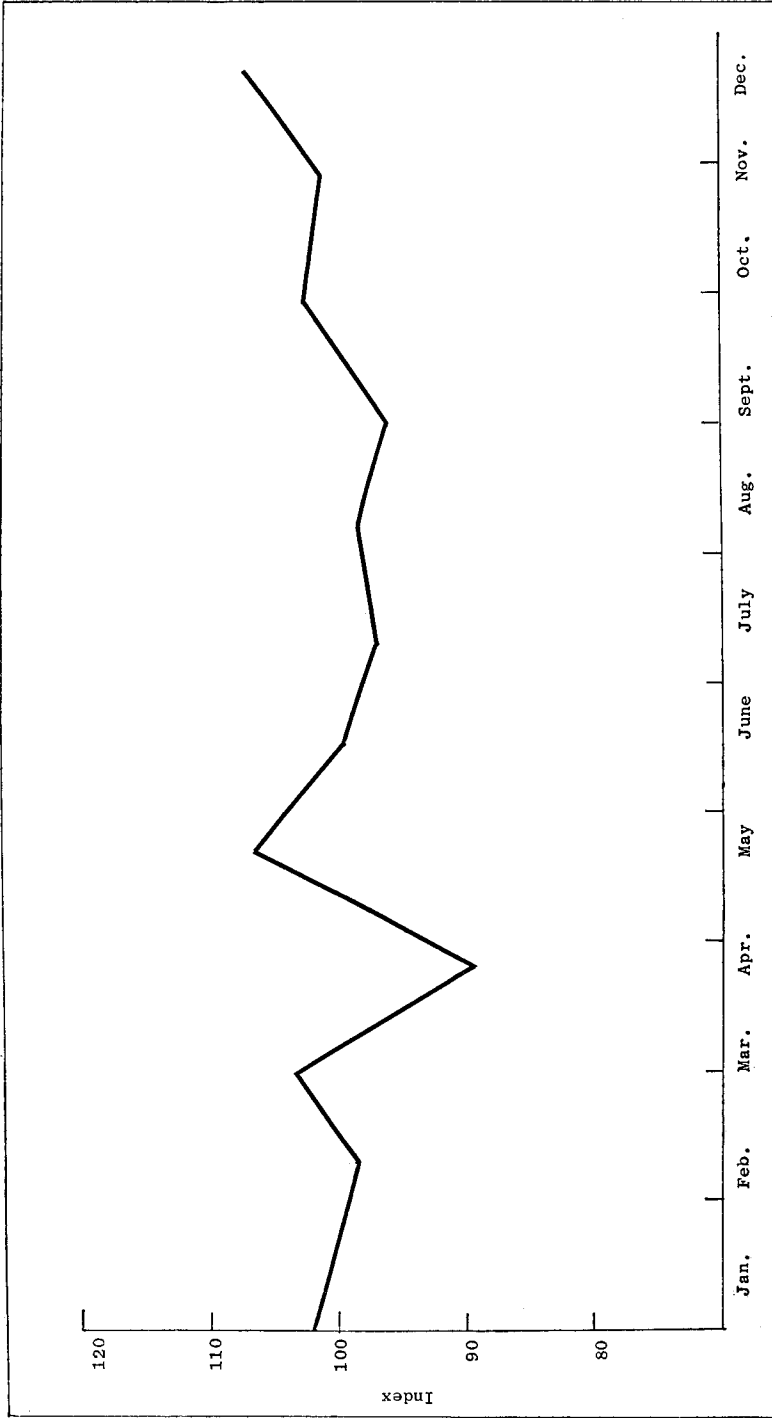


FIG. 4.—Ratio of observed to expected white births in the highest socioeconomic quintile census tracts of Baltimore, 1952-56 (back-dated 40 weeks). SOURCE: Pasamanick, Dinitz, and Knobloch, *op. cit.*

average. The fluctuations in coital rates are of about the same magnitude as seasonal variations in birth rates. But do the coital frequency variations correspond to birth seasonality? Figure 2 presents data from Erhardt, Nelson, and Pakter on white conceptions by hospital service. Figure 3 presents seasonal variations in the 1963 white, United States live-birth rate, plotted by shifting dates back forty weeks. Since our coital data are drawn from high-status whites, we offer for comparison Figure 4, giving the seasonal variation in white live births occurring in the upper quintile socioeconomic level of census tracts in Baltimore from 1952 to 1958.<sup>8</sup> As

<sup>8</sup> Pasamanick *et al.*; *op. cit.*

can be seen, there is no way of reconciling the coital rates in Figure 1 with the seasonal variations shown in Figure 2, 3, or 4.

To sum up, then, the coital rates presented show seasonal variation, but this variation is not associated with any other known events. We do not have any way of knowing whether our data portray a seasonal pattern of coitus more general than the observations from which it is calculated. If this pattern has great generality, it would be interesting for other reasons to explain its ups and downs, but seasonal variations in births would still need to be explained by something other than seasonality of coitus.