

TRENDS AND FACTORS OF THE TWINNING RATE. THE CASE OF FRANCE DURING THE TWENTIETH CENTURY

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The proportion of deliveries which are twin deliveries has varied in France over the twentieth century (figure 1). The civil registration data show that in the first half of the century, the incidence of twin deliveries was about 1 per 100, a proportion which did not significantly vary, except during World War I, when the twinning rate temporarily rose. In the 1960s, the proportion of twin deliveries declined, reaching a low 8.9 per 1,000 in 1972. The rate then began to climb again and by 1987, it had risen back to the level of the first half of the century. However, the upward trend did not stop there, and even gained momentum: by 1998, the twinning rate had reached 15.0 per 1,000, a 69% increase compared with 1972. The same downwards and upwards trends were observed in most developed countries. What is the explanation? The twinning rate depends on many different factors: age at childbearing, sterility treatments, family planning, etc. Which role each of them has played in the changes of the twinning rate?

The mean age of mothers has varied over the twentieth century in France (figure 2). In 1900, the mean age was close to 29.5; it then fell to 28 in the 1950s and 26.5 in 1977. A rapid increase followed and by the end of the 1990s, the average age was over 29. Twinning rate fluctuations are partly linked to modifications in childbirth schedules. Indeed, older women tend to have twins more often than younger women. The twinning high of World War I is thus partly due to the rise in the mean age of women at childbirth during wartime. Between 1910 and 1914, the average was close to 29; the outbreak of the war prompted a sudden increase, up to almost 30, between 1915 and 1919. After the war, the rate dropped back to prewar levels. Conversely, when the mean childbearing age fell, as in the 1960s and 1970s, the twinning rate declined as well. Similarly, when the mean age at childbirth increased at the end of the 1970s, the twinning rate rose as well. However, early or late childbearing only accounts for one aspect of twinning incidence variations. Thus, the peak level of the twinning rate during WWI is probable also due to the fact that couples who conceived during war years were among the more fertile. Many men were fighting at the front, and a high proportion of conceptions occurred during leaves. These leaves were very short, and the couples that did manage to conceive were the most fertile. Children born to hyperfertile women thus represented a larger proportion of births than they did in peace time. If we make the hypothesis that hyperfertile women are those who have fraternal twins, we explain the peak of the twinning rate during WWI.

From the opposite angle, the drop in the twinning rate observed in the 1960s was not only due to the fact that mothers had their children at a younger age; the age factor being equal, the twinning rate also decreased. An overall decline in the fertility rate occurred at that time, and large families were few. A twin delivery is an unexpected event in the life course of a family. It may disturb the family plans and modify the desire for other children. In which direction? Do women who delivered twins get less frequently pregnant subsequently than those who delivered single birth? How many children they have in total? Is the gain of one more child

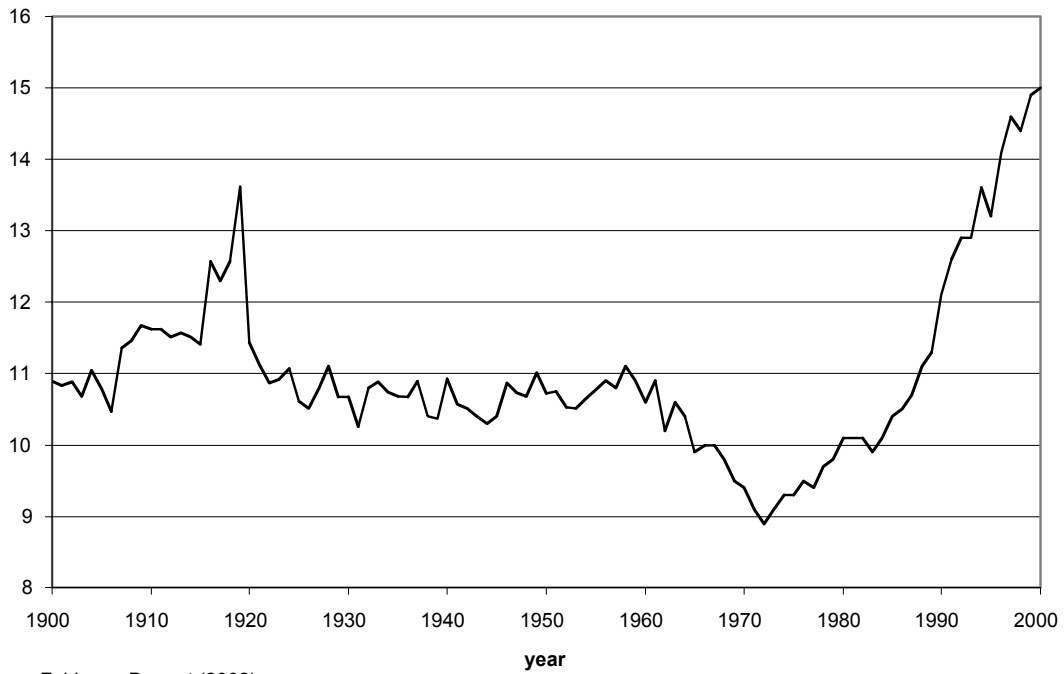
for the first ones, if compared to the second ones, suppressed by a lower number of pregnancies on the whole ? Did this behaviour of mothers who deliver twins changed over the last century, with the increasing fertility control ? Did these changes had an effect on the proportion of twin deliveries in the whole population.

To answer these questions and examine more in detail the effect of family planning on the twinning rate, we have studied the consequences of the arrival of twins on the size and composition of a family, and more specifically, the fertility after a twin delivery using data from a recent biographic survey in France . It is expected that women whose first children were twins reached upon the first pregnancy—or the second, for those who wanted three children—the desired number of children. These women are less likely to have subsequent pregnancies than those who have had the same number of pregnancies, but no twins. Thus, women predisposed to having twins are less and less represented in birth orders following the first, since they are more likely to control their pregnancies: as a result, the twinning rate decline. To verify whether this is the case, we have analysed 278 000 biographies of women representative of the French female population aged 15 years or more who were interviewed in 1999. The analysis demonstrates that women who have given birth to twins are less involved in other pregnancies than women who have had a simple birth, if we compare women of the same age at the last pregnancy and who have had the same number of pregnancies. If we now consider the number of children born, the vision is slightly different. If the twins arrive at the first pregnancy, the probability of a new pregnancy is practically equal to the one of women who have had two children in two simple pregnancies. In all cases, the women have two children, no matters apparently if it is in one or two pregnancies. Though, for the women with three children, those whose first pregnancy was simple and the second twin, are less involved in a new pregnancy than those who had a first twin pregnancy followed by a simple pregnancy, or those who had three simple pregnancies (as it is usually the case). In these two last situations, the probabilities of another delivery are moreover similar too: it is the matter in the two cases of families who wanted at least three children. Though, women who had a first simple pregnancy followed by a twin pregnancy didn't all want three children, a part of them wanted only two children and the twin pregnancy, who was not foreseen, perturbed the initial project by adding a supplementary child.

The last factor examined in the communication is sterility treatments. In France, at the end of the 1970s, the rise in the childbearing age contributed to the increase in the proportion of twin deliveries, but only in part. Indeed, another important factor to be taken into account is the introduction of sterility treatments. French physicians began to prescribe hormone treatments to stimulate ovulation in 1967. However, not only do these treatments make it possible for hypofertile women to conceive, they also significantly increase the likelihood of multiple pregnancies. These treatments have become so popular that today, in France, about 500,000 menstrual cycles are stimulated each year, in addition to those stimulated for in vitro fertilization (IVF). IVFs are suggested to women when ovarian stimulations are unsuccessful. The first French "test tube" baby was born in 1982. Since then, the number of IVFs performed each year has dramatically increased, reaching 20,000 per year in the early 90s and 50,000 per year today. In order to improve the likelihood of success, physicians practicing in vitro fertilization often implant several ova or several embryos at once—2.3 on average in 2001. However, this procedure involves a high risk of multiple births. Almost one out of four IVF pregnancies leads to the birth of twins, as opposed to one in 100 for natural pregnancies. The growing frequency of sterility treatments accounts for two thirds of the increase in the twinning rate during the last thirty years, the remaining third being due to the fact that women tend to have their children later in life.

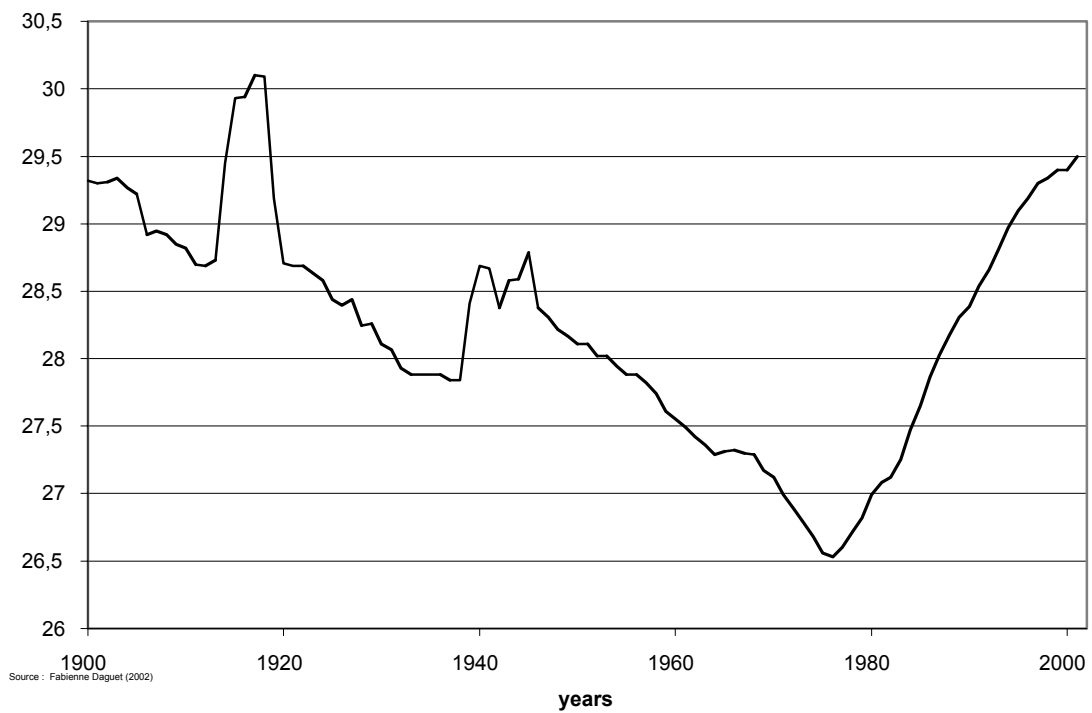
The conclusion tries a synthesis of the different factors playing a role in the evolution of the frequency of twin pregnancies during the twentieth century by examining more particularly the role of the fall of fecundity and the rarefaction of non desired births, whose effect was to reduce the incidence of twin births, and the role of the development of treatments against sterility during the last thirty years, that on contrary contributed to increase it.

Figure 1 – Twinning rate in France from 1900 to 2000



Source : Fabienne Daguet (2002)

Figure 2 – Mean age at childbearing - France - 1900 to 2000



Source : Fabienne Daguet (2002)