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Sandra BRÉE*

Changes in Family Size over the Generations in France (1850-1966)

To chart fertility over a long period, demographers and historians have often used synthetic indicators such as completed fertility or total fertility rate. These indicators describe an average number of children per woman for a cohort or a period of time, but do not track changes in family size. Has the percentage of childless women evolved over time? What is the share of families with four children? Through a meticulous comparison of the questions and data from eight population censuses and family surveys, Sandra BRÉE describes the changes in the family size of women born between the 1850s and the 1960s, spanning more than a century of cohorts. She shows that large families began to decline in the late nineteenth century, that levels of childlessness varied over the period, and that the share of families with two children began to increase with the cohorts born in the 1920s. This study highlights the benefits of associating indicators of mean fertility with measures of parity.

The history of French fertility since the nineteenth century is now well known. However, the distribution of women's lifetime number of children, in other words, their family size or parity, is rarely mentioned. Fertility tends to be approached through the mean number of children born to each woman (completed fertility for cohorts, and total fertility rate for period analysis) and through age-specific fertility rates, but these averages are rarely broken down to describe how many women had no children, one child, two children, etc. An analysis of averages conceals the specific trend of each family size. Is the decline in completed fertility attributable to the increasing rarity of large families or to a higher frequency of small families? And what is the impact of childlessness on completed fertility?

Authors who have analysed the fertility of French cohorts over the long term (Daguet, 2002; Festy, 1979; INED, 1991; Sardon, 1990; Toulemon, 2001) have mainly worked with aggregate civil registration data (using the number

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of births as the numerator) and census results (using the number of women as the denominator). These aggregate data can be used to describe fertility trends, but not to determine the exact number of children born to women by the end of their reproductive lives.⁽¹⁾ However, as Patrick Festy stresses (1979, p. 96), “changes in family size are central to the explanation”. Only Laurent Toulemon (1995, 2001) has used family surveys to estimate the fertility of the cohorts born around 1930 and to calculate family sizes. Furthermore, these studies rarely distinguish between ever-married and never-married women.

Consequently, there is no comparative research on cohort fertility going back to the cohorts of the 1850s that uses a retrospective method and differentiates between the fertility of ever-married women (including widows and divorcees)⁽²⁾ and that of women who were never-married at age 45. This article begins with a review of the available sources and data, and of the methods used to analyse the fertility of the cohorts born in France between 1850 and 1965. It then examines fertility changes over a long period based on family size and then on parity progression ratios. The simultaneous study of changes in family size and completed fertility improves our understanding of fertility trends and, more specifically, the impact of each family size on the pattern of overall fertility.

I. Sources and method used to measure family size

The retrospective method for estimating fertility uses data on the reported number of children born to women aged 45 and over during their reproductive lives. Questions on the number of children have not always been asked in censuses in France or elsewhere (Eggerickx and Begeot, 1993); France is rather unique in that regard – the censuses of 1906, 1931 and 1946 all included the question “How many children have you had?”⁽³⁾ In 1931 and 1946, the question on family size was asked of married, widowed and divorced women and of widowed men (and of household heads in 1906). This information is valuable for analysing fertility. From 1954 onwards, the question was included in a separate “Family survey” (Enquête famille, also called Étude de l’histoire familiale in 1999 and Enquête famille et logements in 2011), as recommended by Louis Henry (1953). Henry suggested that detailed analysis of fertility should

(1) Patrick Festy’s vast study (1979) of fertility in Western countries between 1870 and 1970 was based on a diagonal reading of five-year age-specific fertility rates collected by Pierre Depoid (1941) to estimate the fertility of French cohorts, a method that Fabienne Daguët (2002) also applied to the data from INED’s report on the demographic situation of France in 1974 (INED, 1976).

(2) Reproductive life is generally measured between the ages of 15 and 50. It was limited here to age 45 (also commonly used) so that another five-year cohort could be included in the analysis with almost no impact on the results (because very few children are born to women aged 45-50).

(3) The question “How many children do you have?” is asked in the censuses starting in 1886 but only provides information about surviving children, not all live-born children, which can create a considerable bias (for Paris, see Brée, 2011, 2017). For a history of family statistics, see the first chapter on family statistics from the 1946 French population census (INSEE, 1946, pp. VIII-XII).

be based on “the entire history of the family [collected by means of] specific surveys” (Henry, 1953, pp. 489-490), but that the question “How many children do you have?” should be kept in the five-year population censuses to provide statistics on families receiving family allowances based on their number of dependent children.

1. What data are available?

Since 1954, the question on the number of children born has been moved from the census to the Family surveys associated with the census (Table 1) that only cover a sample of the population.⁽⁴⁾ The first family survey was conducted simultaneously with the census of 1954, and subsequent surveys were conducted with the censuses of 1962, 1975, 1982, 1990, 1999 and 2011 (Table 1). In the first three surveys, the question was only asked of ever-married women.⁽⁵⁾ In subsequent ones, it was asked of all women, irrespective of their marital status, and in the last two surveys it was also asked of men.

Table 1. Characteristics of the Family surveys

Survey year	Cohorts	Coverage	Sample size	
			Women	Men
1954	1899-1908	Married, widowed and divorced women	52,474	Not surveyed
1962		Not distributed		
1975	1910-1960	Married, widowed and divorced women	247,000	Not surveyed
1982	1917-1963	Women aged 18-64	310,000	Not surveyed
1990	1921-1971	Women aged 18-64	340,000	Not surveyed
1999	Up to 1981	Everyone	278,000	167,000
2011	Up to 1993	Everyone	238,000	121,000

Fertility estimates based on retrospective questions can be skewed by various biases due to recall errors (especially for the oldest women at the time of the survey), selection effects due to deaths of children and their mother or to migration of mothers, and non-response. Analyses of French and Belgian data show that the risks of bias stemming from recall errors and selection effects are very low (Brée et al., 2016b), which confirms Neels’ (2010) and Van Bavel’s (2014) findings for Belgium, and those of Andersson and Sobolev (2013) for Sweden. Women’s completed fertility calculated from censuses and surveys is consistent with completed fertility from civil registration data. Moreover, concordant results are obtained for the fertility of women from the same cohort observed across different censuses or surveys. Survey data nevertheless appear

(4) The sample size per cohort for the different surveys is presented in Appendix Figure A.1.

(5) The 1962 survey, considered to be biased, is no longer distributed by INSEE.

to be less reliable than data from exhaustive censuses, especially for analyses at regional level, where the numbers may be quite small (Brée et al., 2016b).⁽⁶⁾

The problem of non-response bias was raised by Paul Vincent as early as 1946. He identified two types of non-respondents to the question “How many live-born children have you had?”, namely “careless” respondents, who simply forgot to answer the question (or who did not wish to, although he does not really consider that possibility), and respondents who thought that, by leaving the space blank, they were indicating “none”. After analysing the non-responses, Vincent decided that the careless group accounted for only 3% of the total (in 1931) and assumed that the remaining 97% were childless. He distributed the first 3% of non-responses proportionately across the other family sizes. Louis Henry questioned this distribution method (Henry, 1953), but conceded that while the solution of considering all non-responders as childless was not quite satisfactory, it was doubtless impossible to do better. The researchers in charge of family statistics derived from the 1946 census also considered that all the women who did not answer the question “How many live-born children have you had?” were childless. While that may seem like a strong assumption, the differences between the 1931 and 1946 censuses are small (Figure 2). The level of total childlessness (all women) measured in this way (26% in France) is consistent with that measured in other western countries: 32% for Belgium (Brée et al., 2017), 26% in Germany (Dorbritz and Schwartz, 1996), 23% in the Netherlands (Rowland, 2007), 24% in the United States (Morgan, 1991) and 31% in Australia (Rowland, 2007).

In the Family surveys, although the non-response rates vary considerably from one survey to another⁽⁷⁾ (Brée et al., 2016b), consistent estimates are obtained for the different parities and for completed fertility by birth cohort.

2. Measuring completed fertility and family size by women’s marital status

Figure 1 shows estimates of completed fertility of women ever-married by age 45 calculated from the censuses of 1931 and 1946 on the one hand, and from the surveys of 1954, 1975, 1982, 1990, 1999 and 2011 on the other.⁽⁸⁾

The estimates based on the two types of data source are highly consistent, with the exception of the last family survey (Famille et logements, 2011), which leads to much lower completed fertility than the three previous surveys (particularly 1999). There seems to have been an under-reporting of children

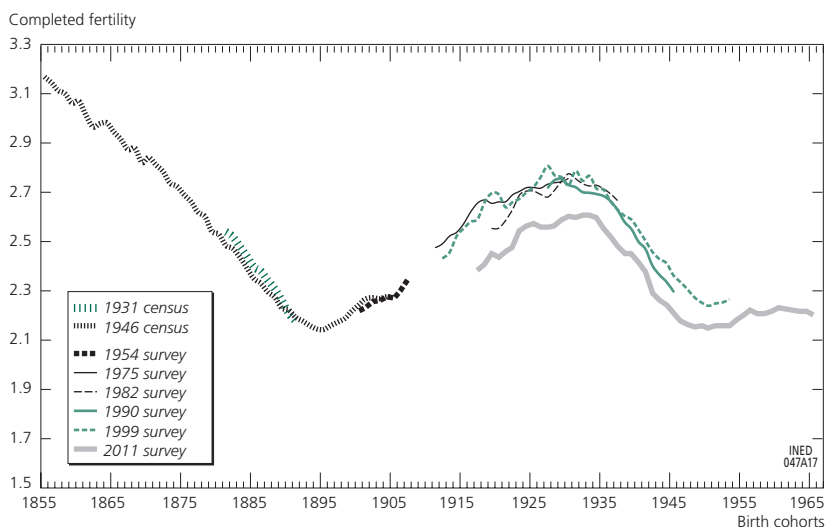
(6) It was Louis Henry who recommended remaining “at the national level” [with no more than] a broad classification into major occupational or [...] socioeconomic groups” (Henry, 1953, p. 490).

(7) The Family survey was compulsory until 1990. In 1999, given the largely retrospective nature of the survey, its designers dropped this requirement (Héran, 2005). This change probably explains the significant difference between the non-response rates in the 1982 and 1990 surveys and the more recent 1999 and 2011 surveys.

(8) For the 1999 and 2011 surveys, the weightings proposed by the survey designers were used (poids_{m5} for the 1999 survey and poids__{ind} for the 2011 survey).

born before the current union, in particular when those children were not living with the couple (Mazuy and Toulemon, 2013).

Figure 1. Completed fertility of ever-married women by cohort according to different sources (survey data smoothed over three years)



Interpretation: Average number of live-born children born per married, widowed or divorced woman in each cohort.

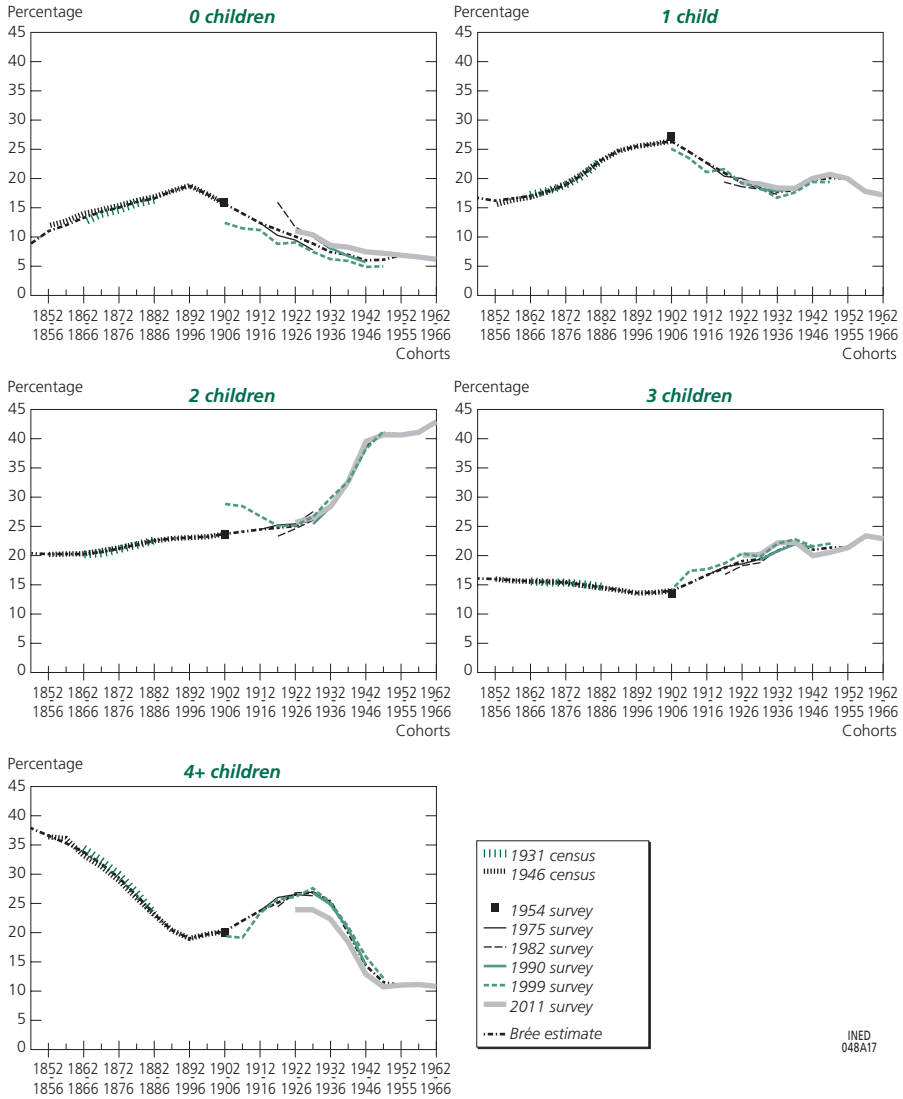
Sources: INSEE, population censuses, 1931, 1946; INSEE, ADISP-CMH, Enquête Famille, 1954, 1975, 1982, 1990; INSEE, ADISP-CMH, Étude de l'histoire familiale, 1999; INSEE, ADISP-CMH, Famille et logements, 2011.

But what if we look more specifically at the parity distribution (Figure 2)? With regard to childlessness among women who had been married at least once, the 1946 census is highly consistent with the data from the 1954 and 1975 surveys, and with the 1999 survey for the cohorts born after 1926. Compared with those data, the 1982, 1990 and 2011 surveys overestimate childlessness. The data from the different sources are concordant for the “one child” and “two children” categories (except the data from the 1999 survey for the cohorts of women born before 1920 who reported having had two children). The data are slightly less homogeneous for women who reported having had three children, although they are still fairly consistent. However, the 2011 survey underestimates the percentage of mothers of four or more children compared with the data from the other surveys.

Based on these different sources, we estimated women's fertility using the weightings shown in Table 2. The data from the censuses of 1931 and 1946 were used for the cohorts born before 1906. For the 1912-1916 cohort onwards,⁽⁹⁾ the family surveys were used, but not the 1999 and 2011 surveys for the oldest cohorts (aged over 75 at the time of those surveys) because the

(9) The average of 1902-1906 and 1912-1916 was used for the cohort of 1907-1911.

Figure 2. Distribution of ever-married women at the time of the survey or census by family size (%) and by five-year cohort according to different data sources (data smoothed over three years)



Interpretation: For each figure: proportion of ever-married women at the time of the survey who had x live-born children.

Sources: INSEE, population censuses, 1931, 1946; INSEE, ADISP-CMH, Enquête Famille, 1954, 1975, 1982, 1990; INSEE, ADISP-CMH, Étude de l'histoire familiale, 1999; INSEE, ADISP-CMH, Famille et logements, 2011.

numbers were very low (Appendix Figure A.1). We chose to use these simple estimates because they make it easier to distinguish between the fertility of ever-married women and never-married women while maintaining data consistency for all women. Moreover, these estimates can be updated with

Table 2. Weightings used for the estimates based on censuses (C) and family surveys (S)

Cohorts before 1850	C_{31}	1922-1926 cohorts	$(S_{75} + S_{82} + S_{99}) / 3$
1850-1886 cohorts	$(C_{31} + C_{46}) / 2$	1927-1931 cohorts	$(S_{75} + S_{82} + S_{90} + S_{99}) / 4$
1887-1906 cohorts	C_{46}	1932-1936 cohorts	$(S_{82} + S_{90} + S_{99}) / 3$
1907-1911 cohorts	average of surrounding cohorts	1937-1946 cohorts	$(S_{90} + S_{99} + S_{2011}) / 3$
1912-1916 cohorts	S_{75}	1947-1951 cohorts	$(S_{99} + S_{2011}) / 2$
1917-1921 cohorts	average of surrounding cohorts	1952-1966 cohorts	S_{2011}

Sources: INSEE, population censuses, 1931, 1946; INSEE, ADISP-CMH, Enquête Famille, 1954, 1975, 1982, 1990; INSEE, ADISP-CMH, Étude de l'histoire familiale, 1999; INSEE, ADISP-CMH, Famille et logements, 2011.

data from future family surveys. Estimates of parity distribution and completed fertility are shown in Appendix Table A.1.

Regarding women never married at age 45, the 1982, 1990, 1999 and 2011 surveys yield consistent results on parities and completed fertility despite the small numbers (Appendix Figure A.2). For the cohorts born before 1915, the fertility of never-married women could not be measured directly. To estimate general fertility from the 1946 census (which does not provide data on never-married women), Festy calculated that never-married women contributed to general fertility by 0.06 first births and 0.02 second births, i.e. a total of 0.08 births for completed fertility of 2 to 2.6 births for all women (Festy 1979; INED, 1966, 1991). This is equivalent to 3% to 4% of births outside wedlock, a calculation consistent with Nizard and Maksud's (1977) data on illegitimate births. However, this means, for the 1891-1895 cohort for example, that 52% of women who were never married at age 45 were childless, that 32% had one child and 16% had two children. The idea that almost half of the women who were never-married at age 45 had at least one child seems excessive, especially given that, among women born in 1912-1916 (the first cohorts for which parities of never-married women are at levels consistent with those of subsequent cohorts), the 1999 survey found that 84% of never-married women were childless, 10% were mothers of one child and 6% mothers of two children, i.e. just 16% of never-married women had at least one child. We therefore decided to apply these percentages for the earlier cohorts, at the risk of under-estimating slightly the contribution of never-married women to general fertility if illegitimate births decreased over those cohorts.⁽¹⁰⁾ These estimates of the fertility of women never-married at age 45 are therefore lower than Festy's, as is also the case, therefore, for my estimates of general fertility.

(10) Illegitimate births were slightly more frequent in the cohorts born between 1860 and 1890 (roughly 9% according to Nizard and Maksud, 1977) than in the later cohorts (7% for the cohorts born around 1900; 8% for those born in the 1920s; source: INSEE, civil registration).

The parity distribution of all women and their completed fertility is estimated using the following formula:

$$PX_g = PX_m * (1 - C_p) + PX_{nm} * C_p$$

where PX_g = overall fertility at birth-order x

PX_m = fertility at birth-order x of women ever-married at age 45

PX_{nm} = fertility at birth-order x of women never-married at age 45

C_p = Permanent celibacy⁽¹¹⁾

The estimates for the cohorts born from the 1920s onwards⁽¹²⁾ are highly consistent with those based directly on the survey data (Appendix Figure A.3). The estimates for the previous cohorts differ from those derived from the 1946 census since the data available in that census for all women assumed that all never-married women were childless (Appendix Figure A.4). They also differ from those that can be derived from the data in Depoid (1941) or Festy (1979) based on a diagonal reading⁽¹³⁾ of age-specific fertility rates (Appendix Figure A.4). These estimates, for the cohorts born before 1890, are higher than those based an assumption that all never-married women had at least one child, which is clearly improbable: either completed fertility calculated retrospectively underestimates fertility, or a diagonal reading of age-specific fertility overestimates it.

Under the first hypothesis, it would mean that the women who died or migrated had higher fertility than the others. Yet, the women lost to observation generally had slightly lower fertility than the survivors (Andersson and Sobolev, 2013; Brée et al., 2016b). As suggested above, assuming that all of the women who did not respond were childless may also be excessive. It is also possible that when they answered the question at age 45 or more, some women may have omitted children who were born alive but who died a few hours or a few days after birth.⁽¹⁴⁾

Under the second hypothesis, completed fertility could be overestimated by a diagonal reading “because the fragments of the history of the various cohorts represented by each of these rates in a given year depend on the past history of these same cohorts” (Sardon, 1990, p. 17).

The fertility of never-married women and of all women born before 1890 probably falls somewhere between Festy’s estimates (probably overestimated) and ours (probably underestimated). This analysis of the sources and the various estimates derived from those sources suggests that the family size estimates for married women are the most robust, in particular for the oldest cohorts.

(11) We chose to use the levels of permanent celibacy from the population censuses (INSEE) rather than from the surveys (which, according to Toulemon, 1996, are underestimated). For the cohorts from 1850 to 1922-1926, the level used is that published in Chasteland and Pressat (1962).

(12) The cohort fertility of all women cannot be estimated from the 1931 and 1946 censuses because only married, widowed or divorced women were surveyed, which explains why this method was chosen.

(13) The method consists in summing the age-specific rates for the same cohort (e.g. for the cohort born in 1930, the fertility rate at age 20 in 1950 is added to the fertility rate at age 21 in 1951, and so forth).

(14) The issue of how stillborn children are counted is irrelevant here because the question is only asked in relation to live-born children.

II. Changing family size in cohorts born between 1850 and 1966

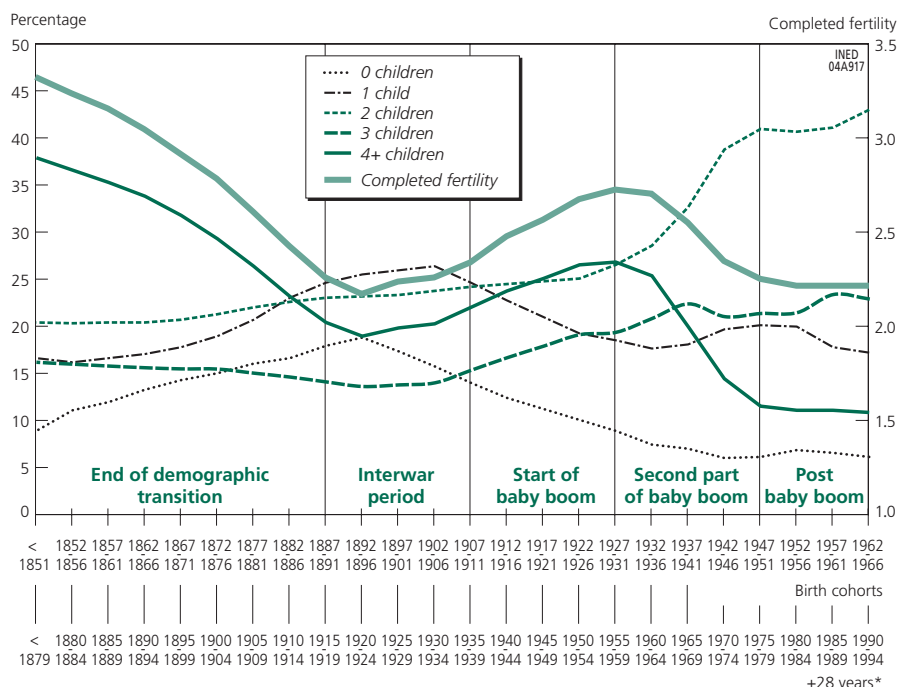
1. Trends in family size

Ever-married women

Figure 3 shows the trend in family size and completed fertility of ever-married women in the cohorts born in France between 1850 and 1966. We can see that similar fertility levels are not always the result of the same parity components (Toulemon, 2001). The 1897-1901 and 1957-1961 cohorts exhibit the same low completed fertility (2.22 children per woman), but for the earlier cohorts it can be attributed mainly to high percentages of childless women (17%) and mothers of only one child (26%), whereas for the later cohorts it results from a predominance of two-children families (41%).⁽¹⁵⁾

Five groups of cohorts emerge from Figure 3. First, the cohorts born before 1890, for whom the dominant model (more than 25%) was large families of four or more children, and whose share began falling steadily at the end of the

Figure 3. Parity distribution of ever-married women (at age 45) by cohort



* The mean age at childbirth was 28 years for the oldest cohorts, and 27 for the more recent cohorts (INSEE, population estimates and civil records). For ease of interpretation, an average age of 28 years was added to the birth cohorts to give an idea of the reproductive period.

Source: Appendix Table A.1.

(15) In both cohorts, one-third of women were mothers of three or more children.

nineteenth century (De Luca-Barrusse, 2008); second, the cohorts born between 1891 and 1911 who had their children between the two World Wars and for whom the dominant model was one child; third, the cohorts born between 1912 and 1931 who had most of their children during the baby boom, among whom we see an increase in the number of families of three or more children; fourth, the 1932-1946 cohorts among whom the share of families of four or more children declined and the two-children family began to dominate (more than 30% of families); last, the cohorts born in and after 1947, among whom we observe a general convergence of fertility behaviours (Daguet, 2002; Prioux, 2002) and a stability (Toulemon et al., 2008), which seems to persist to this day (Mazuy et al., 2013).

We thus observe a “cyclical” pattern, where each cohort seems to react to the previous one by adopting the opposite behaviour. The daughters of the women who had large families (the cohorts born before 1890) themselves had fewer children (the cohorts of 1891-1911); in turn, their daughters had large families (1912-1931 cohorts), but their granddaughters returned to lower fertility (1932-1951 cohorts). However, the most recent cohorts (1952-1966) seem to have maintained a steady model of fertility mainly characterized by a majority of two-children families, although it is too early to say whether this is a long-term trend or not.

The fertility decline at the end of the nineteenth century has been interpreted as a sign of the change in parent-child relationships when affection became central (Ariès, 1960, 1980) and the child became “precious” (Praz, 2005). Controlling fertility enabled parents to invest, emotionally and financially, in the “quality” of their children (Alter, 1992; Becker, 1965; Caldwell, 1976). An analysis of family sizes reveals that it is mainly large families (four or more children) that have become less and less common: their share fell by more than half between the cohorts of 1850 and 1895. Anne-Marie Sohn (1996, p. 809) has called the fourth child a “threshold number”, beyond which “parents decide to abort”. However, the decrease in families of four or more children was not offset by an increase in three-children families but rather by an increase in the percentages of childless women and mothers of only one child among the women who had children in the inter-war period. In other words, the fertility decline that began with the cohorts born around 1850 has not been linear across all family sizes, with a progressive downsizing from four children to three, and from three children to two, and so forth, but represents a shift from a regime where more than one-third of families had four or more children to a regime where large families accounted for fewer than one-fifth of the total.

The interwar period was highly specific because it simultaneously represented the end of the first transition (or the beginning of the stabilization phase if we view the post-war baby boom as simply an “accident”; Desplanques, 1988; Knibiehler, 1997) and a time of major socioeconomic change (the demographic, social and economic impact of the First World War and the

economic crisis of the 1930s).⁽¹⁶⁾ Despite public policies to boost fertility through repressive measures⁽¹⁷⁾ and incentives⁽¹⁸⁾ aimed at rebuilding the population and making up for the deficit in births, the women who had their children between 1920 and 1940 were among the least fertile of the twentieth century. There was clearly a mismatch between legislative action and behaviour (Cova, 1997), since these laws had no apparent impact on the birth rate (McLaren, 1990). While the first child was usually desired, subsequent births were often precluded: “maternal instinct” was often referred to in the joyful testimonies recorded by Rebreyend (2003, p. 214), but much less so for successive, closely-spaced pregnancies, with unwanted pregnancies being described as a trap. One-child families seem to have been truly characteristic of the interwar period (Brée et al., 2016a, 2017). Some researchers attribute the high prevalence of small families to the specific events of the period rather than to personal preference (Rowland, 2007). For others, the rise in childlessness and in the proportion of one-child families indicates a growing acceptance of behaviours (especially being married and voluntarily childless) that had been unthinkable earlier (Anderson, 1998; Morgan, 1991). These behaviours are sometimes described as pioneering precursors of future change (Anderson, 1998; Van Bavel and Kok, 2010). It is hard to fully comprehend the reasons behind the low fertility levels of the interwar period, although, in addition to the continued fertility decline linked to the end of the transition, most theories emphasize the aggravating effect of context (Brée et al., 2016a).

How should we interpret the fertility upturn that began with the 1895 cohort (Festy, 1979)? The French baby boom was characterized by a decline in childlessness and one-child families, a slight increase in two-children families, but above all by a very sharp increase in the share of families of three or more children. If we simulate a linear decline in families of four or more children between the cohorts of 1897 and 1937, instead of the observed increase, and proportionally redistribute the other family sizes, completed fertility levels off in accordance with the theoretical model of the demographic transition (Appendix Figure A.5). This result supports the interpretation of the baby boom as a temporary deviation (Coleman, 2004) and establishes the interwar period as the end of the demographic transition, or at least as the beginning of a long phase of stagnation of average fertility, because family sizes subsequently changed again. Demographers continue to argue about the factors that led the cohorts of only children to have so many large families (Calot and Sardon, 1998; Van Bavel and Reher, 2013). The baby boom has been seen as a consequence of the optimism triggered by the end of the Second World War. However, fertility began to rise before the end of the war, so that hypothesis has been

(16) On the links between fertility and crises, see Eggerickx et al. (2016).

(17) Acts of 1920 prohibiting the advertisement and sale of contraceptive methods, and the Act of 1923 that downgraded abortion from a crime to a misdemeanour, with a lighter penalty.

(18) Mother's Day and family allowance in 1932 (the latter was made universal in 1939).

rejected (Calot and Sardon, 1998; Van Bavel and Reher, 2013). Economic explanations have also often been advanced but do not find much empirical support (outside studies of the United States; Doliger, 2008). According to Van Bavel and Reher (2013), the baby boom can be attributed largely to a boom in marriage, a decrease in the mean age at marriage and a consequent decrease in the mean age at first birth. Longer marriages and the use of still traditional means of contraception (mainly coitus interruptus) led to an increase in family sizes. In the specific case of France, according to Calot and Sardon (1998) and to Chesnais (2006), France's pro-family policies may also have created a "sense of urgency" to avoid population decline.

In the cohorts born in the early 1930s, fertility fell again. In France the baby bust was characterized by an increase in families of two children and a decline in families of four or more. The bust is usually attributed to the contraceptive revolution (Westoff and Ryder, 1977), even though it predated by a few years the distribution and use of the contraceptive pill (but not necessarily its appearance; Caldwell, 2001). According to Leridon (1987), the baby bust was the combined result of a decrease in the desired number of children and more effective family planning. Van de Kaa and Lesthaghe (Lesthaghe, 1995; Lesthaghe and Van de Kaa, 1986; Van de Kaa, 1987) have proposed the concept of "second demographic transition" to describe the changes in the last third of the twentieth century that led to the decline in fertility. According to these authors, the emergence of an individualistic family model, in which the family is built upon the couple relationship, has affected both the family formation process (delayed marriage and greater propensity to divorce) and reproductive behaviour, with a pronounced decline in fertility. Coleman (2004), along with others, has contested this theory, claiming that the fertility downturn is simply a phase in the overall process of fertility transition that began at the turn of the twentieth century or even earlier.

In the most recent cohorts (women born in and after the 1950s), fertility reached very low levels, characterized by strong polarization around two-children families and a smaller percentage of large families with four or more children. However, even if the very low levels of fertility observed since the late 1970s and especially in the 1980s are one of the characteristic features of the "second demographic transition", current fertility levels are not exceptional and are similar to those observed before the baby boom (Brée et al., 2017). The predominance of two-children families is, conversely, specific to the women born since the 1940s. However, Frejka (2008) suggests that this predominance may be challenged by a possible future increase in childless and one-child families. In France, childlessness remains at fairly low levels compared with other European countries, but one-child families are quite common and their percentage has remained relatively stable since the cohorts born in the 1940s. This stability is remarkable given that the expected impact of the increase in the mother's age at first birth and the higher frequency of separation among

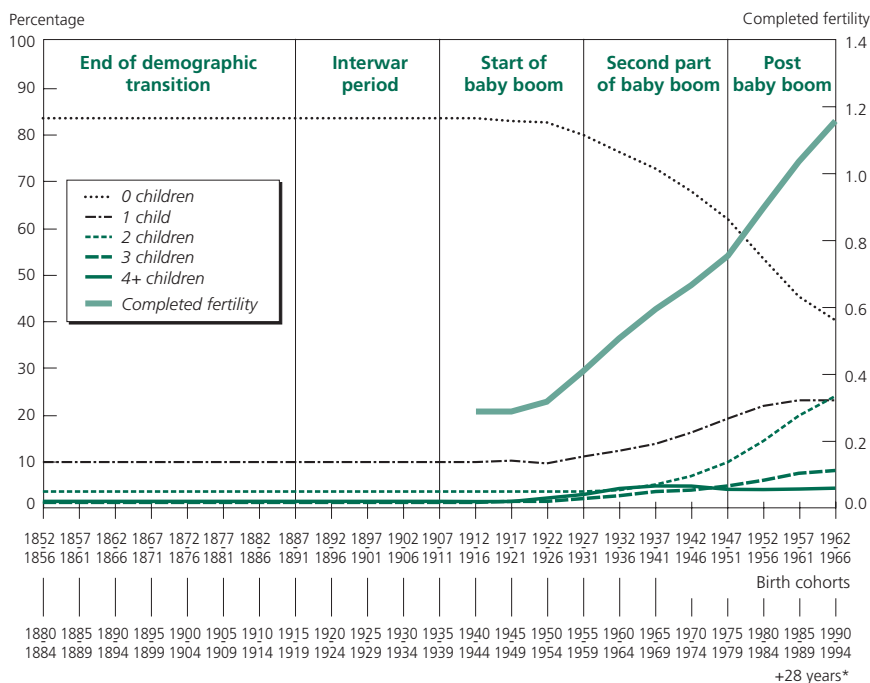
couples with one child would be to raise the probability of having only one child (Breton and Prioux, 2009).

Never-married women

While there are relatively few never-married women in the cohorts studied (7-12%), their fertility behaviour warrants analysis, especially as their proportion has increased in the most recent cohorts, and hence the share of their births in overall fertility.⁽¹⁹⁾

While the women born before the First World War had very few children out of wedlock – illegitimacy was still socially stigmatized (Fauve-Chamoux and Brunet, 2014) – behaviours changed after the Second World War. A growing proportion of never-married women born in the late 1920s and early 1930s had at least one child (Figure 4), and the phenomenon amplified in the subsequent

Figure 4. Parity distribution of never-married women at age 45, by cohort



* The mean age at childbirth was 28 years for the oldest cohorts, and 27 years for the more recent ones (INSEE, population estimates and civil records). For ease of interpretation, an average age of 28 was added to the birth cohorts to give an idea of the reproductive period.

Note: For the oldest cohorts (up to the 1912-1916 cohort), the distribution is the same because we applied the distribution of the 1912-1916 cohort to them. Even if the shift in the distribution between the 1855 and 1910 cohorts is probably not as constant, the limited change observed between the 1912-1916 and 1922-1926 cohorts seems to validate our methodological choice.

Source: Appendix table A.1.

(19) On the contribution of illegitimate fertility to overall fertility in the nineteenth century, see Brée (2014).

cohorts. While explanations for the baby boom often revolve around the increase in legitimate fertility and age at marriage (Van Bavel and Reher, 2013), it appears that never-married women also contributed to the increase in fertility, at least in France.

Starting in the 1970s, with the increase in cohabitation before marriage (Roussel, 1978) and non-marital unions (Guibert-Lantoine et al., 1994; Rault and Régnier-Loilier, 2015) marriage was no longer a pre-requisite for family formation. Extra-marital births became more common (Muñoz-Perez and Prioux, 1999) even if childbearing was generally preceded by marriage. By 2007, however, the percentage of children born outside marriage exceeded that of children born to married couples (INSEE, civil records). Among never-married women, a large number have nevertheless been in a relationship, have lived with a partner and even officialized their union (through a civil partnership, introduced in 1999; Rault and Régnier-Loilier, 2015), but never-married women have always had fewer children than their ever-married counterparts. In the cohorts born in 1962-1966, a much higher percentage of never-married women are childless than ever-married women (40% versus 6%). However, among women who have had at least one child, the behaviours are much more similar. Never-married mothers more frequently have only one child than ever-married mothers (39% versus 19%), but they almost as often have two children (40% versus 44%).

These differences in fertility can be attributed to the fact that some never-married women do not have a partner, or at least not during their reproductive years, but also to the fact that women who do not want children are much less likely to marry than those who do.

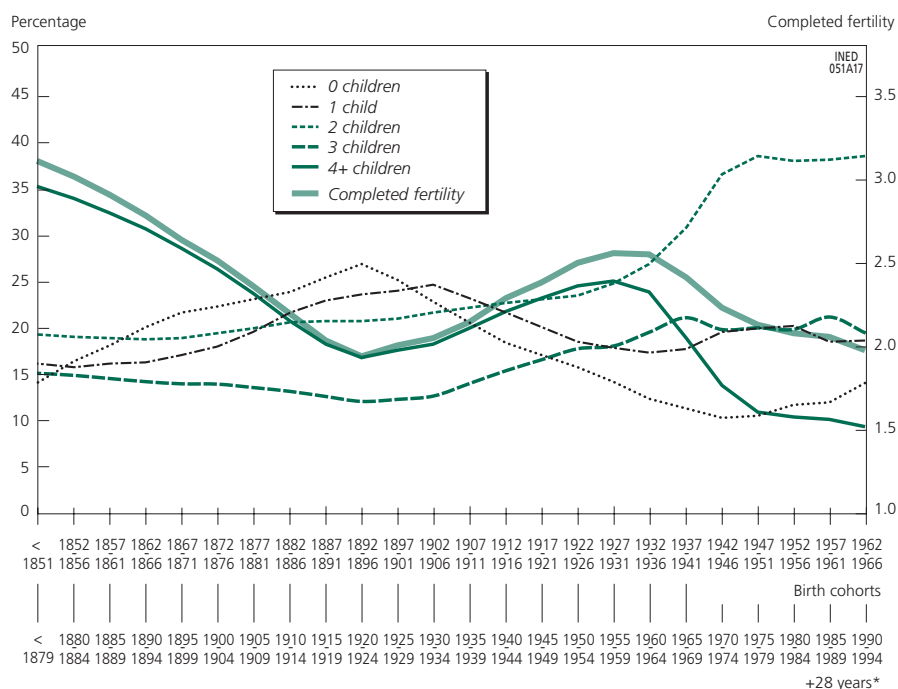
All women

The family sizes of all women (Figure 5) closely match those of ever-married women, since the latter represent the overwhelming majority (88% to 93%) of women. The main variations are observed for parities 0 and 1, since these are the parities most affected by the behaviour of never-married women. The changes in completed fertility appear to be determined by large families, even more so than for married women alone.

Childlessness should therefore always be analysed with care, since levels vary strongly depending on whether all women or only ever-married women are taken into account. In France, childlessness among women born in 1892-1896 was 26.9% for all women and 18.8% for ever-married women.

Analysing the fertility of ever-married women only might appear to be a more rigorous approach (because the data are better and the indicator more robust since ever-married women are, in principle, all exposed to the risk of pregnancy). For the most recent cohorts, however, it is important to measure overall fertility, since there is no longer a distinction between marital and non-marital births.

Figure 5. Parity distribution of all women, by cohort (1850-1966)



* The mean age at childbirth was 28 years for the oldest cohorts, and 27 years for the more recent ones (INSEE, population estimates and civil records). For ease of interpretation, an average age of 28 was added to the birth cohorts to give an idea of the reproductive period.

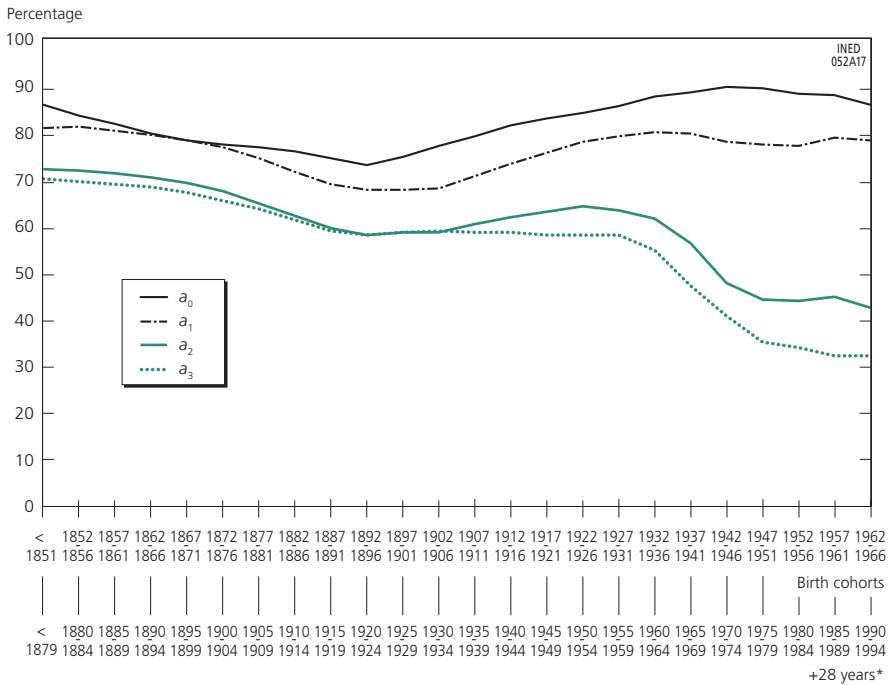
Sources: Appendix table A.1.

2. Parity progression ratios

In addition to family size, which indicates how many women have had exactly one child, two children, and so forth, during their lifetimes, parity progression ratios measure the percentage of women who have increased their family size from one child to two, from two to three and so on (Figure 6). For all childless women, the ratio a_0 expresses the risk of having at least one birth (its complement to 1 ($1 - a_0$) represents the risk of remaining childless). For all women who have had at least one child, the probability a_1 expresses the risk of having at least two children, and so forth. This indicator is useful in that it shows how many women are mothers of at least one child, at least two children, etc., without taking subsequent births into account. It is surprising to observe that while the probability of having a second child is the same in the cohorts born around 1960 as in those born a century earlier, there are twice as many families of two children in the most recent cohorts (39%) as in the cohorts born around 1860 (18%).

We can see immediately that parity progression ratios decreased across all cohorts of women born between 1850 and 1891. The pattern changed for

Figure 6. Parity progression ratios of all women born between 1850 and 1966



* The mean age at childbirth was 28 years for the oldest cohorts, and 27 years for the more recent ones (INSEE, population estimates and civil records). For ease of interpretation, an average age of 28 was added to the birth cohorts to give an idea of the reproductive period.

Legend: In the 1892-1896 birth cohorts, the probability of having a first child was 73% (a_0), that of having a second child 68% (a_1) and so forth.

Note: The parity progression ratios for the cohorts born after 1962 are for reference only.

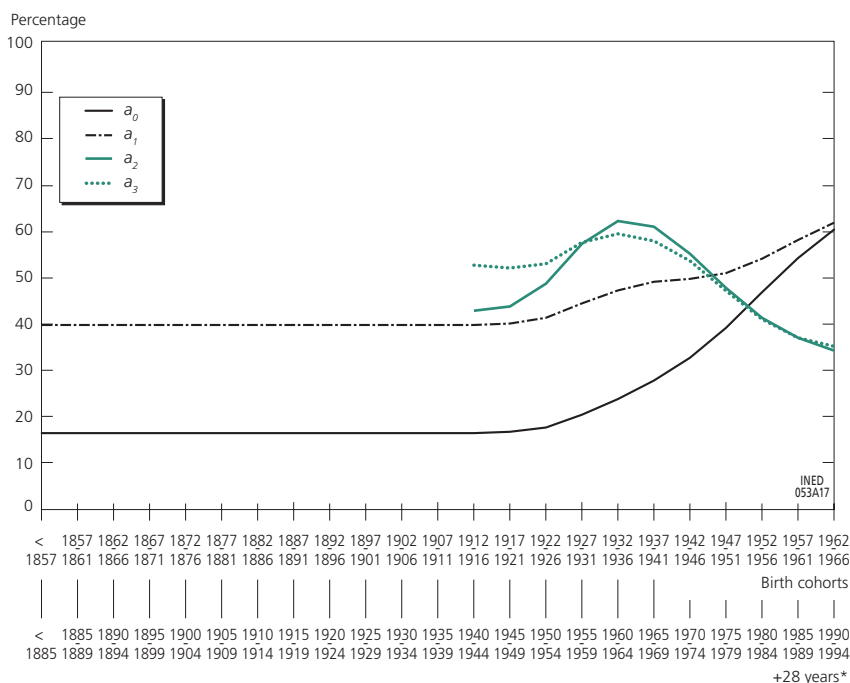
Source: Enquête Famille et logements (2011).

the cohorts between 1892 and 1911 who had their children during the interwar period, among whom the probability of having a first child increased. The probability of having a second child began to increase with the 1902-1906 cohort and that of having a third child with the following cohort. Starting with the cohorts born in 1927-1931, the probability of having a first child and then a second was higher than in the cohorts born in the mid-nineteenth century. Conversely, the probabilities of higher parities fell, indicating a shift in fertility behaviour which subsequently became increasingly dependent on the number of children already born, as is characteristically the case under regimes of more controlled fertility (Festy, 1979). Lastly, starting with the women born in the 1950s, who began having children in the early 1980s, behaviours have tended to stabilize: 87% of these women have at least one child, and they had the highest probability of having a second child (78%). By contrast, very few have more than two children: the probabilities of having a third child ($a_2 = 44\%$) or more than three ($a_3 = 33\%$) has dropped sharply. The stabilization of the parity progression ratios a_2 and a_3 in the cohorts

born after the Second World War may indicate a polarization effect, with some women still having large families. Large families are less common than in the previous cohorts but probably reflect a choice not to limit family size. This may be a consequence of international immigration and the permanent settlement in France of communities with higher fertility than the French average (Masson, 2013).

Although the preceding comments are also valid for ever-married women (Appendix Figure A.6), the parity progression ratios of never-married women follow quite a different pattern (Figure 7). Firstly, the probability of having a (first) child increased from 17% to 60% between the never-married women born in the early 1920s and those born in the late 1960s. Even more importantly, the probability of having a second child increased steadily between those cohorts, to the extent that never-married women born in the 1960s and mothers of one child have almost all had a second child. However, only 35% have a third child and, of that group, only the same percentage have a fourth child. While never-married women are still much less likely to have a first and a second child than ever-married women, their behaviours are nevertheless moving closer to those of ever-married women, in particular for those who

Figure 7. Parity progression ratios of never-married women born between 1850 and 1966



* The mean age at childbirth was 28 years for the oldest cohorts, and 27 years for the more recent ones (INSEE, population estimates and civil records). For ease of interpretation, an average age of 28 was added to the birth cohorts to give an idea of the reproductive period.

Source: Enquête Famille et logements (2011).

already have two children. Never-married women who already have three children are just as likely to have a fourth child as ever-married mothers of three children.

Conclusion

Despite the difficulties stemming from the diversity of available sources and the heterogeneity of results, it is nonetheless possible to assess trends in the lifetime parity distribution of women born between 1850 and 1966. This historical analysis of parities and parity progress ratios refines the conclusions drawn from averages (completed fertility) and shows that parity distributions should always be taken into account when analysing fertility (Anderson, 1998). It provides a clear picture of the considerable decline in large families (four or more children) among the cohorts born between 1850 and 1900, the high prevalence of childlessness and one-child families in the cohorts who had their children in the interwar period, and the sharp increase in families of two children starting with the cohorts born in the 1920s. Consideration of family size is therefore important for fertility analysis because it shows that for the same completed fertility, the parity distribution may vary substantially, revealing different conceptions of family. It has particular value for the historical analysis of the family and of the place of children and women in society. Longitudinal research is also essential for understanding recent fertility trends and putting them into perspective. Indeed, while current fertility levels are low, they are not exceptional on the scale of a century of cohort fertility, and the fertility of the most recent cohorts is characterized less by low fertility than by the high prevalence of two-children families.

Lastly, this research highlights the importance of distinguishing between the fertility of all women, of ever-married women and of never-married women, particularly for the analysis of childlessness and low fertility (one child). This differentiation confirms the overwhelming impact of the fertility of ever-married women until the cohorts born in the 1920s and the subsequent impact on fertility of new union formation preferences.

The renewal of interest in fertility in the twentieth century⁽²⁰⁾ reflects the continuing quest to understand the end of the demographic transition (Brée et al., 2016a, 2016c; Breschi et al., 2016), the baby boom (Duvoisin et al., 2016; Gauvreau and Laplante, 2016) and the baby bust (Nomès and Van Bavel, 2016). Retrospective analysis of family sizes by educational level or religion, or in relation to marriage patterns, offers new elements for understanding changes in fertility. Likewise, analysis at the sub-national level makes it possible to explore the heterogeneity of behaviours in more detail, as recommended by Van Bavel and Reher (2013). The contribution of

(20) See, for example, issue 2016-2 of *Les Annales de démographie historique*.

qualitative approaches (Bonvalet et al., 2011; Rebreyend, 2003; Rusterholz, 2015, 2017; Sohn, 1996) is also increasing. Clearly, a combination of these methods is needed in order to understand fertility in the twentieth century and up to the present day.



APPENDICES

Table A.1. Parity distribution (%) and completed fertility

Cohorts	0 children	1 child	2 children	3 children	4+ children	Completed fertility
<i>All women</i>						
Before 1857	19.1	15.5	18.5	14.3	32.7	2.91
1857-1861	20.1	15.9	18.5	14.1	31.5	2.83
1862-1866	21.1	16.2	18.5	14.0	30.2	2.75
1867-1871	22.2	16.9	18.7	13.8	28.3	2.62
1872-1876	22.7	17.9	19.3	13.8	26.2	2.51
1877-1881	23.1	19.6	20.0	13.6	23.8	2.37
1882-1886	23.9	21.6	20.6	13.1	20.8	2.20
1887-1891	25.5	23.0	20.7	12.6	18.2	2.03
1892-1896	26.9	23.6	20.7	12.0	16.8	1.94
1897-1901	25.2	24.0	21.0	12.3	17.6	2.00
1902-1906	22.8	24.7	21.6	12.6	18.2	2.05
1907-1911	20.6	23.2	22.2	14.0	20.0	2.15
1912-1916	18.4	21.7	22.8	15.4	21.8	2.29
1917-1921	17.0	20.1	23.1	16.6	23.2	2.39
1922-1926	15.7	18.5	23.4	17.7	24.6	2.50
1927-1931	14.2	17.9	24.8	18.0	25.1	2.56
1932-1936	12.3	17.3	26.9	19.6	23.9	2.55
1937-1941	11.3	17.8	30.9	21.1	19.0	2.42
1942-1946	10.3	19.5	36.6	19.8	13.8	2.24
1947-1951	10.6	20.0	38.6	20.0	10.9	2.13
1952-1956	11.6	20.2	38.0	19.8	10.3	2.08
1957-1961	11.9	18.5	38.3	21.2	10.1	2.06
1962-1966	14.1	18.6	38.6	19.4	9.3	1.97

Married, widowed and divorced women at the time of the survey or census

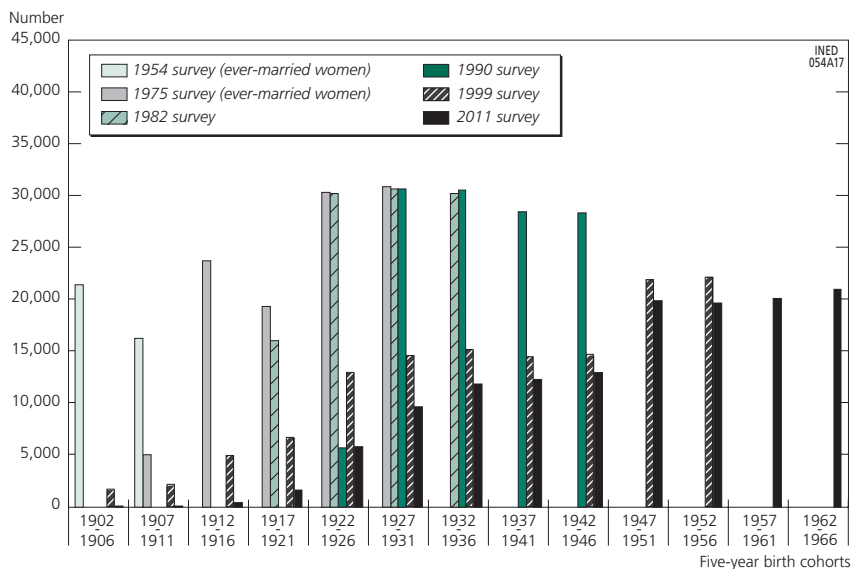
1850 and earlier	8.8	16.7	20.5	16.1	37.9	3.33
1851-1855	11.0	16.2	20.3	16.0	36.6	3.24
1857-1861	12.0	16.6	20.3	15.8	35.3	3.16
1862-1866	13.3	17.0	20.3	15.6	33.8	3.05
1867-1871	14.3	17.8	20.7	15.5	31.8	2.92
1872-1876	15.0	18.9	21.3	15.4	29.4	2.79
1877-1881	16.0	20.7	22.0	15.0	26.4	2.61
1882-1886	16.6	23.1	22.6	14.6	23.2	2.43
1887-1891	17.8	24.7	23.0	14.1	20.4	2.26
1892-1896	18.8	25.5	23.2	13.6	19.0	2.17
1897-1901	17.3	25.9	23.3	13.7	19.7	2.24
1902-1906	15.6	26.4	23.8	14.0	20.2	2.26
1907-1911	14.0	24.6	24.1	15.3	22.0	2.34
1912-1916	12.4	22.7	24.5	16.7	23.7	2.48
1917-1921	11.2	21.0	24.8	17.9	25.1	2.57
1922-1926	10.0	19.3	25.1	19.1	26.5	2.68
1927-1931	8.8	18.4	26.5	19.4	26.9	2.73
1932-1936	7.4	17.7	28.6	20.8	25.4	2.71
1937-1941	6.9	18.0	32.7	22.4	20.0	2.55
1942-1946	6.0	19.7	38.8	21.0	14.4	2.35
1947-1951	6.1	20.1	41.1	21.4	11.5	2.25
1952-1956	6.8	20.0	40.7	21.4	11.0	2.22
1957-1961	6.5	17.8	41.2	23.4	11.1	2.22
1962-1966	6.1	17.2	43.0	22.9	10.8	2.22

Table A.1. (cont'd) Parity distribution (%) and completed fertility

Cohorts	0 children	1 child	2 children	3 children	4+ children	Completed fertility
<i>Never-married women at the time of the survey</i>						
1850 and earlier	83.55	9.95	3.74	1.31	1.44	0.30
1857-1861	83.55	9.95	3.74	1.31	1.44	0.30
1862-1866	83.55	9.95	3.74	1.31	1.44	0.30
1867-1871	83.55	9.95	3.74	1.31	1.44	0.30
1872-1876	83.55	9.95	3.74	1.31	1.44	0.30
1877-1881	83.55	9.95	3.74	1.31	1.44	0.30
1882-1886	83.55	9.95	3.74	1.31	1.44	0.30
1887-1891	83.55	9.95	3.74	1.31	1.44	0.30
1892-1896	83.55	9.95	3.74	1.31	1.44	0.30
1897-1901	83.55	9.95	3.74	1.31	1.44	0.30
1902-1906	83.55	9.95	3.74	1.31	1.44	0.30
1907-1911	83.55	9.95	3.74	1.31	1.44	0.30
1912-1916	83.55	9.95	3.74	1.31	1.44	0.30
1917-1921	83.44	10.01	3.74	1.36	1.45	0.29
1922-1926	82.51	10.39	3.72	1.63	1.74	0.32
1927-1931	79.91	11.19	3.78	2.16	2.97	0.41
1932-1936	76.41	12.49	4.10	2.83	4.17	0.51
1937-1941	72.50	14.07	5.22	3.47	4.74	0.60
1942-1946	67.75	16.43	7.09	4.03	4.70	0.67
1947-1951	61.49	19.25	10.20	4.84	4.22	0.76
1952-1956	53.49	21.75	14.68	5.98	4.09	0.90
1957-1961	45.80	22.94	19.77	7.29	4.19	1.04
1962-1966	40.17	23.27	24.10	8.10	4.36	1.16

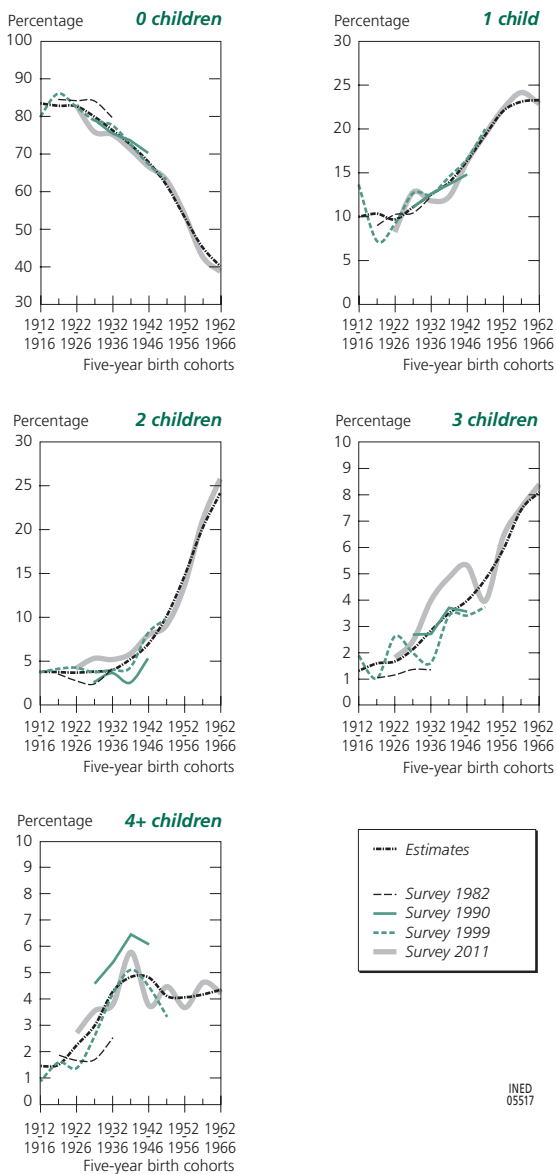
Source: Author's calculations based on: INSEE, population censuses, 1931, 1946; INSEE, ADISP-CMH, Enquête Famille, 1954, 1975, 1982, 1990; INSEE, ADISP-CMH, Étude de l'histoire familiale, 1999; INSEE, ADISP-CMH, Famille et logements, 2011.

Figure A.1. Distribution of the number of women aged 45 at most at the time of the survey, by five-year cohort



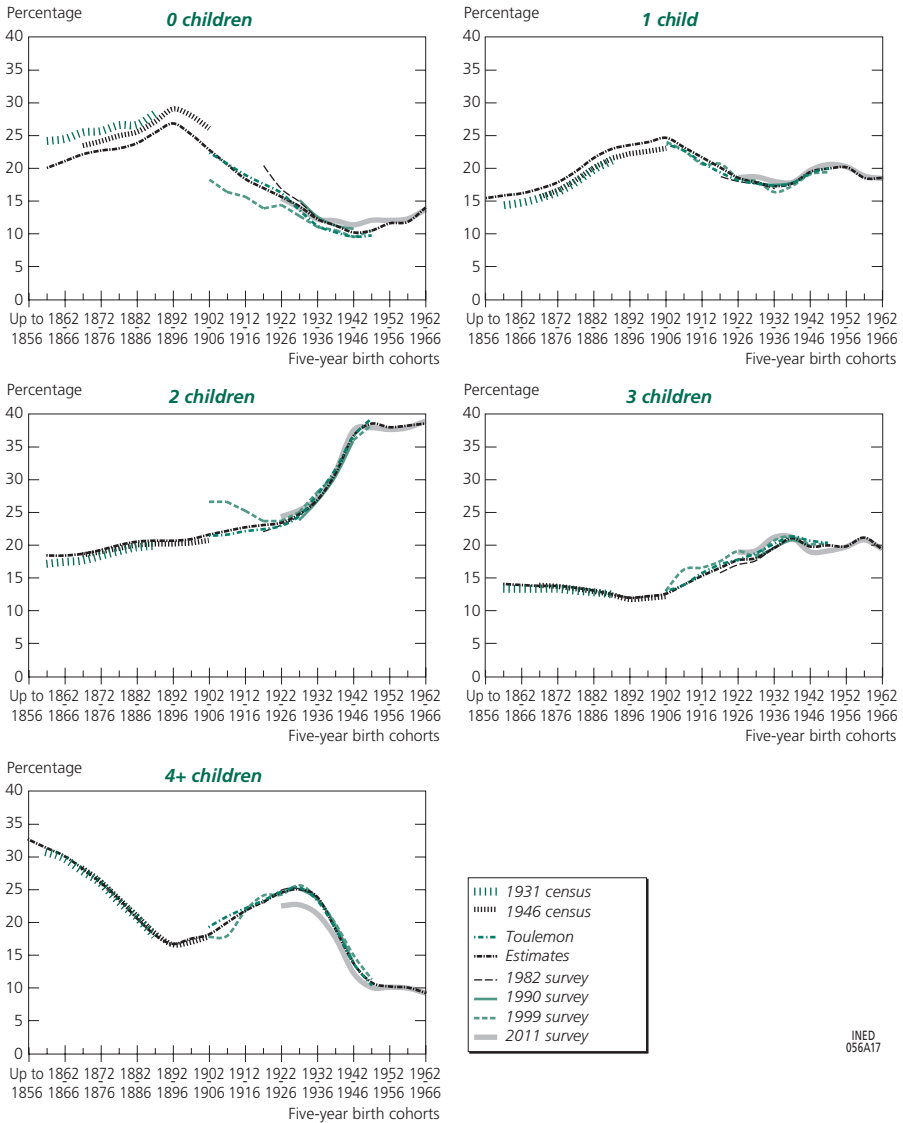
Sources: INSEE, ADISP-CMH, Enquête Famille, 1954, 1975, 1982, 1990; INSEE, ADISP-CMH, Étude de l'histoire familiale, 1999; INSEE, ADISP-CMH, Famille et logements, 2011.

Figure A.2. Parity distribution of never-married women (1912-1916 to 1962-1966 cohorts)



Source: Author's calculations based on: INSEE, population censuses, 1931, 1946; INSEE, ADISP-CMH, Enquête Famille, 1954, 1975, 1982, 1990; INSEE, ADISP-CMH, Étude de l'histoire familiale, 1999; INSEE, ADISP-CMH, Famille et logements, 2011.

Figure A.3. Parity distribution of all women

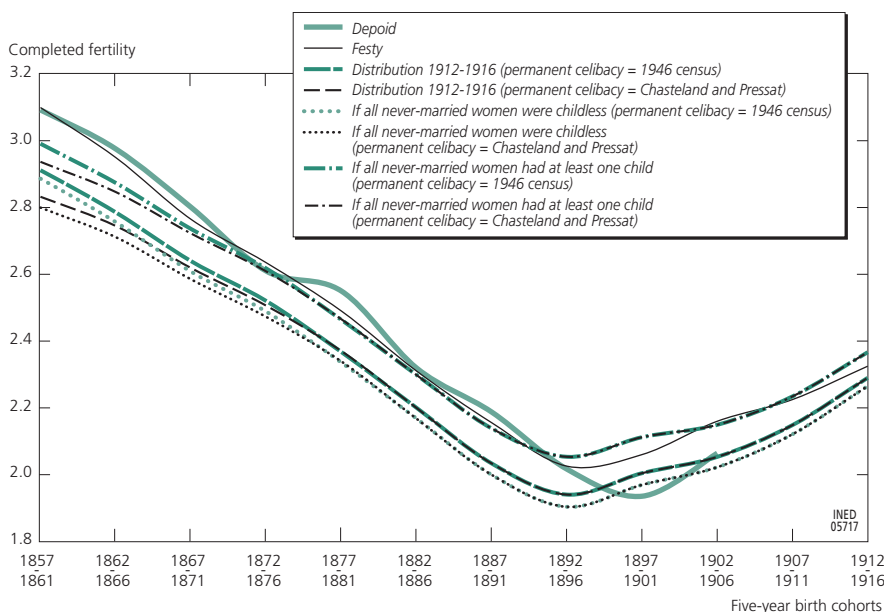


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Note: The results of the 1931 and 1946 censuses are provided for reference only because they were calculated on the assumption that all never-married women were childless (which explains the much bigger differences for 0 and 1 child than for the other parities).

Source: INSEE, population censuses, 1931, 1946; INSEE, ADISP-CMH, Enquête Famille, 1954, 1975, 1982, 1990; INSEE, ADISP-CMH, Étude de l'histoire familiale, 1999; INSEE, ADISP-CMH, Famille et logements, 2011.

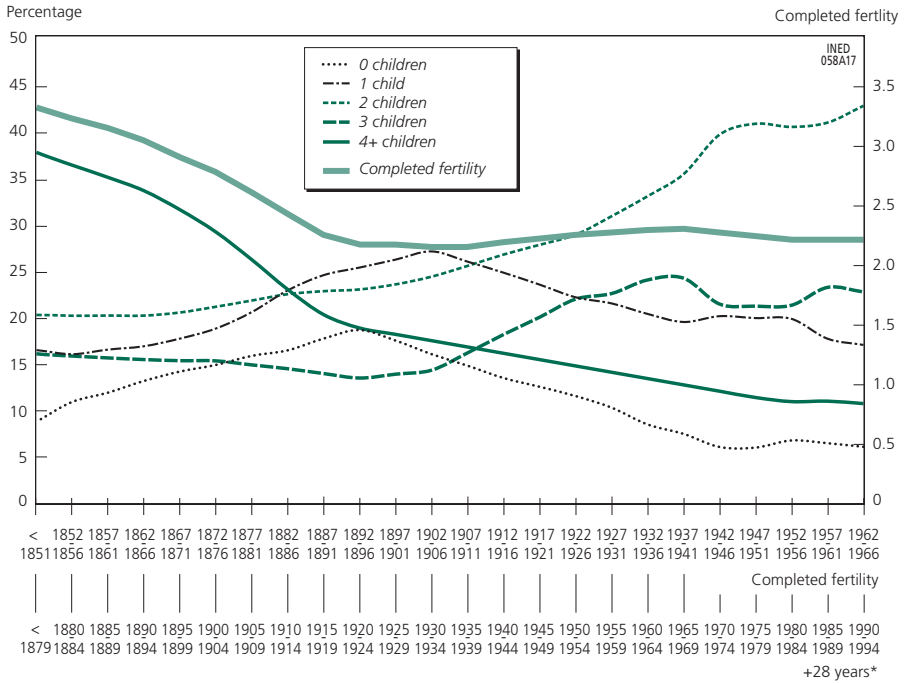
Figure A.4. Completed fertility of the cohorts according to different estimates



Interpretation: “If never-married women all had at least one child”: 90% with one child, 5% with two children, 3% with three children and 2% with four or more children.

Sources: Depoid (1941), Festy (1979), Chasteland and Pressat (1962). Estimate of the completed fertility of the 1857-1916 cohorts based on various sources and depending on whether permanent celibacy is derived from the 1946 census or from the estimate in Chasteland and Pressat (1962).

Figure A.5. Simulation of completed fertility and parities for ever-married women without the increase in large families between the 1897-1901 and 1942-1946 cohorts

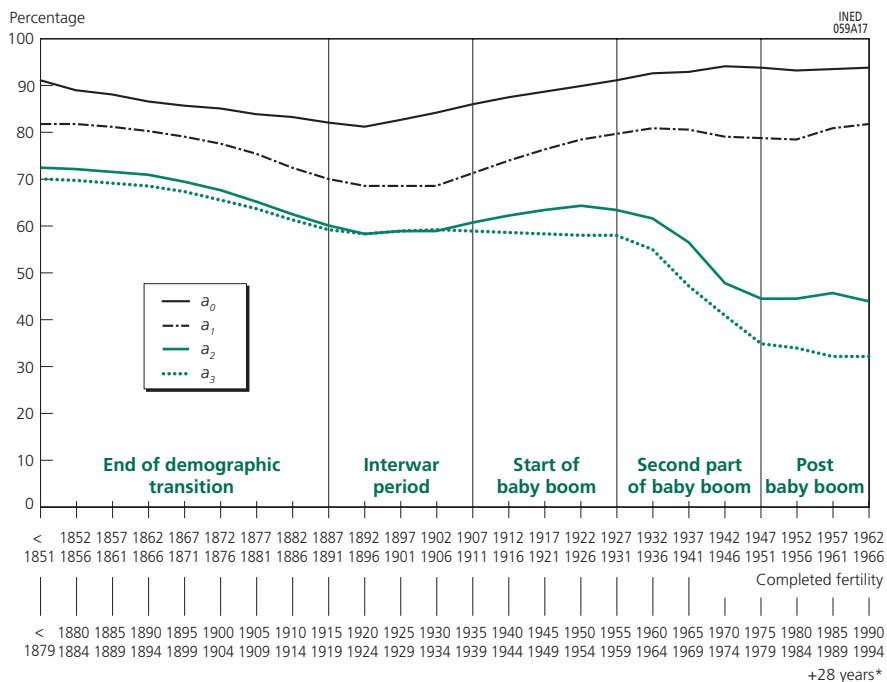


* The mean age at childbirth was 28 years for the oldest cohorts, and 27 years for the more recent ones (INSEE, population estimates and civil records). For ease of interpretation, an average age of 28 was added to the birth cohorts to give an idea of the reproductive period.

Note: This estimate produces a linear decrease in the percentage of large families from 13.25% for the 1937-1941 cohorts to 11.89% for the 1947-1951 cohorts, which completely wipes out the increase observed between those two groups of cohorts. The remaining share is distributed across the other parities according to the actually observed distribution.

Source: Author's calculations based on INSEE, population censuses, 1931, 1946; INSEE, ADISP-CMH, Enquête Famille, 1954, 1975, 1982, 1990; INSEE, ADISP-CMH, Étude de l'histoire familiale, 1999; INSEE, ADISP-CMH, Famille et logements, 2011.

Figure A.6. Parity progression ratios for ever-married women born between 1850 and 1966



* The mean age at childbirth was 28 years for the oldest cohorts, and 27 years for the more recent ones (INSEE, population estimates and civil records). For ease of interpretation, an average age of 28 was added to the birth cohorts to give an idea of the reproductive period.

Note: The parity progression ratios for the cohorts born after 1962 are for reference only (source: Famille et logements, 2011).

Source: Author's calculations based on INSEE, population censuses, 1931, 1946; INSEE, ADISP-CMH, Enquête Famille, 1954, 1975, 1982, 1990; INSEE, ADISP-CMH, Étude de l'histoire familiale, 1999; INSEE, ADISP-CMH, Famille et logements, 2011.



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Sandra BRÉE • CHANGES IN FAMILY SIZE OVER THE GENERATIONS IN FRANCE (1850-1966)

Through a longitudinal analysis of parities and parity progression ratios, this article charts the fertility of the cohorts of women born in France between 1850 and 1966. After reviewing the available sources and data (population censuses and family surveys), and the methods used for retrospective cohort analysis of fertility, the author proposes estimates of changing family sizes over more than a century. The simultaneous study of trends in family size and completed fertility enhances our understanding of fertility trends, and more specifically the impact of changes in each family size on overall fertility patterns. This refines the conclusions that can be drawn from an interpretation of averages (completed fertility) by showing that, for the same completed fertility, the parity distribution can be highly variable, and demonstrates that family size should always be taken into account when analysing fertility. This research also highlights the value of differentiating between the fertility of all women, of ever-married women and of never-married women, particularly when analysing childlessness and low fertility (one child).

Sandra BRÉE • ÉVOLUTION DE LA TAILLE DES FAMILLES AU FIL DES GÉNÉRATIONS EN FRANCE (1850-1966)

À travers l'analyse longitudinale des parités et des probabilités d'agrandissement, cet article retrace l'évolution de la fécondité des générations féminines en France nées entre 1850 et 1966. Après avoir présenté les sources et données disponibles (recensements de population et enquêtes Famille), et les méthodes utilisées pour l'analyse rétrospective de la fécondité des générations, l'auteure propose des estimations de l'évolution de la taille des familles sur plus d'un siècle. L'étude de l'évolution conjointe de la taille des familles et de la descendance finale améliore la compréhension des tendances de la fécondité, et plus particulièrement le poids de l'évolution de chaque taille de famille dans l'évolution générale de la fécondité. Elle nuance ainsi les conclusions que l'on pourrait tirer de la lecture des simples moyennes (descendances finales) en montrant qu'à descendance finale égale, la distribution des parités peut être très variable, et encourage à toujours prendre en compte la composition des familles dans l'analyse de la fécondité. Cette recherche souligne également l'intérêt de la différenciation de la fécondité de l'ensemble des femmes, des femmes ayant été mariées et des femmes célibataires, notamment dans l'analyse de l'infécondité et des basses fécondités (1 enfant).

Sandra BRÉE • EVOLUCIÓN DEL TAMAÑO DE LAS FAMILIAS A LO LARGO DE LAS GENERACIONES EN FRANCIA (1850-1966)

Conjugando el análisis longitudinal de las paridades y de las probabilidades de crecimiento de las familias, este artículo sigue la evolución de la fecundidad de las generaciones femeninas en Francia, nacidas entre 1850 y 1966. Después de presentar las fuentes y los datos disponibles (censos de la población y encuestas Famille), así como los métodos utilizados para el análisis retrospectivo de la fecundidad, la autora propone estimaciones de la evolución del tamaño de las familias durante más de un siglo. El estudio conjunta del tamaño de las familias y de la descendencia final mejora la comprensión de las tendencias de la fecundidad, y en especial el papel que ha jugado cada tamaño de familia en la evolución general de la fecundidad. Se matizan así las conclusiones que se podrían sacar de la simple lectura de las descendencias finales, y se muestra que para una misma descendencia final la distribución según el tamaño de las familias puede ser muy variable. Lo cual incita a tener siempre en cuenta la composición de las familias en el análisis de la fecundidad. En el artículo se subraya igualmente el interés de distinguir la fecundidad del conjunto de las mujeres, la de las mujeres casadas y la de las mujeres solteras, sobre todo en el análisis de la infecundidad y de la baja fecundidad (un hijo).

Keywords: fertility, cohorts, France, longitudinal analysis, retrospective analysis, historical demography

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