THE DEMOGRAPHIC PROFILE OF TWINS : TEMPTATION OF MIMETISM OR DISSIMILARITY AMONG CO-TWINS ? AN ILLUSTRATION THROUGH FIRST MARRIAGE AND ARRIVAL OF THE FIRST CHILD.

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The question of the similarity or dissimilarity of twins concerning demographic and social behaviours has been discussed in field of psychology, but has been also largely exploited with a more «sensationnal» approach in ordinary litterature or press. There is no doubt that, in many societies, twins evoluate under some «external» representations of twinning fact, representations that they can integrate and appropriate, or reject. Social pressure can be exerced on them at different level : from the family, friends, society in general. Our global work aims at evaluating twin's behaviours in demographic and social field by studying very basic facts as studies' and professional orientation, fertilty, nuptiality, and other. In this communication we will focus on first marriage and arrival of the first child.

On this purpose we will compare discrepancies between twin's pairs to those observed among ordinary couples of brothers and sisters of approximatively the same age, by controlling mainly for age, sex and familial composition, and other factors if necessary. Moreover this study will represent an occasion for estimating differences in behavioural patterns among twins themselves and for identifying special situations and risk's factors. Are the temptations of mimetism or dissimilarity stronger oder weaker between twins from a two children family and twins bred up in larger families? And even, can we notice differences between identical twins (of very close appearance) and fraternal ones (as different as two brother and sister)? Different strategies can be envisaged as they are not exposed to the same level of differenciation inside the family circle.

1. Data sources

Description of the data source: EDP
The frequency in twin births has experienced a spectacular increase in nearly all the industrialized countries during the last thirty years, under the joined effects of postponement of maternities and infertility treatments. In France, for example, the frequency of twin births increased from 8.9 out of 1,000 in 1972 to 15.0 in 2000 (a 70% increase) (Insee).
Our work is based on the exploitation of the French *Longitudinal Study* (EDP[1] or Permanent Demographic Sample). It gathers since 1967 in a single folder the statistic bills – census, civil registration - of all persons resident in metropolitan France and born during the first four days of October of each year, which represents a little more than 1% of births and of population. Data of people born before 1967, or those of recent immigrants (all born as well during the first four days of October), are collected as soon as indviduals complete one census or civil registration bill from 1967. The systematic collect of statistical bills – census and civil registration – allows us to study carefully basic demographic behaviours as studies' and professional orientation, fertility, nuptiality, death and other.

[1] Echantillon Démographique Permanent

Identification of twins' and brothers and sisters' couples: methodological considerations and final approach

The identification of twins and sisters and brothers couples has been largely inspired by a previous work on EDP by G.Desplanques (INSEE) who got also interested in twins questions[2]. First of all, considering the way the EDP sample is constituted, it systematically includes twins of a same pair (and triplets of a same groupe of triplets, and so on) since they are born the same day. On the contrary, the constraint on dates of births (between 1st and 4th of October) is more problematic for sisters and brothers identification by imposing us to select couples with *exactly* one year in age's difference (more or less four days), with *exactly* two years in age's difference (more or less four days), with *exactly* three years of age's difference (more or less four days), and so on ...

Two methods of identification for twins or fraternal couples were conceivable : the first one based on exploitation of the civil registration's bills of birth (but only from 1967 ...), the second one based on exploitation of family's declarations in the 1975 census. After having evaluated their respective qualities, we have finally adopted a mixed approach based mainly on the second option (more reliable, and providing a larger sample) [see note below].

Identification's procedure:

The first step has consisted in identifying children couples through 1975 census. Among the 201917 children born within the first four days of October between 1957 and 1974 , and present in EDP, we have selected children present in the 1975 census, either born the same year at the same place[3] (twins), either born at different years (sisters and brothers) :

- that are declared as children,
- within the same household and the same family (number of children of the family, number of persons in the household, 'biological structure' of the household),
- whose family's head presents the same characteristics (sex, age, matrimonial status, nationality, socioprofessional category and employment's status, diploma).

In the second step, we have added couples of children - not previously identified - born between 1967 and 1974:

- that are declared as children, within the same household and the same family (see above), in the 1975 census
- whose parents present the same characteristics as completed in the civil registration bill of birth of each child : date (year, month and day) and place (country, department and municipality) of birth for both father and mother.

Finally our sample gather **201,917** children born between 1957 and 1974, and among them:

Type of couples	**Twins pairs**	**Brothers and sisters pairs**
Number	1,136 couples (49 added by the second step)	1,387 couples (26 added by the second step)
Composition by sex	375 couples with two boys 361 couples with one boy and one girl 400 couples with two girls	347 couples with two boys 685 couples with one boy and one girl 355 couples with two girls

Source: EDP

Please note that our method naturally implies some bias since we observe couples of children living in the same household and family in 1975. The eventual separation of children (resulting for example from a divorce or separation of the biological parents) can not be taken into account. Moreover we only observe couples still present in 1975, that means after possible effects of mortality, or even migration: if one twin died before 1975, its co-twins will

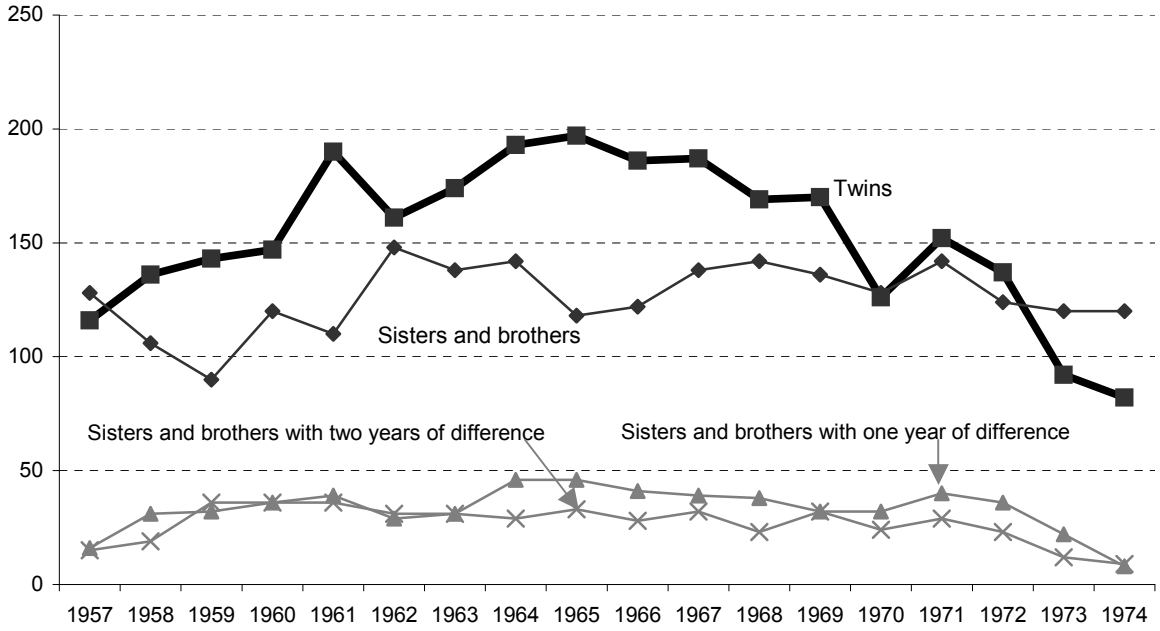
[2] G.DESPLANQUES, communication to the « Frères, sœurs, jumeaux. Passé et présent des fratries » congres, XVIème Entretiens Jacques Cartier, Lyon, 1-2 december 2003.
[3] Country, department and municipality.

be identified as single child whereas if both died before 1975, there will subsist no trace of their birth also. The possible bias implied by our method and their effect are discussed below.

Evaluation of our sample's quality:

The figure 1 shows the number of selected children – twins, and brothers and sisters – according to the year of birth. The curves are quite similar.

Figure 1: Number of twins and sisters and brothers selected in EDP, according to year of birth.

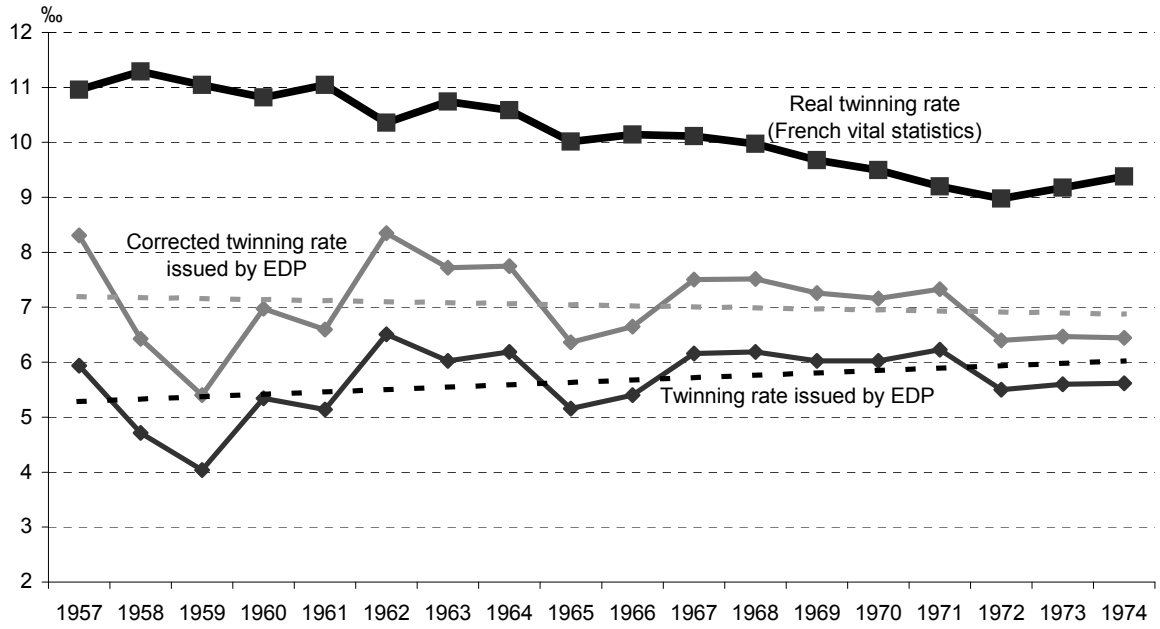


Source : EDP

Going further, if we now report these numbers of twins to the total number of births registered in EDP for each year, the comparison with French vital statistics reveals that our source doesn't reflect a correct picture of the phenomenon (see figure 2). Whereas twinning rate should decrease regurlarly from 1957 to 1974, ours issued from EDP increases: we observed also a - sensible but - decreasing underestimation of the twinning rate. This configuration could be related to the over-mortality of twins. If during the period the mortality of twins has decreased faster than the one of single children (for example if these mortalities are in a proportional link), the effect of overmortality of twins has decreased with time, reducing underestimation of twin's deliveries. Infant mortality is attested to be two to nine times higher for twins than for 'simple' children[4], and the 1960-1970's were time of speed reduction of infant mortality in France (passing from 33.80‰ to 14.60‰ during the period 1957-1974). It may not be absurd to suggest that these progresses have more influenced mortality of more fragile children, that is in particular multiple births.

[4] Duchesne, 2001 for Quebec(2001); Pison, 1991 for Afrika(1975-1987); Botting, Macdonald and Macfarlane, 1987 for England-Wales(1982-1984); Pons, Richard and Papiernik, 1991 for France(1979-1989).

Figure 2: Comparative twinning rates (number of twin's delivery for 1,000 deliveries), 1957-1974



Sources : EDP, French vital statistics

If we correct the number of twins selected in EDP, arguing that their mortality is five times higher than the one observed among single children, we obtained a figure sensibly closer to the real one (see figure 2): the corrected twinning rate is now slightly decreasing and evoluating at a level closer to the one issued by French vital statistics for this period. Note however that we would need a ratio-mortality between twins and 'simple' children of ten, for corrected twinning rate reaching the level issued by civil registration: we have so to point out that biais mentionned before and implied by our method of identification are without doubts responsible for a sensible underestimation of twinning rate. This point is confirmed by study of following more detailed figures concerning twins selected in EDP, in comparison with corresponding data from French vital statistics (table 1).

Table 1: Estimations of twinning rates (‰) - Comparisons with French vital statistics

1957-1974	Twinning rate	Fraternal twinning rate (2)	Identical twinning rate (2)	Proportion of identical twins
EDP	5.66	3.60	2.06	36.40%
EDP corrected of twin's overmortality (1)	7.03	4.47	2.56	36.42%
French vital statistics	10.16	(3)	(3)	(3)
1960-1974	**Twinning rate**	**Fraternal twinning rate (2)**	**Identical twinning rate (2)**	**Proportion of identical twins**
EDP	5.81	3.73	2.08	35.80%
EDP corrected of twin's overmortality (1)	7.09	4.55	2.54	35.83%
French vital statistics	9.83	6.07	3.76	38.25%

(1) : hypothesis that mortality of twins is five times higher than the one observed among single children.
(2): fraternal and identical twinning rates have been estimated by the Weinberg method assuming that fraternal twins pairs are twice more numerous than twins pairs of different sex.
(3): data from French civil registration don't provide sex composition of twins deliveries from 1956 to 1959.
Source: EDP, French vital statistics

Please note however that, except the constant underestimation in the level of twinnig rate (global, fraternal, identical), the other controls made on the quality of our sample are positive: global twinning rate increasing with age of the mother (resulting from the increase of fraternal twinning rate with age at childbearing, whereas identical twinning rate is remaining almost constant), (fraternal) twinning rate higher among women of specific nationalities (as african), (fraternal) twinning rate increasing with rank of delivery .....

To finish with, EDP doesn't permit us to distinguish identical (monozygotic) from fraternal (dizygotic) twins, but it will be possible to estimate indirectly differences among the two types of twins by comparing twin's pairs of same sex (which gather all monozogothic twins and a part of dizygotic twins) to twin's pairs of different sex (which gather remaining dizygotic twins).

2. As individuals, female twins are significantly more reluctant to marry or to have children….

Data for first marriage and first child were collected in EDP from the first marriage and birth bills from French civil registration. These data present specific problems of estimation since they are affected by right-censoring : EDP has actually collected bills until 2003, and observations of events can also suffer from possible deaths or migrations of individuals. Concerning censorship by date of observation (2003), please note that the children of our sample are aged between 29 and 46 in 2003, so that the bias can absolutely not be neglicted if we study nuptiality's or fecundity's patterns. Moreover, the collect of these bills for EDP's individuals born on 2nd or 3rd of October (from 1957 to 1974 in our sample) has been - more or less - stopped from 1/1/1982 to 31/12/1997, for economic motivations. Fortunately, by examining 'first' marriage or birth bills collected after 1997, or taking into account declarations to the 1999 census, we have been able to find out most of individuals affected by this measure. Concerning first marriage we can provide for them an interval of date (1982-1997) - or age -, in which event occured: we speak then of 'interval of censorship'. Concerning first birth, 1999 census allow us to find out most of missing first births[5], and finally only 1000 persons couldn't be 'corrected' and could just be provided a time interval in which first birth occurred.

To account for censoring, estimations have been drawn through duration models. At first, the global approach has been based on Kaplan-Meier method for non parametric estimation of survival function. But it can only be implemented on individuals born on 1st or 4th of October, since not taking into account intervals of censorship. Will be considered as censored every individual whose wedding/first birth has not been observed until 2003, or/and has died before getting married. Concerning migration, we had unfortunately no satisfying solution to control by it, and have just finally selected people still present at the 1999 census[6].

Table 2 : Estimated proportions of single persons, at age 30 and 40. Kaplan-Meier method.

(%)	**Men**				**Women**			
	Twins			Single M	Twins			Single F
	from MM (1)	from MF (1)	Total		From FF (1)	from MF (1)	Total	
At age 30	54.3	56.8	55.1	56.6	42.2	47.8	43.9	45.6
At age 40	36.2	43.6	38.1	40.9	29.0	36.9	31.3	34.5

[5] Assuming however that children declared by individuals in the 1999 census are their biological ones, and that their first child didn't already left parental home in the meantime.

[6] We could also have assumed that it would not introduce significant bias since twins have *a piori* no reason to be more 'mobile' than single children.

Table 3 : Estimated proportions of persons without any child, at age 30 and 40. Kaplan-Meier method

(%)	Men				Women			
	Twins			Single M	Twins			Single F
	from MM (1)	from MF (1)	Total		from FF (1)	from MF (1)	Total	
At age 30	54.3	57.1	55.2	58.0	34.6	41.2	36.7	40.1
At age 40	29.7	33.6	31.0	33.5	19.6	21.9	20.4	23.1

(1): We have classified twins pair by sex composition: MM (two boys), MF (one boy and one girl), FF (two girls). Source: EDP (Individuals born on 1st or 4th of October)

Compared to 'simple' children[7], twins belonging to pairs of same sex tend to get more married, as well as to be more frequently parents, whereas those belonging to pairs of different sex are on contrary more at risk to remain single or without any child, at least until age 40. This fact is true as well among men and women. Despite this interesting parallelism, we have although to underline that, for men and women, these differences observed between twins and 'simple' children, as well as within the two different types of twins pairs, are not significant[8].

Even reflecting a real phenomenon, these preliminary results have to be precised and their relevance examined after control by factors that may influence attitudes towards marriage or fecundity. Non parametric estimations through Kaplan-Meier approach can't be pursued, since we have too few twins in our sample. This is explaining why we have finally favoured semi-parametric estimations by duration models as Cox, or accelerated failure time models. The second one is very appreciable since allowing simple estimation of durations belonging to an interval of censorship, as it is the case for many of our observations what is concerning first marriage (see above), and by allowing us by the same way to keep maximum sample size. Through accelerated failure time models, we have so firstly estimated the duration in state of 'being single' or 'being without any child' according to several factors. Couples of brothers and sisters have allowed us to control for what is not linked to twinning fact, but rather to brothers and sisters relations: e have been so able to compare for example a male twin belonging to a MM pair to a male member of a MM brothers couple, according to the size of their family. Both were also controled by 'standard' male children who allow to take correctly into account influences of familial background

Results are presented in table 4. We will not comment parameters relative to 'control variables': they are quite expectable (except for diploma of family head in men's estimations[9]), and coherent from one estimation to one another. After control by some general factors influencing attitude towards marriage and fecundity, it finally appears that only female twins present specific behaviours. According to the first specification, they show general reluctance to get married or to become mother, wathever the size of their family, except for those belonging to FF pairs and within a family where they are the only children. According to value of parameters, and distinguishing by size of the family, female twins belonging to MF couples seem to be systematically less keen to get married or become mother, than female twins belonging FF pairs. MF twins pairs could represent a kind of 'perfect couple' (a man, a woman), whose impact in terms of representation is independent of the size of the family (see second specification and non significant difference between

[7] After having realized some controls, it appears that EDP's estimations of single persons and of persons without any child, whatever may be the sex of individuals or their age, are constantly underestimating real phenomenons by around 5 to 6%, due to to the inevitably incomplete collect of statistical bills.... But we may assume that these deficiencies will not differentially affect twins and 'simple' children.

[8] P>40% for men's tests, P>30% for women's tests (Test of equality over strata, Kaplan-Meier estimation)

[9] This surprising result - suggesting that graduate men (as inheritating the competences of their family head) have more difficulty to get married or to have children - has surely to be related with the fact that these qualified men tend to marry or have children later, and that our sample only provide – and imperfectly – observations until age 46, so that behaviours at older ages are less easely taken into account. Moreover behaviours after age 46 are absolutely not considered.

female MF twins according to size of their family). On contrary, the difference is significant among female twins belonging to FF pairs according to the size of their family. Those belonging to larger families may show reluctance to 'break' their couple since their twinning characteristic may have been more constructive of their identity towards other children of the family (this fact could be however only true for identical twins, as they present moreover high resemblance). This could be why we don't observe similar phenomenon among FF twins belonging to families where they are the only children.The question to know why this considerations may not be relevant for men could be linked for example to place, representations or education of women. Note however for men that in some cases parameters aren't far from being significant (at a 10% level).

All these results apparently contradict former observations from table 2 and 3 that suggested that twins were more eager to marry or have children. In fact, twins tend to belong more frequently to types of "familial backgrounds" heightening (early) marriage and fecundity, so that they globally appear to get more often married as well as to be more frequently parents. The influence of these major environmental factors is overwhelming eventual 'twin effect'. To finish with, the fact that characteristics relative globally to brothers and sisters couples (including twins) are mostly not significant can rassure us about the quality of our 'control's sample'.

4. Temptation of mimetism or dissimilarity: preliminary results suggesting mimetism strategies in some cases...

In our sample, we can find 10 twins couples that got married at exactly the same date (year, month, day), whereas we can only find one brother and sister couple that got married the same year and month, but not the same day.... Outside these eventually remarkable cases, what can we say about eventual strategies of twins couple in nuptiality and fecundity ? To answer this question we have studied how first marriage or arrival of first child for twins could be influenced by behaviours of their own counterpart. We have so implemented Cox model for estimation of semi-parametric hazard function, that allows introduction of dependent time variables. This kind of model can not be implemented if there are problems like intervals of censorship, so that we have focused on arrival of the first child (where data are more standard thanks to corrections, see above). As before, couples of brothers and sisters have allowed us to control for what is not linked to twinning fact, but rather to brothers and sisters relations: as before, we have so compared for example a male twin belonging to a MM pair to a male member of a MM brother couple. Both were also controled by 'standard' male children who allow to take correctly into account influences of familial background. Dependent time variables indicating the moment when the counterpart of twins, or the one of members of standard brother and sisters couple, got first child were introduced to evaluate the effect of mimetism strategies. Technical limitations have led us to present, for the moment, very preliminary results based on reduced samples; 'Extended' results will be ready for PAA Conference.
Preliminary results are presented in table 5. They confirm previous results and suggest that couple's strategies are relevant for pairs of same sex as well among 'standard' brothers and sisters as among twins: a child will be positively influenced by the first marriage or the first parenthood of its partner for its own realizations. A positive marginal effect is remaining for female FF twins, suggesting that, if they don't differ individually from other FF couples of sisters (see above), they however developp inside their couple stronger mimetism.

5. Further researches

Next researches will get interested in linking over life course behavioural patterns of nuptiality and fecundity of twins, for approaching more globally –and across time - strategies of twins couples. It will also focus on characteristics of marital partners of twins and will get inspired by methods developped for studying homogamy among couples.

Table 4: Results from Accelerated Failure Time Models

Note about the sign of parameters: The accelerated failure time model estimates the duration until occurrence of the event so that a positive parameter means that the variable has a negative effect on occurrence of the event.

	MEN				WOMEN			
	First marriage		First child		First marriage		First child	
	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.
Intercept	1.787	<.0001	1.781	<.0001	1.769	<0.001	1.762	<.0001
FAMILIAL BACKGROUND								
Nationality of the family head (Source: census 1975)								
French	REF		REF		REF		REF	
Foreign	0.007	<.0001	0.005	<.0001	0.008	<0.001	0.010	<.0001
Unknown	0.018	<.0001	0.007	<.0001	0.021	<0.001	0.011	<.0001
Occupation of family head *(Source: census 1975)								
Farmer	-0.003	0.003	0.001	0.051	-0.006	<0.001	0.004	<.0001
Manager (industry and trade)	n.s.	n.s.	n.s.	n.s.	0.003	0.021	0.006	<.0001
Professional occupation	n.s.	n.s.	0.007	<.0001	0.007	<0.001	0.013	<.0001
Intermediate occupation	0.004	0.0003	0.006	<.0001	0.009	<0.001	0.010	<.0001
Worker	0.003	0.008	0.004	<.0001	0.003	0.004	0.004	<.0001
Employee	REF		REF		REF		REF	
Low qualified service's staff (maid)	0.006	0.007	0.005	0.002	0.004	0.079	n.s.	n.s.
Other (clergy, artist, army and police)	n.s.	n.s.	0.004	0.001	n.s.	n.s.	0.006	<.0001
Non working person	n.s.	n.s.	0.003	0.005	n.s.	n.s.	-0.003	0.0004
Diploma of family head (Source: census 1975)								
None	-0.001	0.027	-0.002	<.0001	-0.006	<0.001	-0.007	<.0001
High school degree or below	REF		REF		REF		REF	
Higher degrees	0.004	0.004	0.004	<.0001	0.013	<0.001	0.007	<.0001
Maximum number of children in the family (Source: census 1975, 1982, 1990)								
One	n.s.	n.s.	0.002	0.004	-0.004	<0.001	0.001	0.032
Two	REF		REF		REF		REF	
Three	-0.003	0.0002	-0.004	<.0001	-0.004	<0.001	-0.005	<.0001
Four	-0.004	<.0001	-0.005	<.0001	-0.006	<0.001	-0.009	<.0001
Five	-0.004	0.002	-0.006	<.0001	-0.009	<0.001	-0.013	<.0001
Six	-0.003	0.036.	-0.006	<.0001	-0.008	<0.001	-0.015	<.0001
Seven or more	n.s.	n.s.	-0.007	<.0001	-0.003	0.022	-0.017	<.0001
Unknown	-0.012	<.0001	-0.003	0.003	-0.015	<0.001	-0.011	<.0001

Place of birth of ego (Source: census 1975, civil registration)									
France	REF		REF			REF		REF	
Out of France	0.008	<.0001	0.002	0.0002		0.013	<0.001	0.005	<.0001
CONTROL BY CHARACTERISTICS OF COUPLES OF BROTHERS AND SISTERS (INCLUDED TWINS)									
Belonging to a MM pair within a two children family	0.0003	0.964	0.0105	0.062	Belonging to a FF pair within a two children family	0.005	0.453	0.0062	0.1983
Belonging to a MF pair within a two children family	0.0010	0.890	0.0014	0.778	Belonging to a MF pair within a two children family	-0.0074	0.289	-0.0065	0.158
Belonging to a MM pair within a family of three or more children	0.0036	0.229	0.0024	0.274	Belonging to a FF pair within a family of three or more children	-0.0043	0.151	-0.0038	0.048
Belonging to a MF pair within a family of three or more children	0.0062	0.043	-0.0003	0.885	Belonging to a MF pair within a family of three or more children	-0.0011	0.724	-0.0002	0.921
CHARACTERISTICS OF TWINS									
First specification									
Belonging to a MM twin pair within a two children family	0.0125	0.217	-0.0011	0.883	Belonging to a FF twin pair within a two children family	-0.0105	0.284	-0.0027	0.682
Belonging to a MF twin pair within a two children family	0.0153	0.213	0.0145	0.116	Belonging to a MF twin pair within a two children family	0.0234	0.064	0.0147	0.074
Belonging to a MM twin pair within a family of three or more children	-0.0020	0.639	-0.0029	0.348	Belonging to a FF twin pair within a family of three or more children	0.0122	0.003	0.0087	0.001
Belonging to a MF twin pair within a family of three or more children	-0.0057	0.280	-0.0035	0.348	Belonging to a MF twin pair within a family of three or more children	0.0097	0.068	0.0081	0.020
Second specification									
Belonging to a MM twin pair	-0.0036	0.378	-0.0036	0.226	Belonging to a FF twin pair	0.0133	0.001	0.0093	0.0004
Belonging to a MF twin pair	-0.0060	0.244	0.0032	0.375	Belonging to a MF twin pair	0.0095	0.071	0.0076	0.027
Belonging to a MM twin pair within a two children family	0.0161	0.140	0.0025	0.752	Belonging to a FF twin pair within a two children family	-0.0238	0.025	-0.0120	0.089
Belonging to a MF twin pair within a two children family	0.0213	0.110	0.0113	0.257	Belonging to a MF twin pair within a two children family	0.0139	0.309	0.0071	0.426

*: excuse for often approximative translations of this variable's modalities, due to lack of standardization of nomenclatures about 'socio-professional category'.
Note: n.s. refers to parameters non significant at a 10% level

Details:
Men born from1957 to 1974 and present at the 1999 census (80,495 observations for first marriage, 80,409 observations for first child)
Women born from1957 to 1974 and present at the 1999 census (82,301 observations for first marriage, 82,178 observations for first child)

Table 5: Preliminary results from the Cox Models with dependent time variables

Note about the sign of parameters: The Cox model estimates hazard function so that a positive parameter means that the variable has a positive effect on occurrence of the event (first marriage, first child).

	WOMEN				MEN			
	From a FF pair		From a MF pair		From a MM pair		From a MF pair	
	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.
FAMILIAL BACKGROUND								
Nationality of the family head (Source: census 1975)								
French	REF		REF		REF			
Foreign	-0.495	<.0001	-0.477	<.0001	-0.316	<.0001		
Unknown	-0.367	<.0001	-0.364	<.0001	-0.251	<.0001		
Occupation of family head (Source: census 1975)								
Farmer	-0.125	<.0001	-0.119	0.0001	n.s.	n.s.		
Managers (industry and trade)	-0.138	<.0001	-0.132	0.0001	n.s.	n.s.		
Professional occupation	-0.288	<.0001	-0.300	<.0001	-0.115	0.011		
Intermediate occupation	-0.237	<.0001	-0.215	<.0001	-0.125	0.0005		
Worker	-0.087	0.006	-0.082	0.012	-0.059	0.094		
Employee	REF		REF		REF			
Services staff	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.		
Other (clergy, artists, army and police)	-0.189	0.0006	-0.18	0.0008	n.s.	n.s.		
Non working person	n.s.	n.s.			-0.082	0.067		
Diploma of family head (Source: census 1975)								
None	0.143	<.0001	0.136	<.0001	0.056	0.013		
High school degree or below	REF		REF		REF			
Higher degrees	-0.206	<.0001	-0.200	<.0001	-0.096	0.044		
Maximum number of children in the family (Source: census 1975, 1982, 1990)								
One	n.s.	n.s.	n.s.	n.s.	-0.080	0.013		
Two	REF		REF		REF			
Three	0.129	<.0001	0.135	<.0001	0.056	0.026		
Four	0.168	<.0001	0.193	<.0001	0.138	<.0001		
Five	0.292	<.0001	0.283	<.0001	0.067	0.079		
Six	0.298	<.0001	0.285	<.0001	n.s.	n.s.		
Seven or more	0.408	<.0001	0.362	<.0001	0.200	<.0001		
Unknown	0.220	<.0001	0.224	<.0001	n.s.	n.s.		
Place of birth of ego (Source: census 1975, civil registration)								

France	REF		REF		REF	
Out of France	-0.283	<.0001	-0.288	<.0001	-0.228	<.0001
CONTROL BY CHARACTERISTICS OF COUPLES OF BROTHERS AND SISTERS (INCLUDED TWINS)						
Being part of a two children family	-0.025	0.848	0.126	0.284	-0.248	0.110
Being part of a family of three or more children	0.138	0.034	-0.002	0.974	-0.103	0.166
To be the younger	REF		REF		REF	
To be the eldest	-0.290	0.002	-0.143	0.124	-0.181	0.083
CHARACTERISTICS OF TWINS						
Being part of a two children family	-0.238	0.168	-0.443	0.033	-0.089	0.653
Being part of a family of three or more children	-0.449	<.0001	-0.274	0.006	-0.073	0.442
TIME DEPENDENT VARIABLE FOR TWINS AND BROTHERS AND SISTERS PAIRS : Partner having a child and....						
Ego and its partner being part of a pair with less than three years of age's difference (including twins)	0.235	0.058	0.064	0.704	0.364	0.019
Ego and its partner being part of a pair with at least four years of age's difference	0.302	0.021	0.171	0.287	0.241	0.137
Ego and its partner being twins	0.467	0.003	0.145	0.554	0.203	0.281

Note: n.s. refers to parameters non significant at a 10% level

Details:
Men belonging to a MM pair : 27,330 observations, chi-square=664 (28 DF)
Women belonging to a FF pair : 26,461 observations, chi-square=1567 (28 DF)
Women belonging to a MF pair : 26,022 observations, chi-square=1408 (28 DF)