



## Family Formation and Urbanization

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# FAMILY FORMATION AND URBANIZATION

*Although migration is almost always attributed to economic causes, in fact its demographic motives are often important. Migration influences both an individual's future marriage and family patterns – people leave home more readily when they are single, and are more ready to produce children in societies in which fertility is high.*

*It is difficult to study the interactions between these life events without detailed data, and this is why Daniel COURGEAU\* has organized a survey to collect data on occupational, family and migration histories.*

*Using an original method which he has outlined in an earlier article\*\*, he demonstrates here how migration affects behaviour patterns and how certain behaviour patterns may induce migration.*

In France, information obtained in censuses and particularly in surveys of families has already thrown light on the different ways in which families are formed and later dissolved depending on the characteristics of the individuals involved. These studies have shown differences in migration behaviour between urban and rural areas, and between different "départements" and regions. It has thus been possible to demonstrate differences in the timing of marriage [12] and fertility ([1],[2],[7],[10]) of individuals who at the time of the study lived in different parts of the country.

However, although different events in the family life-course (date of marriage, birth of children, etc.) are recorded in such surveys, usually only the individual's place of birth and place of residence at the time of the survey is given. Therefore, we cannot judge how migration to an area in which nuptiality or fertility differs from that in the place of origin may influence marriage, or the decision to have children. Conversely, we cannot analyse the effect of marriage or the birth of a child on an individual's future mobility, simply because the dates of these migrations are not known.

The INED "*Triple Biographie*" survey [11] of family, occupational and migration histories makes such an analysis possible because suc-

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\* INED.

\*\* "Relations entre cycle de vie et migrations", *Population*, 3, mai-juin 1984, pp. 483-514.

cessive dates of each event in the three biographies are recorded. The survey cannot prove causal connections, since this is impossible in the social sciences, but it does show interactions between the formation of the family and the process of urbanization. It may be assumed that if an event in the family life-course induces migration to a home better suited to the family's new size, then conversely migration to a metropolitan area may delay or even change certain decisions about family formation. The survey, therefore, provides an opportunity for an accurate test of several hypotheses [9].

This article will deal with two stages in the family life course : formation of the couple through marriage, and the birth of successive children. We shall not go beyond the third birth, given that the size of the sample (4,601 people) would have provided too few examples of larger families. Also, because the individuals interviewed were born between 1911 and 1935, we have not been able to study cohabitation before marriage, which was very rare in these cohorts.

It is possible to distinguish between areas with different densities of urbanization in a number of ways. We refer here to the great "metropolitan areas" centred around the capital, Paris, and the regional capitals, Lyons and Marseilles. The last of these extends along a section of the Mediterranean coast. To define these metropolitan areas more accurately, we adopted the method used by Y. Tugault [13] who identified the French "*départements*" in which the urban population formed the majority : Seine, the ring of "*départements*" forming the old Seine-et-Oise, Rhône, Bouches-du-Rhône, and the Alpes-Maritimes. To these we have added Var, in which the proportion of the urban population reached 70 % in 1936, but we have excluded the "*département*" Nord, in which although 75 % of the population were urban, the form of urbanization was very different – the number of rooms per dwelling is higher, and the proportion of individual houses as opposed to flats is the highest in France, etc. Furthermore, the fertility of this "*département*" is greater than in the others mentioned. All other areas of the country including this "*département*" are considered as "non-metropolitan areas" for the purposes of this study.

In this article, we shall investigate whether migration into or out of a metropolitan area modifies the formation of the family, and conversely whether the different stages in family formation modify migration behaviour. To avoid taking short-term migrations into account, we shall only consider migrations that lead to residence lasting three years or more in the place of destination. This allows us to exclude temporary migrations by, for example, civil servants or military personnel.

We shall undertake this analysis in two ways. First, using a nonparametric approach, we shall consider the sequence of events throughout an individual's life-course, and thereby demonstrate how the occurrence

of one life-event alters the probability of the occurrence of others. Next, we shall use a semiparametric approach to introduce various characteristics likely to influence marriage, fertility and migration. This will allow us to study the effect of these characteristics on each of these three phenomena, while retaining the possibility of calculating the modifying effect of each on the other.

These methods will make it possible for us to analyse with great precision the interactions between family formation and urbanization.

**Data used** The "*Triple Biographie*" survey has been presented in greater detail elsewhere ([4], [11]). In this article we will study all those interviewed (4,601 individuals), separately for each sex, and divided into broad cohorts. We thus obtain a sample of 2,105

TABLE A. - VARIABLES

Variables	Index of			
	nuptiality		women's fertility	
	men	women		
— none	0	0	0	
— CEP only	1	0	1	
Educational Level — certificate of apprenticeship (CAP) or technical baccalauréat	2	1	3	
— at least baccalauréat or higher education	2	2	2	
Eldest Child — eldest	1		1	
— not eldest	0		0	
Siblings	number		number	
Parents' residence during subject's childhood — metropolitan area	1		1	
— non-metropolitan area	0		0	
Nationality — naturalized or foreign	1		1	
— born French	0		0	
Father's occupation — farmer or farm worker	1		1	
— other	0		0	
First or previous occupation — never worked	0	0	women 0	spouses 0
— farmer or farm worker	0	1	1	0
— manual or unskilled worker	1	2	2	1
— skilled worker, professional, commerc. and indust. management	2	3	3	2
— middle management and other employees	2	3	4	3
Type of dwelling — in parents' home or home owner	0		0	
— tenant or other	1		1	

women who on their 14th birthday lived in a non-metropolitan, i.e. little-urbanized, area, of whom 1,278 were born between 1911 and 1925 and 827 between 1926 and 1935, and a sample of 446 women who lived in a metropolitan area at their 14th birthday. The small number in this last group prevents any sub-division into smaller cohorts. For men, the figures are 1,704 who lived in a non-metropolitan area on their 14th birthday, of whom 929 were born between 1911-1925 and 775 between 1926-35, and 346 men who lived in a metropolitan area on their 14th birthday.

The variables used in the semiparametric analysis are indicated in Table A. Some are coded differently according to the sex of the subject and the event studied. This choice was based on analyses of earlier INSEE surveys ([7], [12]) which involved far larger samples, and on our own tests. Here only a small number of variables can be studied given the limited nature of our sample.

**Methods of analysis**

We shall only present a schematic diagram to show the links between marriage and migration, and the same scheme is used for the links between migration and the birth of successive children. In Diagram 1 we show the various possible states in which a person can be living, and the transition intensities between these states, which we need to estimate.

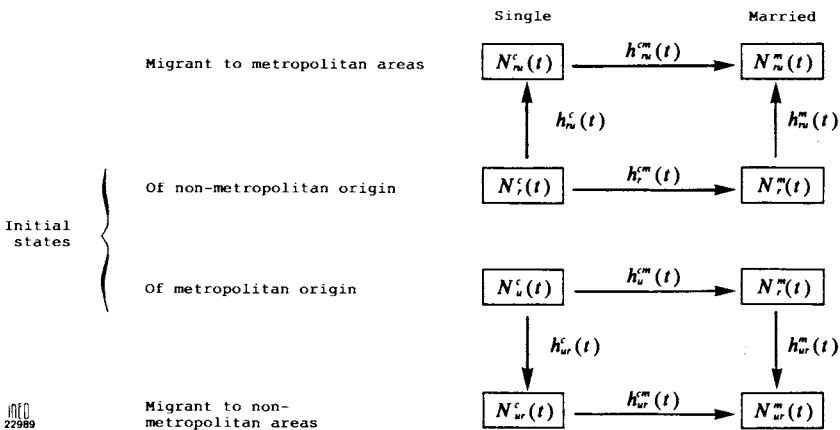


Diagram 1. – Different states in which an individual may be living and the hazard rates of transition from one to another

For example, at time  $t$ , the migration hazard rate for the  $N_r^c(t)$  individuals, still single and living in non-metropolitan areas, will be  $h_{ru}^c(t)$  and the marriage hazard rate will be  $h_r^c(t)$ .

When out-migration and marriage occur during the same year, the individuals are excluded from the population at risk, as if they had ceased to be observed on the date when each of these events occurred. In consequence, simultaneous occurrences were excluded, but it is useful to include them in certain cases in order to represent the individual behaviour patterns more clearly. When this was done we state it explicitly.

Thus, we can compare the marriage hazard rate of those individuals who remained in the non-metropolitan area,  $h_r^c(t)$ , with the rates for those who had already migrated to a metropolitan area  $h_{ru}^c(t)$ . This last hazard rate will also depend on the age of the individual at the time of migration ( $\theta$ ), and should therefore be written  $h_{ru}^c(t\theta)$ . Here, we have assumed that this dependence will only affect the hazard rate slightly.

Under these conditions it is possible to test the equality of the different nuptiality and migration hazard rates, by using methods which have been presented in an earlier article [6].

To show the effect of the various characteristics on these hazard rates we use the following semiparametric model :

$$h(t: z) = h(t) \exp [Z\beta_1 + H(t - u) (\beta_0 + Z'\beta_2)]$$

where  $\beta_1$ ,  $\beta_0$  and  $\beta_2$  are the coefficients to be estimated by using variables  $Z$  (intervening before the modifying phenomenon) and  $Z'$  (intervening after the modifying phenomenon, and which may be equal to or different from  $z$ ),  $H(x)$  is the Heaviside function ( $H(x) = 0$  for  $x \leq 0$ ,  $H(x) = 1$  for  $x > 0$ ),  $u$  is the date of the modifying phenomenon,  $h(t)$  the nonparametric baseline hazard. In this model it is assumed that the different variables exercise a multiplicative effect on the estimated hazard rate.

We also have tests that enable us to judge whether a group of variables affects the phenomenon under study, and these are presented in detail in [6].

## I. - Nuptiality and urbanization

We look first at the reciprocal relations between marriage and mobility, using nonparametric methods, before considering the effect of social and occupational characteristics.

### *Marriage and mobility*

In Figure 1 we show the cumulated nuptiality hazard rates of women who lived in metropolitan and non-metropolitan areas at their 14th birthday. In both cases a slight delay in timing of marriage can be seen amongst migrants,

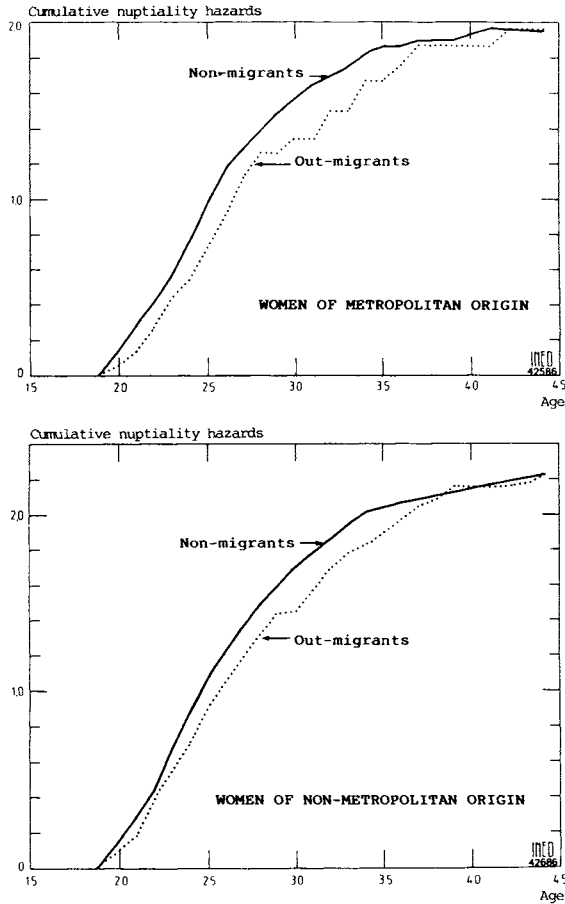


Figure 1. – Cumulative nuptiality hazards for migrant and non-migrant women according to their origin

most significantly between ages 21 and 31 for women from non-metropolitan areas and at various ages between 20 and 31 for the others. This delay is made up after the age of 40. The proportion never married at this age comes to 8 % for women from non-metropolitan areas, irrespective of whether they remain there or emigrate, and to 12 % for those from metropolitan areas. This result confirms other observations ([12], p. 102), which have shown that the likelihood of remaining single is higher in cities than elsewhere. It is interesting that there is a slight delay in marriage amongst migrants, linked to a period of adaptation on arrival in the new environment, but this delay is entirely made up later.

Men's behaviour is different. In Figure 2 we show the cumulated nuptiality hazard rates of men who lived in the metropolitan and non-metropolitan areas at their 14th birthday. In both cases, the proportion never married at their 45th birthday is lower among migrants than among those who remained in their place of origin. This is true for men from non-metropolitan areas from their 30th birthday, and for those from

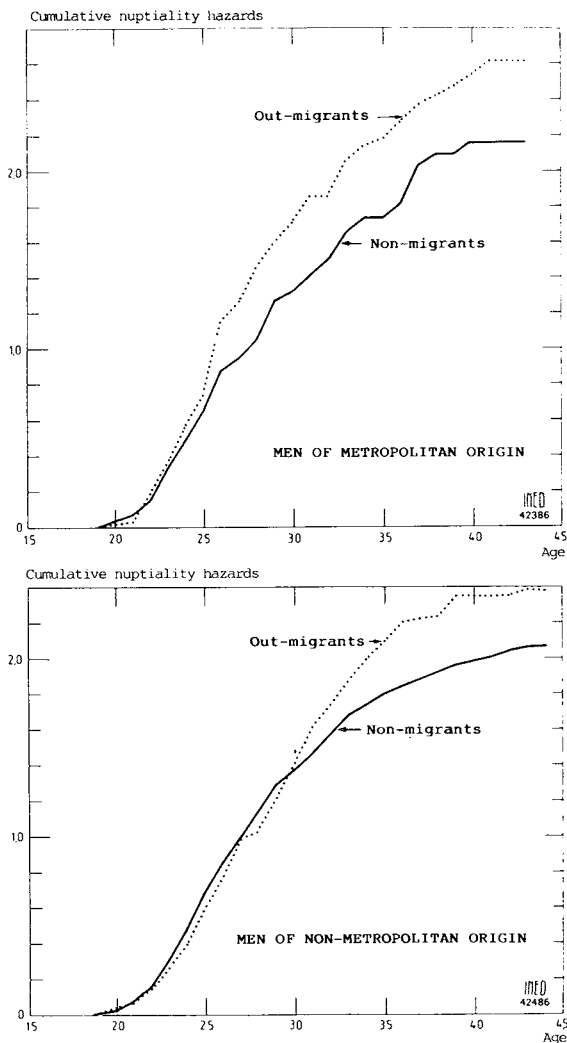


Figure 2. – Cumulative nuptiality hazards for migrant and non-migrant men according to their origin



metropolitan areas from their 25th birthday. In the first group, this behaviour may be linked with that of men working in the agricultural sector [6] who constitute a considerable proportion of men living in non-metropolitan areas. However, we may note that those migrating out of large towns do not follow the behaviour patterns of those working in agricultural occupations and that marriage rates among them are higher than in the original rural population.

We next consider how marriage influences the mobility of those who lived in non-metropolitan areas at their 14th birthday. In Figure 3 we show the cumulated mobility hazard by marital status of men and

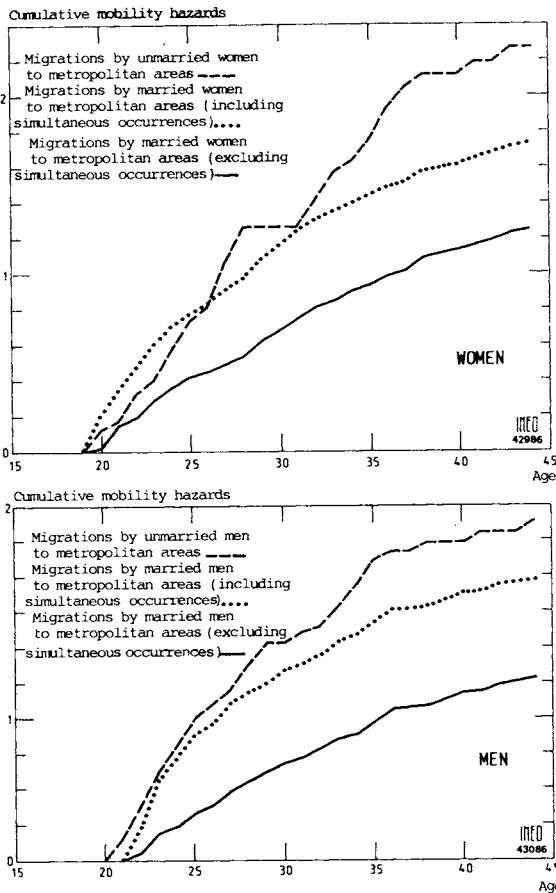


Figure 3. - Cumulative mobility hazards for migrations towards the metropolitan areas by men and women, with simultaneous occurrences either included or excluded

women. The behaviour of both sexes is the same, but it is accentuated amongst women : once married, their chance of moving to metropolitan areas is divided by a factor of two, compared with only 1.5 for men. This consolidates what we had already observed elsewhere [5] : we showed that whereas marriage delayed changes of residence, it hardly affected moves between "*départements*"; we shall now show that it greatly affects migration to the city. This strong dependence of mobility on marital status more than balances any effect of marriage on migration.

It must be noted that cases when marriage and migration occur simultaneously are rare : only 3.3 % of women of non-metropolitan origin (3.8 % of marriages but 23 % of moves to the city) and 1.9 % of men (2.1 % of marriages and 10.7 % of moves to the city). It is interesting to note how including these people among moves of married people to the city modifies the relative position of the married and unmarried. These results are shown in Figure 3. Cases of simultaneity relate mainly to young people under the age of 26, so that the two curves are at the same level before this age. This result confirms our observations on agricultural populations [6].

We have not taken into account results relating to those who migrated out of the metropolitan areas, because of the small numbers observed, and of the low rates of migration to less urbanized areas.

### *The effect of social and occupational characteristics*

to study the effect of various characteristics on an individual's behaviour.

To extend our analysis we must now turn to a semiparametric approach which will make it possible

In Table 1 we show an analysis of the nuptiality of men and women who lived in non-metropolitan areas at their 14th birthday, separating those who remained there from those who migrated. There are two distinct cohorts – those born between 1911-1925 and those born between 1926-1935. The results for the two sexes differ widely.

The educational level, measured by qualifications obtained, clearly plays an important role. Men's ability to find a wife increases with their educational level. Men in older cohorts found one more easily before moving to the big city <sup>(1)</sup>, but in the more recent cohorts men found a wife more easily after having moved. For women, however, academic qualifications delay marriage. In the older cohorts this delay was found both before and after migration, in more recent cohorts it was limited to the period before moving.

<sup>(1)</sup> Thus, for example the probability of marriage for a man who remained at school until the legal leaving age and obtained his primary school-leaving certificate (CEP) was multiplied by  $\exp(0.112) = 1.11$ , i.e. 11 % higher than for a man without the certificate.

The occupation of the individual surveyed and that of his or her father has an equally important effect.

The probability of marriage for farmers' sons was higher when they left this sector of the economy. This advantage was maintained after migration in cohorts born between 1911-25, but was lost in later cohorts. The effect of occupation before migration was greater in the first cohort than in the second – those working in the agricultural sector married later than manual or unskilled workers, who in turn married later than others. This confirms results of other studies ([12], p. 72). However, when migration occurs, this effect is entirely eliminated and occupation after migration does not seem to affect nuptiality.

Amongst farmers' daughters from the cohorts 1911-25, their father's occupation delayed their marriage even longer when they left the agricultural community and took up different employment. Migration to the city does not alter this effect. Women in more recent cohorts seem freer from family influence, since their marriages were not delayed when their father was engaged in agriculture. The part played by the first occupation was the same in both cohorts : non-working women married sooner than women who worked in agriculture, who in their turn married sooner than did skilled women workers, who married sooner than women in other occupations. Again, this result agrees with other studies on the subject ([12], p. 73). Migration to a large city in no way alters this situation for women, unlike in the case of men.

Amongst the different family characteristics which we have studied, the effect of being the eldest child differs at different times and between the sexes.

Being an eldest daughter does not affect the probability of marriage before migration to a large city. After such a move, the chance of marriage will be higher for the eldest daughters in cohorts born before 1925, whereas in later cohorts marriage will be delayed. On the other hand, being an eldest son does influence nuptiality before migration to a large city : for cohorts born before 1925, the effect is favourable, for those born later it is unfavourable. In earlier cohorts, migration cancels out the effect which is still found in later cohorts. A sociological survey on the status of the eldest child would be necessary to explain these apparently significant results.

The various characteristics considered here are not independent : educational level and occupation, for example, are closely linked. In Table 1, we have illustrated the effect of different characteristics – the educational level, father's occupation, the subject's first occupation and the fact of being an eldest child – taken simultaneously. It is clear, especially for women, that the effect of education and occupation on marriage, although related, is separate. This result confirms what had already been illustrated in previous family studies in which different

TABLE 1. — NUPTIALITY OF MEN AND WOMEN OF NON-METROPOLITAN ORIGIN, MODIFIED BY MIGRATION TO METROPOLITAN AREAS

Variables	Cohorts born between 1911-1925						Cohorts born between 1926-1935					
	Variables taken separately			Variables taken simultaneously			Variables taken separately			Variables taken simultaneously		
	$\beta_1$	$\beta_0$	$\beta_2$	$\beta_1$	$\beta_0$	$\beta_2$	$\beta_1$	$\beta_0$	$\beta_2$	$\beta_1$	$\beta_0$	$\beta_2$
	Men											
Migration to metropolitan area	0.112 **	0.115	- 0.160	0.085 *	0.271	- 0.163	0.126 **	0.133	0.283 *	0.049	0.079	0.461 **
Educational level	0.107 *	0.252	- 0.318 *	0.076		- 0.364 *	0.129 *	- 0.167	- 0.098	- 0.167 **		- 0.001
Eldes child	- 0.010	- 0.027	0.048			0.003	0.083	0.200	- 0.021			
No. of siblings	0.137	0.030	0.362			0.075	0.139	0.166	- 0.237			
Parents resident in met. area	- 0.163 *	0.086	0.346			0.075	0.139	0.166	- 0.072			
Foreign or naturalized	0.240 **	0.072	0.214			0.293 *	0.388 **	0.307 *	- 0.435 **			- 0.250
Father in agriculture	0.091 **	0.315 *	- 0.210 *	0.022		- 0.217	0.232 **	0.307 *	- 0.257 **	0.157 *		- 0.322 *
First socio-occupational group		0.699	- 0.673 **					0.059	0.088	0.170 **		
Tenant at the time of move		0.168	- 0.048					0.205	- 0.065			
Socio-occ. group on moving												
Maximum log-likelihood	- 5152.30	(father in agriculture)	- 5148.65	- 4115.44	(first socio-occ. group)	- 4109.09						
	Women											
Migration to metropolitan area	- 0.339 **	0.083	- 0.071	- 0.306 **	- 0.158	- 0.173	0.231 **	0.051	0.119	0.218 **	0.478 **	0.270
Educational level	0.043	0.263 *	0.263 **	0.094 *		0.777 **	0.021	0.023	- 0.512 **	0.043		- 0.500 *
Eldes child	0.017 *	0.097	0.051			0.005	0.005	0.221	0.071 *			
No. of siblings	- 0.031	0.017	- 0.582			- 0.063	0.063	0.055	0.199			
Parents resident in met. area	- 0.031	0.720 **	0.548 **			- 0.066	0.033	0.182	0.182			
Foreign or naturalized	- 0.118 **	0.051	0.186	- 0.017		- 0.310	0.069	0.196	- 0.230	0.155 **		- 0.188
Father in agriculture	- 0.107 **	0.136	0.034 *	- 0.059 **		0.105	0.071 **	0.267	- 0.133	0.050 *		- 0.147
First socio-occupational group		0.162	0.096					0.664	- 0.639			
Tenant at the time of move		0.006	- 0.078					- 0.045	0.082			
Socio-occ. group on moving												
Maximum log-likelihood	- 7616.56	(academic qualif's)	- 7608.56	- 4564.76	(academic qualif's)	- 4559.72						

\* Result significant at 10 % level.  
 \*\* Result significant at 5 % level.

$\beta_1$  = Principal effect;  $\beta_0$  = Modification;  $\beta_2$  = Interaction.

methods had been used [1] : for people with the same level of education, occupation has an effect, and for those in the same occupation, the level of education is significant.

In Table 2 we show the results of an analysis of the nuptiality of men and women who lived in metropolitan areas at their 14th birthday. Because of the small numbers involved, we were unable to distinguish between the two earlier cohorts, and thus our results are less clear. Nevertheless, the effect of the different characteristics is similar to that observed outside the metropolitan areas. Educational level and occupation still have opposite effects for men and women. On the other hand, none of the family characteristics has a significant effect on nuptiality.

Let us now consider the converse – the effect of marriage and other characteristics on migration to the metropolitan areas. In Table 3 we show the results of this analysis, and in this case the behaviour of men and women is similar. We will, therefore, consider them together.

Marriage clearly delays migration, and as the nonparametric analysis showed, this delay is greater for women than men.

Family origin, on the other hand, has the same effect for men and women. If the father worked in the agricultural sector, the chance of migration is higher, both for the single and the married. If an individual spent some years in a city during childhood, he or she is likely to return there as an adult, especially if he or she marries someone born in a city or who lived there before marriage. The city also appears attractive for those born abroad; Italians, who accounted for the highest proportion of foreign immigrants at the time, were particularly attracted by the urban "*départements*" nearest their homeland, i.e. near the Mediterranean coast.

The effect of an individual's position in the family differs for each sex. Eldest daughters seem to experience difficulties in moving to the city, but the effect of being the eldest is never really significant. However, the number of siblings born after the eldest daughter is significant and always works in the same direction : the larger the family, the greater the probability that she will migrate to a metropolitan area. This effect continues, although to a lesser extent, even after marriage. Being an eldest son is only significant in the first cohort, and increases the probability of migration to a city. However, once the eldest son has married, this effect no longer applies. The number of his sibs will have an effect especially after marriage, and the probability of migration will increase with the number of siblings.

Finally, we shall consider the influence of occupational status, which will depend on the educational level achieved and first occupation, and which has the same effect on both cohorts. The higher the educational level, the greater the attraction of the city, both before and after marriage. Furthermore, the spouse's educational level will have the same

TABLE 2. — NUPTIALITY OF MEN AND WOMEN OF METROPOLITAN ORIGIN, MODIFIED BY MIGRATION TO NON-METROPOLITAN AREAS; MIGRATION TO NON-METROPOLITAN AREAS MODIFIED BY MARRIAGE

Variables	Men						Women					
	Variables taken separately			Variables taken simultaneously			Variables taken separately			Variables taken simultaneously		
	$\beta_1$	$\beta_0$	$\beta_2$	$\beta_1$	$\beta_0$	$\beta_2$	$\beta_1$	$\beta_0$	$\beta_2$	$\beta_1$	$\beta_0$	$\beta_2$
Nuptiality modified by migration to non-metropolitan areas												
Migration to non-metropolitan area	0.023	0.400 **	0.039	- 0.040	- 0.131	0.036	- 0.340 **	0.085	- 0.342 **	0.179	- 0.055	- 0.055
Educational level	0.068	0.345 **	0.013	0.054		0.090	- 0.007	0.033	0.074		0.235	0.235
Eldest child	- 0.032	0.394 **	0.000				0.024	0.175				
No. of siblings	0.009	0.387 **	0.030				0.071	0.192				
Parents resident in met. area	- 0.528 **	0.401 **	- 0.138				0.257	0.076				
Foreign or naturalized	0.180	0.157	0.666 *	0.068		1.031 **	0.134	0.219	0.257 *		- 0.312	- 0.312
Father in agriculture	0.122 *	0.481 **	- 0.068	0.126		- 0.343 *	- 0.090 **	0.029	0.043		0.107	0.107
First socio-occupational group		0.443 **	- 0.050					- 0.218			- 0.107	- 0.107
Tenant at the time of move		0.187	0.202 *					0.142			- 0.107	- 0.107
Socio-occ. group on moving												
Maximum log-likelihood	- 1629.41	(foreign or naturalized)			- 1627.84		- 2179.50	(academic qualif. s)		- 2177.31		
Migration to non-metropolitan areas modified by marriage												
Variables												
Marriage	0.035	0.356	- 0.267	0.588 **	0.446	- 0.348	0.231 *	0.286 *	0.139	- 0.258 *	- 0.064	- 0.064
Educational level	0.466 **	0.182	0.030				0.204	- 0.286	0.001			
Eldest child	- 0.016	- 0.027	0.023	- 0.016			0.061	0.114	- 0.071	0.087 *	- 0.056	- 0.056
No. of siblings	- 0.567 **	0.145	- 0.179	- 0.507 *			- 0.151	- 0.213	0.056	- 0.715 **	0.078	0.078
Parents resident in met. area	0.093	0.041	- 0.636	0.083			0.452	0.219	1.153 *	0.411	- 1.035 *	- 1.035 *
Foreign or naturalized	- 0.180	- 0.173	0.242	- 0.382			- 0.230	0.855 **	0.642	0.042	0.503	0.503
Father in agriculture	0.005	0.320	- 0.239	- 0.171			0.001	0.601 *	0.157	0.060	- 0.009	- 0.009
First socio-occupational group		- 0.021	0.151					0.649 **	0.314 **		0.165	0.165
Spouse's education		0.050	0.081					- 0.263	0.273		0.518	0.518
Spouse born abroad		0.392 *	- 0.818 **					0.100	- 0.855 **		0.165	0.165
Spouse born in met. area		0.688 **	- 0.847 **					0.220	0.605 **		0.165	0.165
Spouse urban resident before mar.		0.384	- 0.218 **					- 0.558 **	0.200 *		0.165	0.165
Spouse's socio-occ. group		0.386	- 0.285 *					- 0.470 **	0.095		0.165	0.165
Socio-occ. group after marriage		- 0.432	0.577 *					- 0.856 **	0.739 **		0.165	0.165
Tenant or housed by empl. after mar.											0.165	0.165
Maximum log-likelihood	- 798.55	(parents resident in met. area)			- 791.89		- 829.92	(parents resident in met. area)		- 817.13		

\* Result significant at 10 % level.  
 \*\* Result significant at 5 % level.

$\beta_1$  = Principal effect;  $\beta_0$  = Modification;  $\beta_2$  = Interaction.

TABLE 3. — MIGRATION TO METROPOLITAN AREAS MODIFIED BY MARRIAGE

Variables	Cohorts born between 1911-1925						Cohorts born between 1926-1935					
	Variables taken separately			Variables taken simultaneously			Variables taken separately			Variables taken simultaneously		
	$\beta_1$	$\beta_0$	$\beta_2$	$\beta_1$	$\beta_0$	$\beta_2$	$\beta_1$	$\beta_0$	$\beta_2$	$\beta_1$	$\beta_0$	$\beta_2$
Men												
Marriage	0.708 **	-0.449 **	0.029	-1.977 **	0.500 **	0.027	0.369 **	-0.732 **	0.103	-0.274 **	-2.030 **	0.034
Educational level	0.347 **	-0.529 **	0.029	-	-	-	-0.891 **	-0.891 **	0.103	-	-	-
Elder child	-0.067 **	-0.289	-0.429*	-	-	-	0.073	-0.729 **	0.017	-	-	-
No. of siblings	(U)	(U)	(U)	-0.025	-	0.073	0.001	-1.125 **	0.106 **	0.027	-	0.108 **
Parents resident in met. area	-0.133	-0.638 **	1.486 **	0.089	0.089	1.507 **	1.769 **	-0.599 **	1.297 **	1.983 **	-	-1.796 **
Foreign or naturalized	0.573 **	1.292	0.938 **	0.001	0.001	0.955 **	0.326 *	-0.888 **	0.164	1.321 **	-	0.015
Father in agriculture	0.592 **	-0.769 **	0.222	0.370 **	0.370 **	0.002	0.352 **	-0.730 **	0.096	-0.200	-	0.767 **
First socio-occupational group	-	-	-	-	-	0.275 *	0.909 **	0.572 **	-	-	-	-0.128
Spouse's education	-	-	0.750 **	-	-	0.341	0.941 **	1.166 **	-	-	-	0.440 **
Spouse born abroad	-	-	1.031 **	-	-	1.217 **	-0.884 **	1.959 **	-	-	-	0.777 **
Spouse born in metropolitan area	-	-	1.443 **	-	-	-	-0.870 **	1.714 **	-	-	-	1.866 **
Spouse's socio-occ. group	-	-	0.213 **	-	-	-	-0.799 **	0.045	-	-	-	-
Spouse's socio-occ. group after marriage	-	-	0.490 **	-	-	-	-0.567 **	-0.167	-	-	-	-
Tenant or housed by employer after mar.	-	-	0.438 **	-	-	-	-0.709 **	-0.034	-	-	-	-
Maximum log-likelihood	-1137.54	-	(first socio-occ. group)	-1106.37	-975.94	(foreign or naturalized)	-931.84	-	-	-	-	-
Women												
Marriage	0.200 **	-1.000 **	0.404 **	-1.717 **	0.255 **	0.111	0.126	-0.999 **	0.271	0.175	-2.520 **	-0.153
Educational level	-0.190	-1.058 **	0.085	-	-	-	-0.248	-1.057 **	0.291	-	-	-
Elder child	0.065 **	-0.864 **	-0.046	-	-	-	0.065 **	-1.104 **	0.036	-	-	-
No. of siblings	1.158 **	1.009 **	0.085	0.075 **	1.168 **	0.016	0.661 **	1.003 **	-0.036	0.064 **	-	0.003
Parents resident in met. area	0.685 **	-1.344 **	0.305	0.624 **	0.624 **	0.002	0.265	1.256 **	1.359 **	0.682 **	-	0.257
Foreign or naturalized	0.505 **	1.423 **	0.622 **	0.468 **	0.468 **	0.332	0.140	-1.415 **	1.359 **	0.234	-	0.872 **
Father in agriculture	-0.012	-1.446 **	0.287 **	-0.100	-0.100	0.151	-0.061	-1.512 **	0.561 **	0.208	-	0.239
First socio-occupational group	-	-	1.384 **	-	-	0.183 *	1.516 **	0.564 **	0.308 **	-0.114	-	0.217 **
Spouse's education	-	-	0.464 **	-	-	0.679 **	-1.264 **	1.413 **	1.413 **	-	-	0.506 **
Spouse born abroad	-	-	0.838 **	-	-	1.550 **	-1.184 **	1.989 **	1.444 **	-	-	1.115 **
Spouse born in metropolitan area	-	-	1.759 **	-	-	-	-1.105 **	0.099	1.184 **	-	-	1.474 **
Spouse urban resident before mar.	-	-	1.894 **	-	-	-	-1.191 **	0.126	1.184 **	-	-	-
Spouse's socio-occ. group	-	-	0.034	-	-	-	-	-	0.099	-	-	-
Socio-occ. group after marriage	-	-	0.166 **	-	-	-	-	-	0.126	-	-	-
Tenant or housed by employer after mar.	-	-	0.764 **	-	-	-	-	-	0.253	-	-	-
Maximum log-likelihood	-1712.18	-	(academic qualif's)	-1646.99	-1075.47	(foreign or naturalized)	-1051.24	-	-	-	-	-

\* Result significant at 10% level.  
 \*\* Result significant at 5% level.  
 (U) After 10 iterations the estimation does not converge.

$\beta_1$  = Principal effect;  $\beta_0$  = Modification;  $\beta_2$  = Interaction.

effect. The effect of a man's first occupation is noticeable before marriage, whereas for women it begins to operate after marriage. Those working in agriculture are less attracted to the city than other manual or unskilled workers, who in turn migrate less than do members of other groups. After marriage, this effect is generally combined with the influence of the subject's new occupational group and that of his or her spouse.

The fact that we have considered the effect of different variables simultaneously does not affect the essence of our previous results. This approach accentuates the delaying effect of marriage and underlines the significant influence of the first stage in the family cycle on mobility towards the city : once married in a non-metropolitan area, individuals are much less likely to leave that area, whatever the couple's characteristics.

We shall look briefly at the modifying effect of marriage on migration out of the city. This is illustrated in Table 2, and we shall discuss only two significant results. First, the effect of educational level which, surprisingly, acts in the same way as it did on migration out of the non-metropolitan areas. Educational level, therefore, seems to be an important spur in both directions. Spouse's educational level, especially for women, works in the same way. On the other hand, those who lived in a metropolitan area during childhood, and those who married someone born in such an area, were less likely to leave the city, as might be expected.

## II. – Fertility and urbanization

We shall continue our study of the links between family formation and urban migration by considering only the females in our sample. In fact the behaviour of men is similar, although less marked. Again, we shall present the reciprocal effects of births and mobility, before discussing the effect of social and occupational characteristics on a specific event : the birth of the third child.

***Births and mobility*** In Figure 4 we show the cumulated fertility rates for different birth orders of women who lived in a non-metropolitan area at their 14th birthday, depending on whether they later migrated or not. In Figure 5 the rates for women from the cities are shown.

The contrast between the two series of curves is striking. For women from outside the metropolitan areas, migration to an urban area reduces their fertility after the birth of their second child by one-third. Conversely migration to a non-metropolitan area brings about a sharp



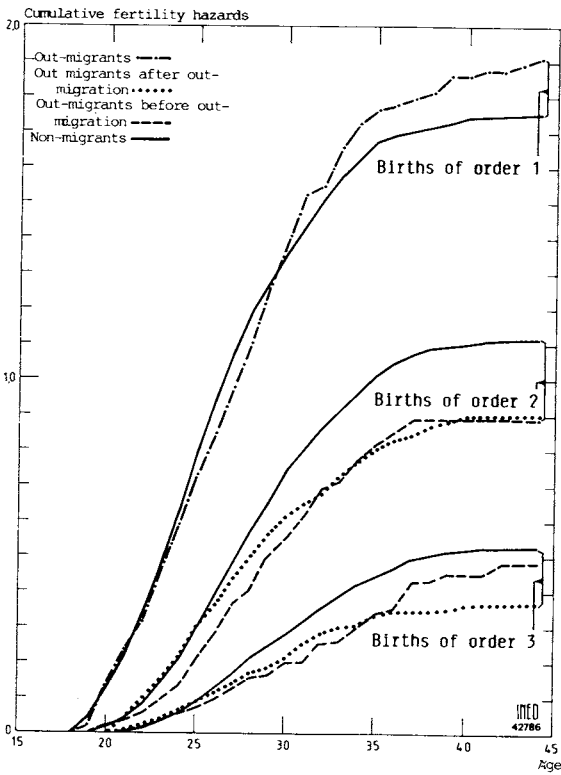


Figure 4. - Cumulative order-specific fertility hazards for women of non-metropolitan origin according to whether they migrated out or not

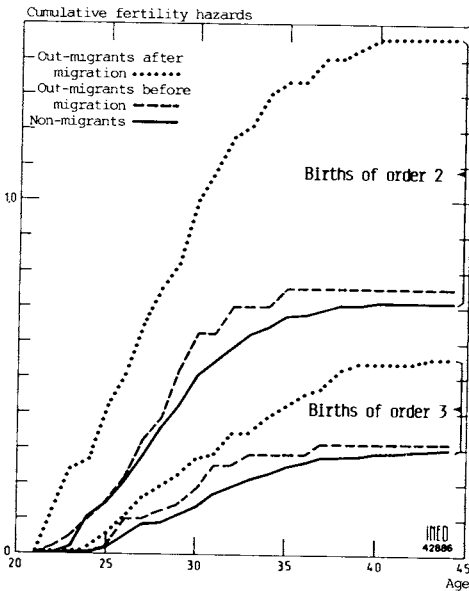


Figure 5. - Cumulative order-specific fertility hazards for women of metropolitan origin according to whether they migrated out or not

rise in fertility after the birth of their first child <sup>(2)</sup> for women from the cities. After migration, the hazard rates are 1.4 to 2 times higher than for those who remained. It seems likely that women adapt quickly to the fertility prevailing in their area of destination.

However, it is possible that the behaviour of women who ultimately migrate may have been different from that of women who stayed in their area of origin throughout their lives. This is why, in Figures 4 and 5, we have added the cumulated fertility hazard rates of these future migrants before they moved.

For migrations to metropolitan areas (414 women), the results in Figure 4 confirm the previous hypothesis : women (less than 35 years old at their third birth) who migrate to these areas timed their fertility before migration differently from that of women who remained in non-metropolitan areas. Moreover, their timing was the same as that of women who had already moved to these areas. However, the behaviour of women who had their third birth after the age of 35 was similar before migration for those who migrated and for those who did not. In such cases we are concerned with very late migrants.

Figure 5 shows a contrasting effect for the 144 women who moved to non-metropolitan areas : the fertility of women of urban origin who later migrated to less urbanized areas was not markedly different from that of those who remained in the city. In their case, fertility increased significantly only after migration.

Figure 6 gives the cumulated hazard rates for mobility to the city of women with no, one, or two, children depending on whether they moved before or after their  $n$ th child. In Figure 7 the same rates are shown for women who left the cities. Even though the latter group is small, the two graphs present a marked contrast.

Migration to the city, depending on the number of children already born or yet to come, follows the same pattern as that observed earlier for marriage. The mobility rates of individuals before a birth of order  $n$  are reduced to approximately two-thirds of their value thereafter. These results are very significant. The opposite pattern appears for migration in the reverse direction to a non-metropolitan area, though the effect is less significant because of the small numbers in the sample. Nonetheless, it may be concluded that the mobility rates of those living in the city are larger after a birth of order  $n$  than before, even though this increase is smaller than the reduction observed for moves in the opposite direction.

Thus whilst there seems to be a certain attachment to non-metropolitan areas, which increases with the number of children, there is also

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<sup>(2)</sup> In order to make this figure more legible we have not included the fertility hazard rates for first births. They yield a cumulated hazard at age 44 of 2.04 for women who migrated, and 1.43 for those who did not.

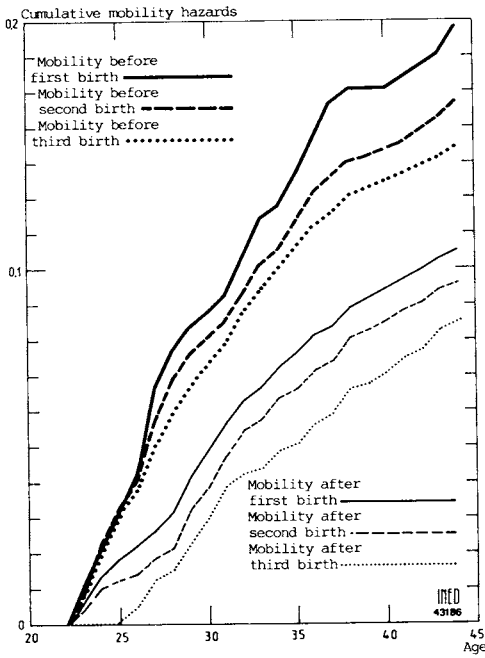


Figure 6. - Cumulative mobility hazards for migrations to metropolitan areas by women with zero, one or two children, according to whether they migrated out before or after the  $n^{\text{th}}$  birth (after age 22)

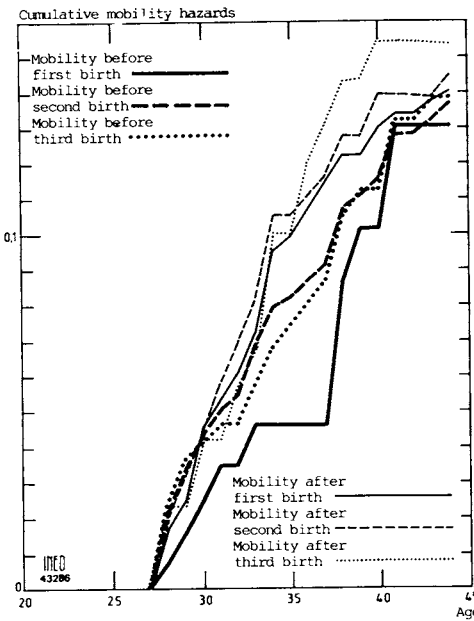


Figure 7. - Cumulative mobility hazards for migrations to non-metropolitan areas by women with zero, one or two children, according to whether they migrated out before or after the  $n^{\text{th}}$  birth (after age 27)

mobility out of metropolitan areas which likewise increases with the number of children.

***The effect of social  
and occupational characteristics***

We shall now consider in greater detail the interactions between mobility and the birth of the third

child, taking into account some of the individuals' other characteristics.

In Table 4 we show an analysis of two cohorts of women who came from a non-metropolitan area, and in Table 5 that for women from metropolitan areas. We believe that it is important to present these two tables together, because the effect of all variables other than migration and the possibility that their parents may have lived in the city during their childhood is completely independent of their origin.

When we consider the way in which the birth of the third child is affected by different characteristics, five important effects become apparent. Being the daughter of someone engaged in agriculture will have an effect, irrespective of whether the woman lived in a metropolitan area or not : before migration, this would delay the birth, but after having moved the effect will disappear. This is the only one of the five variables on which mobility has an effect. If a woman has a large number of sibs, she will be more likely to have a third child, irrespective of whether she comes from a rural or an urban background. A woman's educational level will also affect her fertility : women without any qualifications are the most likely to have a third child, followed by those with only the primary school-leaving certificate (CEP), and finally those with the baccalauréat or higher qualifications. Women with a technical or professional diploma are least likely to have a third child. The woman's first occupation will also have an effect which is independent of her origin. Women who have never worked are most likely to have a third child, followed by women in the farming sector, manual workers and women in the professions and senior management. Office workers and those employed in middle-management are least likely to have a third child. Finally, women born abroad and naturalized women are more likely to have a third child.

These characteristics, even if considered simultaneously (see Tables 4 and 5), will affect the chance of having a third child, and the effect of the last four of the characteristics mentioned will be independent of the woman's place of residence and whether she has moved or not. Only migration from one area to another introduces the significant difference shown in the nonparametric study, and which these characteristics do not permit us to explain : migration to the city induces a marked reduction in the chance of giving birth to a third child, whereas migration to less urbanized areas raises fertility.

TABLE 4. — BIRTH OF THE THIRD CHILD AMONGST WOMEN OF NON-METROPOLITAN ORIGIN, MODIFIED BY MIGRATION TO A METROPOLITAN AREA: MIGRATION TO THE METROPOLITAN AREAS MODIFIED BY THE BIRTH OF THE THIRD CHILD

Variables	Cohorts born between 1911-1925						Cohorts born between 1926-1935					
	Variables taken separately			Variables taken simultaneously			Variables taken separately			Variables taken simultaneously		
	$\beta_1$	$\beta_0$	$\beta_2$	$\beta_1$	$\beta_0$	$\beta_2$	$\beta_1$	$\beta_0$	$\beta_2$	$\beta_1$	$\beta_0$	$\beta_2$
Migration to metropolitan area												
Educational level	- 0.360 **	- 0.267 **	0.208	- 0.231 **	- 0.688 **	0.141	- 0.135 **	- 0.449 **	- 0.038	- 1.053 **	- 0.184	
Elderest child	- 0.079	- 0.363 **	0.545	-	-	-	- 0.088	- 0.351	-	-	-	
No. of siblings	0.085 **	- 0.483 **	- 0.041	0.058 **	-	-	0.057 **	- 0.478 **	0.044 **		0.014	
Parents resident in met. area	- 0.058	- 0.404 **	0.867 **	-	-	-	0.218	- 0.398 **	-	-	-	
Foreign or naturalized	0.293 **	- 0.265 **	0.154	-	-	-	0.138	- 0.412 **	-	-	-	
Father in agriculture	- 0.222 **	- 0.679 **	0.584 *	0.023	-	0.553 *	- 0.028	- 0.590 **	0.126	-	0.739 **	
First socio-occupational group	- 0.189 **	- 0.316 **	0.049	- 0.117 **	-	0.011	- 0.151 **	- 0.535 **	- 0.137 **	-	0.073	
Tenant at the time of move	-	- 0.361 **	0.109	-	-	-	-	- 0.734 **	-	-	-	
Socio-occ. group on moving	-	- 0.233	0.021	-	-	-	-	- 0.446 **	-	-	-	
Maximum log-likelihood	- 3622.12	(academic qualifications)	- 3608.64	- 2061.02	(first socio-occ. group)	- 2055.83						
Variables												
Birth of third child												
Educational level	0.226 **	- 0.213	0.518 **	0.254 **	0.017	0.429 **	0.114 *	- 0.387 *	0.101	- 1.052	0.303	
Elderest child	- 0.219 *	- 0.364 *	0.387	-	-	-	- 0.120	- 0.412	-	-	-	
No. of siblings	0.065 **	0.288	- 0.158 **	0.096 **	-	-	0.054 **	- 0.366	0.060 **	-	0.022	
Parents resident in met. area	1.206 **	- 0.212	0.029	1.183 **	-	-	0.757 **	- 0.373 *	0.742 **	-	0.213	
Foreign or naturalized	0.863 **	- 0.242	0.016	0.825 **	-	-	0.636	- 0.623 **	0.867 **	-	0.036	
Father in agriculture	0.734 **	- 0.727 **	0.743 **	0.574 **	-	0.459	0.355 **	- 0.342	0.335 **	-	0.005	
First socio-occupational group	0.099 **	- 0.555 **	0.237 **	-	-	-	0.077 **	- 0.647 *	-	-	-	
Spouse's education	-	- 0.357 *	0.176 *	-	-	1.496 **	-	- 0.460 *	0.077	-	-	
Spouse born abroad	-	- 0.383 **	1.200 **	-	-	-	-	- 0.874 **	1.951 **	-	1.645 **	
Spouse born in metropolitan area	-	- 0.254 **	0.768	-	-	-	-	- 0.419 **	0.854	-	-	
Spouse urban resident before mar.	-	- 0.357 **	2.022 **	-	-	-	-	- 0.420 *	1.551 *	-	-	
Spouse's socio-occ. group	-	- 0.303	0.097	-	-	-	-	- 1.063 **	0.489 **	-	-	
Socio-occ. group after third birth	-	- 0.730 **	0.325 **	-	-	-	-	- 0.730 **	0.205 *	-	-	
Tenant or housed by employer after 3rd birth	-	- 0.769 **	0.758 **	-	-	-	-	- 1.424 **	1.290 **	-	-	
Maximum log-likelihood	- 1720.76	(father working in agriculture)	- 1677.13	- 1091.15	(foreign or naturalized)	- 1080.13						

\* Result significant at 10% level.  
 \*\* Result significant at 5% level.

$\beta_1$  = Principal effect;  $\beta_0$  = Modification;  $\beta_2$  = Interaction.

TABLE 5. — BIRTH OF THE THIRD CHILD AMONGST WOMEN OF METROPOLITAN ORIGIN, MODIFIED BY MIGRATION TO A NON-METROPOLITAN AREA; MIGRATION TO THE NON-METROPOLITAN AREAS MODIFIED BY THE BIRTH OF THE THIRD CHILD

Variables	Variables taken separately			Variables taken simultaneously		
	$\beta_1$	$\beta_0$	$\beta_2$	$\beta_1$	$\beta_0$	$\beta_1$
	Birth of the third child modified by migration to a non-metropolitan area					
Migration to non-met. area		0.569 **			0.254	
Educational level	- 0.345 **	0.546 **	0.097	- 0.171 *		- 0.021
Eldest child	- 0.173	0.554	0.049	—		—
No. of siblings	0.119 **	0.646 **	- 0.031	0.075 **		- 0.014
Parents resident in met. area	0.163	0.542 **	- 0.033	—		—
Foreign or naturalized	0.597 **	0.563 **	- 0.077			
Father in agriculture	- 0.500 **	0.394	0.201	- 0.228		0.209
First socio-occupational group	- 0.209 **	0.363	0.097	- 0.113 *		0.110
Tenant at the time of move		0.540 **	0.044			—
Socio-occ. group on moving		0.432 **	0.061			—
Maximum log-likelihood	- 826.48	(academic qualifications)			- 821.98	
	Migration to non-metropolitan areas modified by birth of the third child					
Birth of third child		0.145			- 0.110	
Educational level	0.216 **	0.328	- 0.117	0.253 **		- 0.250
Eldest child	0.158	0.004	0.343			
No. of siblings	0.038	0.563 *	- 0.146 *	0.069 **		- 0.188 **
Parents resident in met. area	- 0.870 **	- 0.215	0.623	- 0.890 **		0.533
Foreign or naturalized	- 0.168	0.157	- 0.014	- 0.246		0.402
Father in agriculture	- 0.008	- 0.399	0.626	0.182		0.535
First socio-occupational group	0.036	- 0.389	0.261			
Spouse's education		- 0.198	0.314			
Spouse born abroad		0.159	- 0.125			0.611
Spouse born in metropolitan area		0.492 *	- 0.656 *			
Spouse urban resident before mar.		0.955 *	- 0.905 *			
Spouse's socio-occ. group		0.205	- 0.053			
Socio-occ. group after third birth		0.248	- 0.060			
Tenant or housed by employer after 3rd birth		- 0.492	0.803 *			
Maximum log-likelihood	- 880.20	(parents resident in met. area)			- 823.06	
* Result significant at 10 % level. ** Result significant at 5 % level.						
$\beta_1$ = Principal effect; $\beta_0$ = Modification; $\beta_2$ = Interaction.						

We proceed to consider the effects of the birth of a third child on mobility.

The influence of a woman's family origins will be different for women of different origins. Daughters of men engaged in agriculture of non-metropolitan origin will be attracted to the city, whereas women of

metropolitan origin will not be affected. Likewise, if a woman lived in the city as a child, the city will be more attractive if she lived in a non-metropolitan area at her 14th birthday, and she will be less willing to leave the city if she was living there at that stage of her life. This unwillingness is also found amongst women whose husbands were born in the city or who lived there before marriage. A woman of foreign origin or one with a foreign-born husband will also be attracted to metropolitan areas.

Migration in either direction is more likely the larger the number of sibs, but this effect disappears after the birth of the third child. An increase in educational level raises the likelihood of migration in either direction.

All these results largely confirm our observations of the interactions between nuptiality and mobility. They explain the effect of the third birth on mobility, which was shown in the nonparametric analysis. Tables 4 and 5 illustrate this effect when the different significant variables are taken into account simultaneously.

## Conclusions

We believe that we have clarified the effect of urbanization on the formation of a family, and, conversely, how the foundation of a family nucleus modifies the migration behaviour of the couple, both towards and away from the metropolitan areas. These interactions have rarely been taken into account, but our analysis underlines their importance and illustrates how the two phenomena influence each other.

The most important effect of nuptiality is to reduce migration to the city, whereas it hardly affects migration in the opposite direction. Its effect remains the same once the different characteristics that influence migration are taken into account, i.e. father's occupation, family environment, first occupation, etc.

Although migrants to the city are mostly single, or marry and migrate simultaneously, this mobility exerts little influence on their nuptiality. It delays marriage for women (a delay that is made up later), yet increases nuptiality slightly amongst migrant men, especially those who are older. Numerous characteristics have the opposite effect depending on sex. Thus men's nuptiality increases with educational level, whereas for women the opposite is true. The same is true of the individual's first occupation and the father's occupation.

When successive births are observed, the most striking effect is directly opposite to that observed for marriage. Migration to the city significantly reduces a woman's fertility, whereas migration to a less

urbanized area increases it. This represents a very swift adaptation to the behaviour of the area of destination. Whereas migration to a geographically central urban area attracts women whose fertility before migration was already similar to that prevailing in the urban area, migration to a less urbanized area attracts women whose fertility before migration was similar to that of other women in the urban area. They adopt the behaviour of the women in the non-metropolitan area once they have arrived there. Although the characteristics which we have considered all influence fertility, they do not explain the reason for such an adaptation. We must, therefore, look to other variables, such as the size and cost of the home, to explain this phenomenon.

The birth of successive children will also influence women's mobility, though to a lesser extent. The probability of moving to a metropolitan area is reduced after marriage and after each successive birth, but that of moving in the opposite direction is increased slightly by these events. The effect of the different explanatory variables is very like that observed after marriage, and it therefore seems that marriage introduces a far greater discontinuity in migration behaviour than successive births.

We must thus look for different directions in which to pursue this research and extend its results.

First, since all the changes in an individual's working life were recorded in the "*Triple biographie*" survey, we could extend the analysis by studying the link between fertility and occupational mobility, taking account of migration between urban and less urbanized areas, but the small numbers in the sample could lead to non-significant results. Furthermore, we have noted earlier that other elements which probably affected behaviour, such as the size and cost of the home, were not recorded in the survey.

It would, therefore, seem preferable to adopt a sociological or ethnological approach, and study a small number of individuals who moved to or from a metropolitan area. A detailed study of such individual cases should raise pertinent questions which would help formulate another survey and thus extend our research. This seems to be the most promising path to follow.

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