From the First to the Second Demographic Transition: An Interpretation of the Spatial Continuity of Demographic Innovation in France, Belgium and Switzerland.

R. LESTHAEGHE AND K. NEELS
Interface Demography, Vrije Universiteit Brussel, Pleinlaan 2, B-1050 Brussels, Belgium.

Abstract. This article links spatial indicators of two demographic innovation waves to historical and contemporary covariates of both a socio-economic and a cultural nature. The two waves of innovation correspond respectively to the so called "first" and "second" demographic transitions (FDT, SDT). A connection is made between the emergence of spatial demographic patterns and A.J. Coale's three preconditions for innovation, i.e. "readiness", "willingness" and "ability" (RWA-model) and to the influence of networks in shaping relatively stable regional subcultures. Since the RWA-model is of the "bottleneck" type, it is expected that the slowest moving or most resistant condition will largely determine the spatial outcome of the two demographic transitions. In the instances of French départements, Belgian arrondissements and Swiss cantons clear statistical associations emerge between indicators of both FDT and SDT and cultural indicators. This suggests that the "willingness" condition, as reflected in regional subcultures, has been the dominant bottleneck in both waves of demographic innovation. The Swiss evidence is, however, weaker than that for France and Belgium despite the fact that, here too, associations are in the expected direction.

Résumé. (to be checked & rewritten by native French speaker svp)
Cet article met en évidence une corrélation spatiale entre plusieurs indicateurs des deux vagues d'innovation démographique d'une part et une série d'indicateurs du type socio-économique et culturel d'autre part. Les deux vagues d'innovation correspondent à la première (FDT) et la deuxième transition démographique (SDT). En outre, le modèle RWA proposé par A.J. Coale (R = « ready », W = « Willing », A = « able ») implique l'existence d'un « goulet d'étrenglement » produit par la condition la plus inerte des trois. Dans le cas des départements français, des arrondissements belges et des cantons suisses, il s'avère qu'il y a une nette correspondence entre les cartes FDT et SDT et les cartes d'indicateurs culturels mesurés pendant deux siècles. Ceci suggère que, aussi pendant la deuxième transition démographique, le rôle des cultures régionales stables a été prépondérant. Ceci impliquerait que la condition W (ou « willingness ») a été la plus inerte une fois de plus. Cependant, les correspondances spatiales en Belgique et en France sont plus stables qu'en Suisse, ou la cohabitation prénuptiale actuelle se conforme moins à l'expérience démographique lors de la première transition.

1. The questions

Much of the debate on the topic of the second demographic transition concentrates on the issue whether there are two sufficiently distinct development phases worthy of a separate numbering, or whether the second one is merely a further unfolding of the first (e.g. Cliquet, 1992). Also in the original article that used the notion of a second transition (Lesthaeghe and van de Kaa, 1986), there were doubts, and the article title "Two demographic transitions?" contained a question mark. The authors noted that there was no clear cesure in time between the two transitions, and writing in the middle of the 1980s, they worried about the distinction between period-induced effects and longer term pattern development (ibidem:15). The latter worry can now be abandoned: the demographic developments of the early 1980s in Western Europe were not just a response to the 1976-86 economic depression, but they continued their progression throughout the 1990s as well.

Yet, the question regarding the degree of distinctness of the two transitions remains a salient one. In the second section of this paper we shall elaborate this issue by drawing up a checklist of contrasting trends in nuptiality and fertility, and by linking these to the underlying societal changes, both of a structural and of a cultural nature.

However, when inspecting the historical records of various Western European populations, one cannot but be struck by a number of spatial continuities. As we have shown for Belgium, for instance, the innovating regions with respect to the first transition also proved to be innovating areas with respect to the second (Lesthaeghe and Neels, 2000). In this paper we shall examine to what extent this also holds for Switzerland, another multilingual country, and for France which had a much earlier and completely different first demographic transition. To this we should add cases in which older patterns have been restored. In Austria, for instance, there has been such a "revenge of history", with the current maps of cohabitation and out-of-wedlock fertility replicating the maps as they existed near the end of the 19th Century (cf. Kytir, 1993). Hence, after an initial decline in illegitimacy for a period of about 60 years, the original spatial pattern was restored during Austria's second demographic transition. A similar pattern of restoration is also in evidence in Sweden and Norway, where cohabitation during the 1960s spread again from the northern areas to which the custom had been pushed back roughly half a century earlier (see the I_h-values of out-of-wedlock fertility in Coale and Treadway, 1986).

Such historical continuities could be taken as an indication of the fact that the second demographic transition is merely the progression of the first. Alternatively, it could equally be that two successive but distinct innovations (like that of the automobile and of the electronic chip) emerge from (i) a common and more general model, and (ii) diffuse according to similar principles. Hence, we are now facing two more questions: (i) is there a more general model of innovation that is also applicable to demographic phenomena, and (ii) is there a spatial pattern of diffusion that can be linked to it? In this paper we shall argue that the answer is positive to both questions, and illustrate with three examples that historical spatial continuity is possible across two waves of innovation.

2. The basic model of innovation

A well-known model in demography that supersedes the many distinct and more detailed narratives – and which is applicable to non-demographic innovations as well – is grounded in A.J. Coale's specification of three preconditions for new forms of behaviour to develop (Coale, 1973). Firstly, any new form of behaviour must yield benefits that outweigh the costs or disadvantages (= "readiness" or R). Secondly, the new form must be legitimised, i.e. it must be culturally (ethically, morally) acceptable (= "willingness" or W). Thirdly, there must be adequate means, though not necessarily of a technical nature, to implement the new form (= "ability" or A). Moreover, the three preconditions must be met jointly for the new behavioural form to succeed. Hence, a success S can be expressed as $S = R \cap W \cap A$. This expression furthermore defines a bottleneck-model, since the failure of satisfying one condition prevents the innovation from breaking through, even if the other two preconditions are met (cf. Lesthaeghe and Vanderhoeft, 1999).

This RWA-model can be specified at the micro level as well. Any individual or household i would have its own set of scores for R_i, W_i and A_i respectively. These scores range in intensity from zero (no perceived advantages at all, morally repugnant, no means of implementation) to unity (highly advantageous, culturally completely acceptable, perfectly implementable). The half-way score then corresponds to the point of indecision. The bottleneck condition furthermore stipulates that a change in behaviour for any actor, i.e. S_i depends on the *lowest* of his/her three scores crossing the half-way zone of indecision. Hence, S_i depends on minimum (R_i, W_i, A_i) becoming larger than 0.5.

The collections of individual scores R_i, W_i and A_i obviously form three distributions, i.e. R, W and A, but there is also the MIN-distribution which is made up of all the individuals' lowest scores of the three. This MIN-distribution will of course depend on the location and the shapes of R, W and A, but its mean will always be lower than the means of R, W and A (cf. Lesthaeghe and Vanderhoeft, 1999, for numerical examples). During a process of change, all four distributions move from the low end to the high end of the 0-1 intensity range. R, W and A can follow their own pace, and as they shift, also their variances will vary. At the onset and at the end, variances will be small since the bulk of the population has either not yet considered any new behavioural form (scores close to zero) or has already made the transition (scores close to unity). In the middle, variances tend to expand and distributions are likely to adopt a bell-shape.[1] The MIN-distribution is the slowest to move, but it too is likely to adopt a bell-shape in the process. If this is so by the time the upper tail of the MIN-distribution starts crossing the half-way point of indecision, then the new form of behaviour will grow in the population according to Verhulst's logistic curve. Many innovations and their diffusion, from gothic cathedrals to rumours, follow such a logistic growth. Furthermore, the logistic curves for older innovations tend to taper off and reach a saturation point when newer and better innovations are beginning to emerge. Also, the latest innovation can entirely wipe out the older pattern, and in this case, there is a new transition. And, if such transitions succeed each other, there is no problem with numbering them as a simple means of identification.

So far, we have treated the shifts in the distributions of R, W and A to be independent. This is not likely to hold. Economists, for instance, would commonly argue that R is the leading condition and that W and A would follow. In other words, if a new feature is highly advantageous, then moral barriers to it would be reduced and the search for appropriate means would be stimulated. There are, however, other examples with different sequences: breakthroughs in genetics and reproductive technology have opened up the means for new interventions, and in this case A is the leading condition. Similarly, some cultures or religions may have no objections to a particular new form of behaviour (e.g. Japan or Korea with respect to induced abortion), but if there is little to be gained from it, it could be the R-condition that is trailing the others. Hence, the case with R being the leading condition and with a cultural and technological lag may be frequently encountered, but it is by no means the only possibility.

If the RWA-model operates at the individual level, then various processes of diffusion can be linked to it (cf. Marsden, 1998; Montgomery and

Casterline, 1996; Kohler, 2001). If we stick to a simple model, each of the individual or household scores for the three conditions respectively can be written as a function of two different sorts of impact: (i) the effect of the actor's own characteristics, and (ii) the effect of network influences. In the latter part, each individual in the network can be given a "credibility weight" according to that individual's characteristics and position in the network. The sum of these for the network as a whole can be given an overall weight depending upon the actor's self-reliance and network reliance respectively. In more private or intimate matters, actors tend to give a greater weight to those members of their network that are closest to them, such as kin or friends. Hence, such opinions and, probably even more so, close examples of new behaviour may exert a strong influence. This is of course dependent on the degree of leeway that individuals have, and hence on the degree of social control versus the degree of individual autonomy. From these principles one can derive a hierarchical model of diffusion based on the model of contagion. This diffusion would be applicable to all three preconditions R, W and A without implying, though, that the three distributions would move simultaneously. For instance, knowledge about family planning technology can spread much faster (= ability) than willingness and readiness to adopt contraception.

For each of the three diffusion patterns with respect to R, W and A, we should expect there to be at least one locus of initial innovation from which the diffusion occurs until it meets social barriers. These barriers can be social class distinctions, cultural obstacles (e.g. religions barriers) or communication barriers (e.g. linguistic borders). From that point onward socio-economic, cultural and spatial variables observable at the macro level (e.g. for spatial units) should interfere in shaping the exact nature of diffusion (cf. Bocquet-Appel, 1996).

In actual research we seldom have information on the parameters used in the model above. As in the examples that will follow, we often only have empirical data for social groups or geographical aggregates that allow us to follow the diffusion on a plane and to link that to a set of covariates. If the information is only available for aggregates we shall run into the problem of ecological correlation. There are in fact two distinct aspects connected to this issue. Firstly, ecological correlations are higher than those existing at the individual level as a consequence of neglecting individual variance. Secondly, they may yield wrong interpretations. For instance, a negative correlation between the proportion of coalminers in a region and regional fertility levels does not imply that the coalminers themselves had lower fertility. But it could mean that coalmining regions were also highly

industrialised in other branches as well, and that a large working class population with higher incomes than in the agricultural sector was more prone to initiate fertility control. Hence, lower fertility would be associated with industrialisation and wage differentials more generally and not with coalmining in particular. The first, statistical aspect is less worrying because the correlation coefficients for a given set of ecological observations can still be compared among themselves. It is especially the second aspect that warrants attention. In this case, the use of multiple indicators, describing a smaller set of dimensions, may be helpful in avoiding the trap of giving specific indicators a too narrow and misleading interpretation.

To sum up: at present we have a model of innovation based on Coale's three necessary preconditions and capable of producing a logistic growth curve of any new behavioural form. Each of the three preconditions is being linked to a mechanism of social or spatial diffusion of the "contagion"-type, in which individual contact with networks is essential. Then social class and/or geographical patterns emerge in which innovating groups or regions lead the way, and in which the others follow depending on the strength of various types of barriers. Such barriers can exist with respect to any of the preconditions, but since the innovation model is of the bottleneck type, it suffices for only one precondition to be obstructed for the diffusion to be delayed across this barrier. This has a very important consequence: *spatial diffusion of a new form of behaviour will essentially be shaped by the spatial patterning of the bottleneck condition*, since it is this factor that contributes most to the location and shape of the MIN-distribution. Finally, new innovations corresponding to new opportunities commonly replace older ones according to the same principles, and *if the locus of innovation and the barriers remain similar, there should be historical, social or spatial continuity from one innovation wave to the next.*

3. From the first (FDT) to the second demographic transition (SDT)

In this section we shall contrast the demographic trends that were typical for the first and second demographic transitions respectively, and furthermore link these to societal developments that supported them. In doing so, we have essentially Western European societies in mind. Also, the checklist of table 1 gives a summary of the points that will be discussed.

3.1. OPPOSITE NUPTIALITY REGIMES

A first major contrast between the first and second demographic transition is the opposite evolution in nuptiality. During the FDT the Malthusian marriage pattern weakens, mainly as a consequence of the growth of wage earning labour.[2] This trend continues all the way till the early 1960s, and it was only interrupted during periods of crises (wars, 1930s depression). Hence, the lowest mean ages at marriage in Western European history – probably since the Renaissance - were encountered during the 1960s when the large gap with Eastern Europe had nearly been closed. During the SDT, ages at first marriage rose again and quite quickly so. This resulted not only from the insertion of an interim phase characterised by premarital cohabitation but also by later home leaving and more single living as well (cf. Lesthaeghe and Moors, 2000). Moreover, the pockets in Western Europe where premarital cohabitation and procreation outside wedlock had persisted during the 19th century were under siege during the FDT. Both Church and State considered these customs as immoral and not in line with ordered and well-behaved family life. Roughly from the end of the 19th century onward, illegitimacy declines in these areas, and this trend speeds up during the 20th. In many cases, but not all, these earlier pockets of high cohabitation and/or illegitimacy had completely disappeared by the 1950s.

The SDT, then, is characterised by exactly the opposite trend, and the new rise in both cohabitation and out-of-wedlock fertility constitutes a "revenge of history" in a double sense. Firstly, these practices have largely been restored in many areas where they had survived during the 19th century, and secondly, they tend to spread from such areas to others that had no such historical precedents. Moreover, the new interim phases between home leaving and marriage is strongly supported by new societal developments as well, such as a second secularisation wave, the rise of "post-materialist" values and the increase in female economic autonomy. In short, the FDT and the SDT are characterised by *opposite* trends in mean ages at marriage, cohabitation and illegitimacy.

The next contrast within the nuptiality system pertains to divorce and remarriage. During the FDT, divorce legislation remains very strict and there is little opposition to religious doctrine in this respect. Divorce on the basis of mutual consent is rare (except in the US) and mostly based on proven adultery. Those who still separate, but lack the means to pay for lengthy legal proceedings, are forced to opt for cohabitation with a new partner, although they remain legally married to the previous one. Strictly speaking, this form of partnership was not post-marital cohabitation, since

the initial marriage has not been dissolved, but a stable form of concubinage. The SDT witnesses the end to this long period of low divorce rates. The principle of a life-long legal partnership is fundamentally questioned. This takes the form of a rational evaluation of advantages and disadvantages for partners and children (e.g. "isn't a good divorce better for all than the maintenance of a bad marriage?"), and by attacking the hypocrisy of restrictive divorce legislation that fostered concubinage instead. The outcome in Western European countries is a succession of legal adaptations and simplifications, often starting in the 1950s and 1960s, that typically follow the rising demographic trend. In fact, the earliest indicator for the shift to the SDT is probably the rising divorce rate since the evaluation of the quality of a partnership in rational-economic terms (advantages versus disadvantages) is an early accentuation of individual autonomy in opposing the powers of Church and State.

Finally, FDT and SDT have also opposite patterns of remarriage. During the FDT, remarriages were essentially occurring among widowed partners, and remarriages among divorcees often meant a completely new start, with the birth of "new children for the new life-long marriage". In other words, even if divorce occurred, the institution of marriage would still be under minimal threat. Within the framework of the SDT, by contrast, remarriages among both widowed persons or divorcees decline, often in favour of post-marital cohabitation. This may not only have income tax advantages, but it leaves the longer term options open to the members of such reconstituted families, and it does not affect the inheritance rights of the respective sets of children either. Furthermore, not only post-marital cohabitation but also LAT-relationships or trusted friendships have come to replace remarriage as well. All of these are connected to the desire of keeping an "*open future*" without loss of social capital.

3.2. FERTILITY CONTRASTS

The next set of contrasts deals with the specifics of the fertility pattern. During the FDT fertility becomes increasingly confined to marriage, contraception affects fertility mostly at higher ages and marriage durations, mean ages at parenthood decline, and among married couples definitive childlessness is low. However, there are examples of below replacement fertility during the FDT, but such periods correspond with military or economic crises. The FDT furthermore ends with a baby boom, although much of that was merely an earlier marriage effect in several Western European countries. Nevertheless, the baby boom was at least indicative of

the fact that the FDT-ideal was still two or three children per couple. Another salient characteristic of the FDT was largely imperfect contraception. Until the early 1960s coitus interruptus was largely the method for the working classes and rhythm for the better educated or more religious couples. This meant that contraceptive failures led to unexpected pregnancies, and these were probably frequent enough to keep fertility levels above replacement. Particularly parity failures at higher ages, rather than timing failures, became increasingly undesirable during the later decades of the FDT.

The SDT starts with a triple revolution in the West: a *sexual* one, a *contraceptive* one and a *political* one. The sexual revolution was a forceful reaction to the double notion that sex is confined to marriage and that it is connected to procreation. It was furthermore an equally forceful rebellion of the youngest generation against the sexual mores of the older generations who were once more being accused of being "hypocritical" and "having double standards". This cleavage between generations was furthermore amplified to a full-fledged political rebellion against all forms of authority by the end of the 1960s. Parents, teachers, church, the army, and the political system *in toto* ended up in the dock. The contraceptive revolution, as indicated above, has older roots, and evidently stemmed from the long quest to avoid mainly parity failures. However, the new pressure on science to deliver efficient contraception was linked to the growing desire of women in particular to free themselves from the "fatalities of nature". This pressing wish for "biological autonomy" was even more strongly articulated by the subsequent quests for the legalisation of abortion. And judging from the radical feminist literature of the time, all "patriarchs", encompassing the entirety of the male gender, would end up in the dock as well.

With respect to the fertility pattern, many western countries had a bout of "shotgun marriages" during the late 1960s and early 1970s. Sex was learned faster than efficient contraception, and the reticence against the pill still lasted for a while. But then, the new technical factor opened up opportunities for new aspirations to be fulfilled prior to parenthood. The outcome has been fertility postponement, and this feature became the hallmark of the SDT. During the 1980s postponement of parenthood was spreading rapidly in southern Europe as well, and during the 1990s it pushed fertility down to record low levels in central Europe too. At present, fertility postponement has lead to the almost complete generalisation of below-replacement fertility in Europe. In western or southern countries with current period levels of total fertility below 1.5, the catching up of fertility at older ages (i.e. after age 30) has remained too weak for prospective cohort

fertility levels to come anywhere in the neighbourhood of the replacement level again (cf. Freijka and Calot, 2001; Lesthaeghe and Moors, 2000; Lesthaeghe, 2001). The result is that the SDT now has an extra characteristic: *long term subreplacement fertility*. And this may lead to the continuity of yet another trait: increased reliance on international migration and the further growth of the ethnic population components in European societies.[3]

3.3. STRUCTURAL AND CULTURAL CONTRASTS

As summarised in table 1, the FDT and SDT respectively had their roots in two distinct historical periods of societal development. With the exception of the very early fertility transition in France and a few other smaller areas in Europe, much of the FDT is an integral part of a development phase in which economic growth fosters material aspirations and improvements in material living conditions. The preoccupation of the period 1860-1960 were focussing on increasing household income, improving working and housing conditions, raising standards of health and prolonging life expectancy, improving the human capital of new generations via investment in education, and on providing a safety net for all via the construction of a social security system. Moreover, already in the 19th Century the state was taking over important tasks and institutions from the church such as poor relief, schools and hospitals. The rising prominence and power of the state often clashed with the older religious interests (e.g. the school wars) and this produced political-religious pillarisation in many western European countries. This system was characterised by the competition of various political factions (i.e. pillars) in providing these basic needs in exchange for political loyalty. Solidarity was a main value, particularly within each of the pillars. All of them also had views on the development of the family. For the religious pillars these views were based on the holiness of matrimony in the first place, but their defence of the family also stemmed from fears that the industrial society would lead to the breakdown of this holy bond, to immorality and social pathology, and to further secularism. The secular pillars (e.g. Liberal, Socialist) equally saw the family as the first line of defence against the ills of the 19th Century proletarisation (e.g. alcoholism, poverty, crime) and furthermore as the foundation for their building of a "brave, new world". Hence, for *all* pillars the family became the cornerstone of society. Both material and moral uplifting would furthermore be served best by a gender-based division of work within the family: the husband assumes his responsibilities as a devoted breadwinner, whereas the wife becomes the caretaker of all quality related aspects of the

family's wellbeing.[4] For this to be realised, the breadwinners' incomes needed to be high enough for the wives to remain at home, and hitherto this had only been the prerogative of the bourgeoisie. Hence, all pillars contributed to the embourgeoisement of the working class.

In short, for all social classes there should be a single family model and that should be served by ordered life course transitions: no marriage without solid financial base and no children outside wedlock. Not surprisingly, out-of-wedlock fertility declined dramatically in most areas where it had remained high prior to 1900. The Malthusian preconditions of "prudent marriage" were reactualised and adapted to the social aspirations of the industrial society.

The SDT, on the other hand, is grounded in the rise of the "higher order needs" as, for instance, defined by Maslow (1954). Once the basic material preoccupations, and especially that of long term financial security, are satisfied through welfare state provisions, other more existential and expressive needs arise. The most fundamental hallmark of all is the accentuation of individual autonomy and self-actualisation. These features emerge in a variety of domains:

(i)   In the political sphere such "post-materialist" needs deal, *inter alia*, with the quest for direct political control and grassroots democracy, the primacy of individual rights, the rejection of political patronage, the decline of life-long loyalty to a political pillar (i.e. "depillarisation") and the rise of ecological and other quality-related issues on the political agenda. The downside of it is rising distrust in political institutions and rising political anomie that can feed right wing extremism. The state is no longer the benign provider, but a potential Orwellian "big brother" again.

(ii)   A corollary thereof is the disengagement from civic and community oriented social networks (e.g. Putnam, 2000), which in Western Europe, were often related to the political or religious pillars. But also other networks such as professional organisations or neighbourhood associations tended to wane in favour of more expressive (e.g. fitness clubs, meditation gatherings…) or affective (e.g. friendships) forms of social capital. The latter may, furthermore, be connected more to the workplace as a locus rather than to the local community itself. A typical post-materialist buzzword is "cocooning", and protests more and more become of the NIMBY-type (i.e. "not in my backyard").[5]

(iii)   In tandem with growing tolerance for ethnic and sexual minorities and for different life styles, the period after the 1960s has also been

characterised by reduced social control. In this growing vacuum displays of publicly disruptive behaviour have risen (e.g. freeriding, littering, street crime…). This has not only produced reactions that are sometimes overly obsessed with security issues, but it has even more stimulated the retreat of citizens to their own private life spheres.

(iv)   Work values and socialisation values equally display a profound shift in favour of the expressive traits, and above all, a rejection of authority. One is no longer satisfied with good material conditions (pay, job security, benefits…) but more and more aspects of self-realisation are being stressed (e.g. interesting work, team work and consultation, work that meets one's abilities, contact with persons, variation in tasks and time-flexibility). This anti-Fordist reaction is obviously related to education and social class (cf. Kohn, 1977), and its rise is closely associated with the growth of white collar employment. The rise of expressive traits is equally pronounced in the qualities that ought to be stressed in socialisation. All elements of conformity, such as obedience, order and neatness, thrift and hard work, traditional gender role conformity and religious faith, or with community involvement and solidarity (thinking of others, loyalty) have taken a dip in favour of those that accentuate personality (being interested, thinking for oneself, self-presentation, independence) (cf. Alwin, 1989, 1992). Furthermore, the long term trend toward these expressive values displays an acceleration during the 1960s and 1970s, and they are still layered according to distinct cohort profiles over time.[6]

(v)   The aspiration for and the manifestation of more symmetrical gender roles equally stem from several sources. Greater female autonomy in the economic sense is equally grounded in the values system and the overall refusal of any form of dominance or authority. Fully egalitarian gender relations may not be found in most domains, nor did gender equality progress linearly in time, but the current situation in the West is by no means comparable to the gender segregated situation prevailing during the FDT. If egalitarian gender relations constitute an element of quality in a union, and if such quality aspects are open to recurrent evaluations, either one of the partners can retreat and at any point in time. The outcome has of course been more separations and more divorce, and more divorce at short marriage durations as well. Legal adaptations have reduced exit costs, and these, in tandem with recurrent quality assessments, have contributed to the legitimisation of "open future" strategies. These are almost synonymous with the deregulation of life course

transitions, and hence with all the demographic features of the SDT. Parenthood used to be the major obstacle to this open future orientation, but as the SDT advances, also this obstacle seems to weaken.

There are two conclusions to be drawn at this point. Firstly, the structural and cultural props of the SDT are of course rooted in the historical antecedents that produced the FDT, but the evolution is not a smooth one and even less a linear one. As we have tried to summarise in table 1 and in the comments, there are just too many pattern reversals to entertain the notion of a single transition. As a consequence, we shall maintain the distinction between the FDT and SDT. Secondly, two distinct historical phases, each with its own *logique sociale*, will equally be distinct in their consequences. The fear that sustained subreplacement fertility will lead to a shrinking and ageing labour force, and therefore to problems for the western European social security systems, is not unfounded. Nor are the fears that family instability will cause new forms of exclusion and poverty (e.g. among singles and lone mothers). In K. Kiernan's words: "the SDT is not kind to all". Moreover, the demographics of the SDT will, sooner rather than later, create a need for more foreign immigration, and this will push western Europe further along the path of imperfectly integrated multicultural societies. The FDT contributed to the strengthening of social cohesion, the SDT does not.

4. Is there a common spatial pattern for two successive innovations?

In the introduction we have posed the questions whether (i) there is a common and more general model for successive behavioural innovations and (ii) whether the latter diffuse in space according to similar principles. In this section we shall try to show with data for French départements, Belgian arrondissements and Swiss cantons that the spatial patterns of the FDT and of the SDT display remarkable similarities and that both are connected to cultural patterns that have been sustained over a long period of time in the three countries concerned.

To this end we have used a set of demographic indicators pertaining to the FDT and SDT, and a set of cultural and socio-economic indicators. The FDT indicators include measurements related to the speed of the historical marital fertility transition or their levels at various points in time, measurements of the decline of the Malthusian marriage pattern, measures of illegitimate fertility and of endogamy. The SDT indicators pertain to the

rise in divorce rates, in premarital cohabitation and in births out of wedlock which now predominantly occur to cohabiting couples. On the socio-economic side we have included indicators concerning the contrast between peasant and capitalist agriculture (for France), employment in agriculture in general (Belgium and Switzerland) and of urbanisation. The cultural indicators pertain to the various waves of secularisation and to linguistic divisions in the three countries. In Switzerland, thanks to the frequent referendums, we have also been able to trace such cultural continuities over time by incorporating measures related to fears for *Ueberfremdung*, female political rights and the liberalisation of abortion. All these indicators are defined in table 2 for France, table 4 for Belgium and table 6 for Switzerland.[7]

The detailed historical narratives of the FDT will not be repeated here since we have dealt with them elsewhere (Lesthaeghe, 1992; Lesthaeghe and Neels, 2000). However, we shall extend these analyses by incorporating the demographic indicators of the SDT. In doing so, we proceed with a canonical correlation analysis in which all the demographic indicators of FDT and SDT are entered as y-variables and all socio-economic and cultural indicators as x-variables. Canonical correlation analysis then constructs latent variables of indicators (canonical variates), i.e. Y1…..Yn and X1…..Xn in such a way that the correlation between Y1 and X1 is maximal, and so on for Y2 and X2 and all other canonical variates. Furthermore, an orthogonal design is being used so that the sets of canonical variates are unrelated to each other. In other words, the second pair of canonical variates X2 and Y2 is unrelated to the first pair X1 and Y1, and the third pair unrelated to the first two. Also, the correlation coefficients between the y-indicators and the canonical variates Y1, Y2,…Yn or between the x-indicators and canonical variates X1, X2…Xn can be computed to give a meaning to all latent dimensions. Obviously, canonical correlation analysis only brings out an underlying structure of associations between the x and y-indicators respectively, but does not quantify a more detailed complex causal structure. Given the ecological nature of our data, any particular causal model would be hard to defend. *Hence, we are looking for similarities between the maps of FDT and SDT indicators and then for similarities between the maps of socio-economic and cultural variables, and finally for similarities between these two.* The results for the three countries are given in tables 3, 5 and 7. Also, several maps are included in the appendix so that the areas of innovation can be identified.

4.1. THE FRENCH TRANSITIONS

As is well known, the French FDT had already started during the 18th Century and preceded any form of industrialisation or urbanisation. Moreover, the FDT in France took off when real incomes were declining and reached the lowest level of the Century on the eve of the French Revolution. The geography of the French FDT is largely conditioned by the following factors:

(i)   Both fertility control within marriage and the weakening of the late Malthusian marriage pattern occur first in regions with a capitalist and extensive agriculture operating with agricultural labourers (*journaliers, métayers*) and last in regions with peasant agriculture (cf. Weir, 1982). Regions with capitalist agriculture are furthermore characterised by a predominance of equal sharing of inheritance, whereas regions with peasant agriculture had inheritance systems based on primogeniture or testamentary preferences. Small peasant properties could then be defended against fragmentation, and also the high degree of endogamy (cousin-marriage) served the same purpose. In this way, younger siblings were pushed out of the system, which contributed to the maintenance of later marriage or celibacy. Finally, illegitimacy was low in areas with peasant agriculture, so that also this principle of the Malthusian "prudent marriage" was more strictly adhered to.

(ii)   The FDT in France also occurs in areas that had undergone an early secularisation, whereas areas that resisted the Revolution and remained loyal to the Ancien Régime and the Pope (see *prêtres réfractaires*) had a late marital fertility transition.

(iii)   The FDT also tended to start in areas that were homogeneously French-speaking. Areas with languages other than French or with local patois and no writing in French have a late FDT. The survival of patois or other languages not only produced a barrier to diffusion, but also reflected political resistance of the periphery against the core.

These three features emerge also very clearly from the canonical correlation analysis in table 3. The demographic FDT indicators unambiguously identify the latent variable Y1 in the first canonical variate as the *dimension of demographic innovation*. Y1 is positively correlated with the weakening of the Malthusian marriage pattern (positive correlations with the proportions married and illegitimacy in the 19th Century), and negatively correlated with the levels of marital fertility. Furthermore, Y1 is also

negatively correlated with the resistance of consanguinity in marriage, measured as late as 1911. The striking finding, however, is that the *SDT-indicators are loading equally well on this demographic innovation dimension*: procreation within cohabiting unions (i.e. non-marital births in 1989-1991) in the French départements is as good an indicator of Y1 as the levels of marital fertility 150 years earlier, and so is the incidence of divorce in 1990. At the other side, X1 identifies the regions which had *both capitalist agriculture and early secularisation*. Indicators of Catholic fidelity (*prêtres réfractaires* refusing the oath of allegiance to the revolutionary constitution, ordinations and priests among army recruits during the 18th and 19th Centuries) are all strongly and negatively correlated with X1, whereas the proportion of parishes without priests (vacant vicarages) is a positive correlate. Similarly, X1 also identifies the presence of landless labour, the move away from inegalitarian inheritance rules and the ability of writing in French. Equally striking is that the secularisation map of France remained very stable till at least the 1960s: the single best negative indicator of X1 is the proportion of adults attending Sunday Mass in the 1960-70 period. Hence, the overall summary is that there is a unique demographic innovation dimension for the FDT and SDT indicators, and that this dimension Y1 is very strongly related (canonical r=0.92) to the overall secularisation dimension X1 and its roots in the 18th and 19th Century contrast between the two systems of agricultural production. Evidently, the French historical fertility transition was initiated as a defensive reaction to declining wages in areas with such agricultural wage earners (see R-condition) and furthermore could be realised as a result of weakening religious obstacles (see W-condition). It also tended to stop at linguistic borders. Finally, very much the same spatial pattern of innovation and diffusion − and hence correlations with historical determinants − is found for the SDT.

The analysis in table 3 identifies two more canonical variates that are unrelated to the dimensions just discussed. The second canonical covariate links the larger historical age differences between husbands and wives in the 1860s to low secularisation and the predominance of peasant agriculture with inegalitarian inheritance. The third canonical variate is of greater interest here since it connects the divorce rate of 1975 to areas that historically belong to the French-speaking core of the country. Evidently, when divorce rates rose during the 1960s and 1970s, mainly areas with linguistic particularism maintained the lower rates. However, by 1990 the divorce map of France had converged more and more in the direction of the overall demographic innovation dimension of the first canonical variate (i.e. Y1 rather than Y3).

The French maps, brought together in the appendix, provide the geographical details. There are essentially five broader areas which are not part of the demographically innovative core:

(i)   The départements of Pas-de-Calais and Nord in the north-western corner (formerly a part of the Spanish Low Countries and partially Flemish-speaking during the 19th Century);

(ii)   The north-eastern corner along the Luxembourg, German and Swiss borders, and incorporating Alsace (partly German speaking), Lorraine, the Jura and northern Savoie, i.e. often areas outside France after Napoleon's defeat;

(iii)   The Massif Central and, across the Rhône, also the Dauphiné;

(iv)   The western Pyrénées départements (partially Basque-speaking);

(v)   The large western area including southern Normandy, the whole of Brittany and the Vendée.

A striking feature of these maps is that both the innovative part of France and the areas that are demographic followers contain rural and urban/industrial départements alike. For instance, Paris and Bordeaux are always part of the innovative core, but the industrial agglomerations of the Nord and Pas-de-Calais or of Lorraine always belong to the opposite side. Similarly, the innovative part contains just as many strictly rural départements with fewer women active in the secondary or tertiary sectors as the areas that lag. Apparently, the cultural-political dimension operationalised through indicators of secularisation and historical linguistic particularism is the essential ingredient in accounting for the two waves of demographic innovation linked to the FDT and SDT respectively. All of this points to the importance of the W-distribution as the dominant bottleneck condition in determining the timing of the demographic innovations.

4.2. THE BELGIAN TRANSITIONS

In Belgium the FDT starts more than a century later than in France, and it occurs well after the country's industrial take-off (which followed shortly after that of England, i.e. during the first decades of the 19th Century). As a consequence the contrast between rural and urban or industrial areas is considerably more prominent than in France in accounting for the FDT. Nevertheless, parts of Belgium (all in Wallonia) had a first secularisation wave that started during the French period (1792-1815) and that was inspired by the humanist ideals of the French Revolution. At the time of Belgian independence in 1830 this secular tradition was firmly grounded in

the Liberal party, and much of the 19th Century politics was characterised by the Liberal-Catholic opposition. The geography of secularisation in Belgium shows that the first secularisation wave mainly affected the Walloon south (i.e. in the rural Ardennes arrondissements) and the city of Liège. Northern Wallonia followed at the time of a second secularisation wave that accompanied the rise of the Socialist party. At the onset of the FDT, it was this Walloon industrial belt that had the higher level of secularisation, immediately followed by the Walloon rural arrondissements and Brussels. At that time, the linguistic border was a demarcation line with respect to both, fertility control and secularisation. In Flanders, the diffusion, again of both, started from the Brussels-Antwerp axis, and first moved westward toward the coast, and at the end also eastward toward Limburg. The SDT followed this early diffusion pattern again, as can be seen from the maps in the appendix. First, there was a large Walloon area of growth of premarital cohabitation and of fertility within cohabiting unions that ran just south over the entire length of the language border. The SDT subsequently penetrated toward the rural arrondissements of southern Wallonia. Next came the diffusion into Flanders, again along the Brussels-Antwerp axis. The diffusion towards the west and east relative to this central Flemish axis constitutes once more the last phase of the entire diffusion process.

The results of the canonical correlation analysis, reported in table 5, provide an overall picture of statistical correspondence. The first canonical variable links the demographic dimension (Y1) to a socio-economic and cultural dimension (X1) with a canonical r approaching unity for 41 arrondissements. The demographic latent variable Y1 again identifies the dimension of innovation. The best FDT indicators are, not surprisingly, all those related to a more rapid marital fertility transition and to the weakening of the late Malthusian marriage pattern. *But, as in France, the SDT-indicators load just as strongly on this overall innovation dimension*: the rise of divorce rates in the late 1960s, the proportions of women 20-24 and 25-29 in cohabiting unions, and the index of non-marital fertility during the early 1990s all have correlations with Y1 of +0.78 or better. The corresponding X1 dimension is identified by all the secularisation indicators, starting with the refusal of observing the traditional Catholic marriage ban during Lent and Advent in the 1840s, and ending more than a century later with voting for secular parties in 1954 (i.e. the last "school war") and Sunday Mass absenteeism in the 1960s. This secularisation dimension also correlates negatively with the socio-economic indicator of the survival of familial forms of production (agriculture and cottage industries) in 1900. The urban-rural distinction of the later 20th Century

plays no role whatsoever, largely because the SDT-indicators fail to correlate with it. Also indicators of advanced female education or labour force participation in the tertiary sector do not correlate with the regional patterning of the SDT. Rather the opposite is true: cohabitation and non-marital fertility in Belgium are more typical of low income areas and areas with higher mortality and higher unemployment than the national average. These areas are furthermore not only confined to the old 19th Century industrial belt in Wallonia, but equally encompass rural arrondissements.

The second canonical variate, finally, links illegitimate fertility of the late 19th Century mainly to low adult literacy in 1900 and to the urban-rural divide. This actually means that 19th Century illegitimacy was particularly high among industrial workers of towns and of the industrial Walloon belt. By contrast, illegitimacy was particularly low in regions with the survival of familial production in agriculture and cottage industries jointly. Also note that at present non-marital fertility is more strongly related to the overall demographic innovation dimension Y1, and hence also to the SDT, than to its historical antecedent which identifies Y2.

The conclusions for the Belgian example are similar to those for France:
(i)   The cultural dimension characterising the history of secularisation in Belgian regions had a decisive impact in determining the leads and lags with respect to both the FDT and SDT. This double impact mainly stems from the long term stability of the regional secularisation differentials.
(ii)   The regional contrasts are reinforced by the Belgian language border, which proved once more to be a temporary barrier for the diffusion of the SDT components.
(iii)   In France, the decisive socio-economic structural component was the type of agricultural system, whereas in Belgium this role is assumed by the transformations linked to industrialisation. This is hardly surprising given that the FDT in France had started well before the Industrial Revolution, and in Belgium several decades thereafter.

The implication of point (iii) is that the R-condition for demographic innovation in Belgium was not connected to defensive motivations as in France, but rather to an offensive strategy. The Belgian FDT occurs at the end of nearly two decades of rapidly rising real wages (1860-1880) and of the opening up of new employment opportunities. According to the classic economic reading, the Belgian conditions for investment in the quality of children rather than their quantity were ideal at that time.[8] Hence, fertility limitation would be better for both the present and the future generations to

take advantage of these new opportunities that further economic growth would create. The implication of point (i), on the other hand, is that the cultural bottleneck condition is highly relevant again: spatial leads and lags in both FDT and SDT are largely conditioned by the shifts in the W-distribution in each of the areas. Point (ii), finally, shows the importance of cultural borders in the diffusion of innovation, again with respect to both FDT and SDT.

4.3. THE SWISS TRANSITIONS

Swiss society is characterised by linguistic and political-religious divisions that are even more complex than the Belgian ones. In fact, four major linguistic regions need to be considered (German, French, Italian, Romanche) and the religious spectrum contains three poles as well (Catholic, Protestant, Freethinker). As a result, Switzerland too is an ideal example for studying the links between FDT and SDT in relation to cultural and socio-economic heterogeneity. Moreover, Switzerland has a long tradition of referendums and the results dotted over time (here from 1902 to 1978) can be used to verify the degree of regional stability of ideational dimensions that are linked to FDT and SDT.

The canonical correlation analysis for Switzerland reported in Table 7 follows the same design as in the two previous countries: the demographic indicators are entered on the y-side and the cultural or socio-economic indicators on the x-side. The outcome, however, is less clear cut than in the French or Belgian analyses. In the latter two cases the Y-dimension of the first canonical variable absorbed all indicators of demographic innovation irrespective of their belonging to the FDT or SDT. In the Swiss analysis, by contrast, both FDT and SDT indicators load simultaneously on two orthogonal canonical covariates. In the first canonical variate, the best demographic indicators of Y1 are the speed of the historical marital fertility decline (FDT), the recent incidence of divorce (SDT), and the current patterns of non-marital fertility and cohabitation among women 25-29 (SDT). However, the SDT-indicators pertaining to cohabitation and non-marital fertility are also related to the second canonical variate Y2, which essentially brings out the historical spatial pattern of illegitimate fertility. This result stems from the fact that the speed of the original marital fertility decline and historical illegitimacy in Switzerland were weakly correlated (hence their strong loadings on Y1 and Y2 respectively). The recent rise in divorce has tended to follow more the spatial pattern of the historical fertility decline, whereas the recent increase in non-marital births and cohabitation mirrored more clearly the historical pattern of illegitimacy. It

should be noted, though, that premarital cohabitation in Switzerland is fairly widespread, but that procreation within cohabitation is still very low by western European standards. Nevertheless, this recent modest rise is occurring more in areas that had the higher levels in 1900 than in the areas that led the fertility and nuptiality transitions of the FDT. The "revenge of history" with respect to illegitimacy and cohabitation, which is so pronounced for Austria, is also present in Switzerland, but at much lower levels of incidence.

On the x-side, the message is equally blurred. The best cultural and socio-economic correlates of the 19th Century marital fertility transition and of the incidence of divorce in the 1970s are employment outside the familial production sector (i.e. agriculture and cottage industries) in 1910 and two indicators of secularisation, i.e. the vote for secular political parties in 1919-22 and the more recent pro-abortion vote in 1978. Protestantism was equally positively related to these two demographic outcomes, whereas old local particularisms (fear for *Ueberfremdung* in 1928 and rejection of state schools in 1902) acted as a counterforce. The second canonical variate furthermore shows that the current levels of non-marital fertility and cohabitation are not only mirroring a much older pattern of illegitimacy but are also highest in cantons that were politically less particularistic (weaker resistance to immigration and to state schools) and Protestant as well.

The more detailed geography for the Swiss indicators can be gleaned from the maps in the appendix. At least, there is some cohesion to the FDT and SDT stories in the sense that there is a set of cantons that is systematically at the forefront of innovation and another set that offers the greatest resistance. The former group is composed mainly of Basel-Stadt and Land, Zürich and Schaffhausen, whereas the second group typically contains Valais, Fribourg, Obwalden, Nidwalden, Uri, Appenzell I.Rh., and Graubunden. The latter group contains 6 of the 13 Catholic cantons and only one with a Protestant-Catholic mixture (Graubunden). Cohabitation as a typical SDT-feature has progressed mainly in German speaking cantons with a Protestant tradition, earlier secularisation and a greater openness to foreigners.

To sum up, the Swiss spatial patterns of FDT, SDT and their covariates do not form as a cohesive picture as in France or especially Belgium. At present, still two orthogonal dimensions appear, and both FDT and SDT indicators load on both in a mixed fashion. Nevertheless, the direction of the correlations is unambiguous: the demographic indicators always exhibit a positive correlation with Protestantism, early secularisation, a rejection of local particularism and a stronger stress on female autonomy. But,

respecting this ordering produced by the ideational correlates, francophone cantons were in the lead during the FDT, whereas several German-speaking cantons tend to have taken over during the SDT. Such a shift in "pole position" from one linguistic area to the other did not occur in Belgium, and this constitutes the main difference between the two countries. It also accounts, at least in part, for the weaker statistical continuity witnessed in Switzerland.[9]

5. Conclusions

In this paper we have argued that the SDT constitutes a major behavioural pattern reversal when compared to the FDT: marked postponement of parenthood leads to universal subreplacement fertility, home leaving is again postponed, the trend in marriage is inverted, cohabitation and procreation within informal unions produce a return to higher historical levels of non-marital fertility, separations and divorce mark an end to life-long commitments, and remarriage is replaced by alternative forms of informal partnerships. All these demographic turns are connected to structural and ideational reversals, and most of these mainly started to change the very nature of Western European societies from the 1960s onward. The outcome is that the SDT cannot be considered as a mere prolongation of the FDT, and should be identified as a separate wave of behavioural innovation instead.

As elaborated in Coale's "Ready, Willing and Able" scheme, behavioural innovations only emerge when these three preconditions are simultaneously met. The RWA-model implies that the observed leads and lags in transitions from one behavioural pattern to another will be strongly conditioned by the slowest moving distribution of either R, W or A. Moreover, the means, variances and speeds of movement of these three distributions are all a function of network effects and not solely of individual attributes. This implies that leads and lags with respect to any innovation wave are highly likely to be socially or spatially clustered. For European countries, with long histories of internal linguistic, social and economic heterogeneity, spatial clusters are of particular relevance. The Princeton project (Coale and Watkins, 1986) and also more formal spatial analyses (e.g. Bocquet-Appel and Jacobi, 1996) clearly documented the emergence of regional subcultures that either fostered or obstructed innovations associated with the FDT. In this paper we also wanted to find out whether the same or different spatial clusters would emerge with respect to leads and lags in the SDT. Here, we only reported on three countries, but it is obvious that similar analyses could also be performed in many others,

and that the conclusions for France, Belgium and Switzerland are not necessarily valid across Europe. In fact, the detailed narratives for the FDT revealed a plurality of patterns, and we expect no less heterogeneity with respect to the SDT.

The main conclusions from the present three country-analysis are:
(i) Regions that were at the forefront of FDT innovation are also the locations that are more advanced with respect to the SDT. Conversely, areas that had a lagged FDT are at present also more resistant in adopting the SDT traits.

(ii) This holds irrespectively of the century of onset of the FDT. In other words, the FDT-SDT spatial connection holds for France, where the FDT started well before the Industrial Revolution, and in Belgium and Switzerland, where the FDT occurred during the industrial transformation.

(iii) The socio-economic and cultural correlates of the FDT and SDT spatial demographic differences are essentially those that emerged at the time of the FDT. For France, this means that SDT-correlates go at least as far back as the late 18th Century, and for Switzerland and Belgium that the SDT-maps are equally firmly rooted in the spatial structural and cultural differentiations emerging during the 19th Century.

(iv) The structural predictors for the SDT should be urbanity, high levels of education, high female labour force participation and the increased concentration of such employment in the tertiary sector. This holds best in Switzerland where the SDT is most clearly connected to urbanity and economic development. The link is much weaker in France and virtually absent in Belgium. In fact, in the latter country SDT innovation is located in the old industrial belt and several adjacent rural arrondissements that are mostly at the unfavourable end of the distributions with respect to household income, employment, growth of the tertiary sector, female education and even life expectancy.

(v) By contrast, in all three countries the earlier link between the FDT and ideational covariates is strikingly prolonged and equally applicable to the SDT. An essential part of the explanation is that the secularisation dimension, as it emerged in the 18th or 19th Centuries, maintained its spatial features until at least the 1960s in all these countries, and that further ideational developments related to individual autonomy were grafted on it. In other words, FDT spatial differentiations stemmed from initial secularisation contrasts, whereas SDT spatial patterning is rooted in the offshoots of early

secularisation that are connected with all aspects of individual autonomy and rejection of traditional forms of authority. This ideational continuity may supersede the structural effects, as in the examples of France and particularly of Belgium.

(vi)   The connection with ideational evolution suggests that the W-condition may be the crucial one in both waves of demographic innovation. If the W-distribution is the slowest to move or has a sizeable lower tail, and if the most open or most resistant populations respectively are clustered spatially, then the outcome maps will essentially mirror these W-differentials almost irrespectively of how far the R and A-distributions are ahead. In other words, effects of structural factors that mainly affect the R-condition can be highly relevant, and yet their manifestation on the outcome maps can be suppressed if it is the W-condition that is dominant in determining the minima. In short, the bottleneck condition shapes the regional differentials to a disproportionately large degree.

We started with a story of discontinuity: the SDT is a pattern reversal of the FDT grounded in an equally crucial shift in individual and societal priorities. In the empirical section we found essentially continuity: FDT and SDT indicators remained spatially correlated and all of them remained connected to the historical structural and especially cultural covariates. Discontinuity versus continuity: we had a riddle. The solution of the conundrum has several steps that are summarised by the diagram below.

Outcome: one single spatial innovation dimension for two separate innovation waves
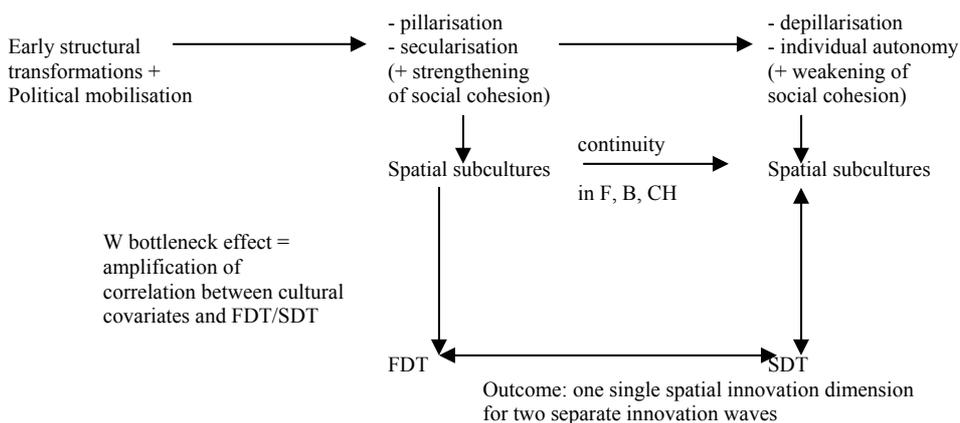
Firstly, early structural factors in combination with political mobilisation produced the spatially differentiated outcomes in the ideational domain.

These are captured by the initial secularisation maps. The secularisation dimension exhibited long term stability and subsequently fed the ideational props of the SDT associated with all manifestations of individual autonomy. What was altered in the process was that the strengthening of social cohesion made room for a weakening of it. Nevertheless, the spatial continuity was maintained to a remarkable degree in all three countries. These spatial subcultures codetermined the FDT and SDT. Their impact is furthermore enlarged if W is the bottleneck condition in both instances. In that case, the FDT maps and SDT maps strongly reflect the stable subcultures, which then accounts for their strong intercorrelation as well. FDT and SDT indicators now become correlates of a single dimension of spatially differentiated demographic innovation, and this overall dimension continues to correlate with the historical antecedents of more than a century ago (and in France two centuries ago!). In other words, two separate waves of innovation are strongly spatially correlated essentially because of the spatial continuity in factors that determine the W-condition on the cultural bottleneck.

The spatial patterning documented via mere statistical associations between maps stops of course short of a more penetrating causal model linking the demographic outcomes to structural and cultural antecedents. Also, with the ecological data in hand, we cannot proceed with any finer testing of specific models of diffusion. Nevertheless, this article draws attention to the feature of striking historical spatial continuity, and to the plausibility of attaching a "cultural reading" to it.

Evidently, the outcomes for the three countries raise new questions. For instance, how can such historical continuity emerge in the presence of large migration streams over this extensive period of time? Does migration reinforce already existing spatial patterns via selection based on ideational factors as well, or does it lead to a nationwide homogenisation and spatial blurring of patterns instead? The net outcome documented here is that such blurring has not taken place in Belgium and France, and only to a minor extent in Switzerland.[10] This does not prove that migration is culturally selective, but our findings would at least raise this possibility as a plausible hypothesis. Conversely, if migration has a spatially equalising effect, then our findings suggest that there are powerful counterforces at work that regenerate historical spatial differentials, and that these are likely to be connected to the regionally differentiated processes of intergenerational "cultural socialisation".

Finally, we also need to stress that the results for three countries may only document a particular subclass of possible outcomes. Other patterns in other countries are likely to emerge and yield additional "anchored narratives". This would not be surprising given that the FDT experience in European regions displayed ample variation and path dependency to start with.

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Table 1: Overview of demographic and societal characteristics respectively related to the FDT and SDT (Western Europe).

FDT	SDT
A. Marriage	
• Rise in proportions marrying, declining age at first marriage	• Fall in proportions married, rise in age at first marriage
• Low or reduced cohabitation	• Rise in cohabitation (pre- & postmarital)
• Low divorce	• Rise in divorce, earlier divorce
• High remarriage	• Decline of remarriage following both divorce and widowhood
B. Fertility	
• Decline in marital fertility via reductions at older ages, lowering mean ages at first parenthood	• Further decline in fertility via postponement, increasing mean age at first parenthood, structural subreplacement fertility
• Deficient contraception, parity failures	• Efficient contraception (exceptions in specific social groups)
• Declining illegitimate fertility	• Rising extra-marital fertility, parenthood within cohabitation
• Low definitive childlessness among married couples.	• Rising definitive childlessness in unions
C. Societal background	
• Preoccupations with basic material needs: income, work conditions, housing, health, schooling, social security. Solidarity prime value	• Rise of "higher order" needs: individual autonomy, self-actualisation, expressive work and socialisation values, grass-roots democracy, recognition. Tolerance prime value.
• Rising memberships of political, civic and community oriented networks. Strengthening of social cohesion	• Disengagement from civic and community oriented networks, social capital shifts to expressive and affective types. Weakening of social cohesion.
• Strong normative regulation by State and Churches. First secularisation wave, political and social "pillarisation"	• Retreat of the State, second secularisation wave, sexual revolution, refusal of authority, political "depillarisation".
• Segregated gender roles, familistic policies, embourgeoisement.	• Rising symmetry in gender roles, female economic autonomy.
• Ordered life course transitions, prudent marriage and dominance of one single family model.	• Flexible life course organisation, multiple lifestyles, open future.

Table 2: Definitions and sources of indicators used in the analysis of French reproductive patterns in the 19th and 20th centuries

A. Demographic Indicators

- **I$_g$** *(1831, 1851, 1876)* — Index of marital fertility relative to the Hutterite standard of uncontrolled fertility *(A.J. Coale)* — van de Walle, 1974: 226-467

- **I$_m$** *(1831, 1851, 1876)* — Index of proportions married *(A.J. Coale)* — Ibidem

- **I$_h$** *(1831)* — Index of non-marital fertility *(A.J. Coale)* — Ibidem

- **Age Difference Marriage** *(1861-65)* — Husband-wife difference in age at marriage — Le Bras & Todd, 1981: 440

- **Endogamy** *(1911-13)* — Rank of départements according to the percentage of cousin marriages (grouped from 0 = low to 11 = highest incidence) — Ibidem: 215

- **Divorce** *(1975, 1990)* — Divorce rate per 100.000 married women — INSEE & Min. Justice

- **Non-marital Births** *(1989-1991)* — Percent of all births non-marital — INSEE

B. Agricultural System & Inheritance Patterns

- **Capitalist Agriculture** *(1852)* — Areas with large farms operating with *journaliers* and areas with *métayage* (=1) versus areas with smallholders and tenants (17% + fermage) (=0) — Todd, 1988: 84

- **Inegalitarian Inheritance** *(1900)* — Inegalitarian system with primogeniture or other preferential treatment (=1) versus egalitarian and equal division (=0) — Todd, 1988: 32

C. Secularization

- **Refusal revolutionary Oath of Allegiance** *(1791)* — Refusal of oath of allegiance to new revolutionary constitution (= *prêtres réfractaires*): 0 = less than 40% refusal, 1 = 40-50%, 2 = more than 50% — Todd, 1988: 64 *(based on T. Tackett, 1986)*

- **Priests among Army Recruits** *(1825-35)* — Priests per 10.000 recruits — Le Bras & Todd, 1981: 430

- **Ordinations** *(1876)* — Ordination of priests per 100.000 population — Ibidem

• **Vacant Vicarages** *(1885)*	Proportion of vicarages without priest: 0 = less than 6%, 1 = 6-15%, 2 = 15-21%, 3 = more than 21%	Ibidem: 379
• **Sunday Mass Attendance** *(1960-70)*	Percent of rural population attending Sunday mass	Ibidem: 430 *(based on R. Boulard)*

D. Literacy and Language

• **No Writing** *(1872)*	Percentage op population that can at most read French, but cannot write it	Ibidem: 454
• **Linguistic Particularism** *(1863)*	Persistence of patois or languages other than French: 0 = all speak French, 1 = traces of patois, 2 = large proportion or entire villages non-francophone, 4= more than 50% non-francophone	Ibidem: 279

Table 3: The connection between demographic indicators of FDT and SDT (y-variables) and socio-economic or cultural indicators (x-variables) – canonical correlation analysis results for French départements.

1. first canonical variate: can. correlation = .92, sign.=.000	
demographic dimension Y1 *best indicators (r gt .40)*	*socio-econ & cultural dimension X1* *best indicators (r gt .40)*
• earlier marriage 1851: +.80	• <u>sunday mass 1960</u>: -.92
earlier marriage 1831: +.79	• priest ordinations 1876 -.72
• <u>non-marital births 1989-91</u>: +.75	• priests (army recruits) 1825 : -.65
• <u>divorce 1990</u>: +.69	• not writing french 1872: -.63
• level marital fertility 1876: -.68	• capitalist agriculture 1851: +.62
• level marital fertility 1831: -.66	• prêtres refractaires 1791: -.59
• non-marital fertility 1831: +.62	• vacant vicarages 1885 : +.58
• endogamy (cousin marriage) 1911 : -.45	• inegalitarian inheritance 1900 : -.45
• <u>divorce 1975</u> : +.43	
2. second canonical variate: can. corr. = .80 sign.=.000	
demographic dimension Y2	*socio-econ & cultural dimension X2*
• large age diff. husb-wife 1861: +.54	• prêtres refractaires 1791: +.52
	• inegalit. inheritance 1900 : +.49
	• priests (army recruits) 1825 : +.42
3. third canonical variate: can. corr. = .62 sign.=.132	
demographic dimension Y3	*socio-econ. & cultural dimension X3*
• <u>divorce 1975</u> : +.41:	• non-french & patois 1863 : -.77
	• inegal. inheritance 1900 : -.58
	• not writing french 1872 : -.56

<u>Note</u>: underlined indicators pertain to the SDT.

Table 4: Definitions and sources of indicators used in the analysis of Belgian reproductive patterns in the 19th and 20th centuries

A. Demographic Indicators

- **I$_g$** *(1880, 1900)* — Coale's Index (1963) of marital fertility, indirectly standardized for age and marital status composition and based on Hutterite fertility standard — Lesthaeghe, 1977

- **Delta I$_g$** *(1880-1910)* — Percentage of the total marital fertility transition already completed before 1910, measured as (I$_g$1910 – I$_g$1880)/(I$_g$1880 - 0.200), where I$_g$ = 0.200 is considered as the end point of the transition, i.e. speed marital fertility decline — Lesthaeghe, 1977

- **I$_m$** *(1880)* — Coale's Index of proportions married weighted by Hutterite Fertility — Lesthaeghe, 1977

- **EM** *(1880)* — Percentage ever-married women, age 20-24 — Lesthaeghe, 1977

- **I$_h$** *(1880)* — Coale's Index of non-marital fertility — Lesthaeghe, 1977

- **Divorce** *(1967-70)* — Divorce rate per 10.000 married women — Lesthaeghe, own data collection

- **I$_c$** *(1992)* — Index of non-marital fertility comparable to Coale's I$_h$, except weighting by Belgian national age-specific fertility rates of 1989-91 instead of Hutterite fertility — P. Deboosere, 2000

- **Cohabitation** *(1991)* — Percentage of all women 20-24 or 25-29 currently in cohabitation — P. Deboosere, 2000

B. Socio-economic indicators

- **Agcot** *(1900)* — Percentage of male active population employed in agriculture and cottage industries — Lesthaeghe & Wilson, 1986

- **Agriculture** *(1970)* — Percentage of male active population employed in agriculture — Lesthaeghe, own data collection

Table 4, Continued

C. Secularization

- **MLA** *(1841-47, 1860-65, 1881-84)*   Marriage index Lent & Advent, i.e. percentage of total annual number of marriages in March and December divided by 2/12 (normal share for 2 months); averaged over several years to neutralise effect of variable date for Easter   Lesthaeghe, 1991

- **Votes for Secular Parties** *(1919, 1958)*   Percentage of votes for Socialists, Liberals and Communists in parliamentary elections   Lesthaeghe, 1977

- **Sunday Mass Attendance** *(1964)*   Percent of adult population 15+ absent at Sunday mass   Dobbelaere (communicated)

D. Literacy

- **Literacy** *(1900)*   Percentage op population 15+, able to read and write   Lesthaeghe, 1977

Note: There are currently 43 arrondissements instead of 41. The old Brussels arrondissement has been recreated by bringing the Brussels Capital Region together with the Flemish arrondissement of Halle-Vilvoorde, whereas the newly formed French-speaking arrondissement of Mouscron (formerly a small section of the Flemish arrondissements of Ypres and Kortrijk) was dropped from the analysis. In other words, we have stayed as closely as possible to the historical division of the territory.

Table 5: The connection between demographic indicators of FDT and SDT
(y-variables) and socio-economic or cultural indicators (x-variables) –
canonical correlation results for Belgian arrondissements

1. first canonical variate: can. correlation = .98 sign.=.000	
demographic dimension Y1	*socio-econ & cultural dimension X1*
best indicators (r gt .40)	*best indicators (r gt .40)*
• speed marit. fertility transit. 1880-1910: +.95	• % vote for secular parties, 1919: +.95
• level marit. fertility 1900: -.93	• % vote for secular parties 1958: +.90
• level non-marital fertility, 1992: +.92	• absenteism sunday mass. 1964: +.83
• divorce rate 1967-1970: +.91	• % males agric. & cottage industries, 1900: -.82
• cohabitation women 25-29, 1991: +.86	• marriages lent & advent 1881-84: +.79
• level marit. fertility, 1880: -.82	• marr. L&A, 1860-65: +.69
• cohabitation women 20-24, 1991: +.78	• marr. L&A, 1841-47: +.47
• earlier marriage, 1880: +.70	
2. second canonical variate: can. corr. = .93 sign.=.048	
demographic dimension Y2	*socio-econ & cultural dimension X2*
• non-marital fertility 1900: +.78	• % in agriculture, 1970: -.76
	• adult literacy, 1900: -.64
	• % males agric. & cottage ind. 1900: -.42

Note: underlined indicators pertain to the SDT.

Table 6: Definitions and sources of indicators used in the analysis of Swiss reproductive patterns in the 19th and 20th centuries

A. Demographic Indicators

- **Delta I_g** *(1860-1910)* — Proportion of the marital fertility decline realised before 1910, i.e. speed of marital fertility decline — Lesthaeghe & Wilson, 1986: 283

- **I_h** *(1900)* — Index of non-marital fertility *(A.J. Coale)* — Coale & Treadway, 1986: 149-151

- **I_m** *(1900)* — Index of proportions married *(A.J. Coale)* — Ibidem

- **Divorce** *(1970)* — Percentage of divorced women per 100 married women — Swiss Federal Statistical Office, own data collection

- **Non-marital Births** *(1999)* — Percent of all births out of wedlock — ibidem

- **Cohab 20-24, cohab 25-29** (1990) — Percentages of women 20-24 or 25-29 cohabiting among all women of these ages in a union — Census 1990, Swiss Federal Statistical Office

B. Socio-economic indicators

- **Family Labour** *(1910)* — Percentage of male labour force in agriculture and cottage industries — Lesthaeghe & Wilson, 1986

C. Cultural indicators

- **Protestant** *(1900)* — Percentage Protestant — F. van de Walle, s.d. manuscript

- **Votes for Secular Parties** *(1919-22)* — Percentage votes for 6 secular parties (incl. Liberals) in two elections — Lesthaeghe & Wilson, 1986: 283

- **Rejections Public Schools** *(1902)* — Percentage rejecting the foundation of public primary schools, referendum of 1902 — Swiss Federal Statistical Office, own data collection

- **Anti-immigration** *(1928)* — Percentage voting against immigration in 'Ueberfremdung' referendum of 1928 — Ibidem

- **Pro Female Suffrage** *(1971)* — Percentage in favour of women voting in municipal and cantonal elections, referendum of 1971 — Ibidem

- **Pro Abortion** *(1978)* — Percentage voting in favour of abortion liberalisation, referendum of 1978 — Ibidem

Table 7:   The connection between demographic indicators of FDT and SDT

(y-variables) and socio-economic or cultural indicators (x-variables) –

canonical correlation results for Swiss Cantons

1. first canonical variate: can.corr. = .96, sign.=.00	
demographic dimension Y1 *best indicators (r gt .40)*	*socio-econ & cultural dimension X1* *best indicators (r gt .40)*
• speed marit. fertility decline 1860-1910: +.95	• labour force in agric. + cottage ind., 1910: -.89
• <u>divorcees/100 married women, 1970</u>: +.79	• vote for secularised parties, 1919-22: +.89
• <u>pct. non-marital births, 1999</u>: +.52	• <u>vote pro abortion, 1977</u>: +.78
• <u>pct. women cohabiting 25-29, 1990</u>: +.41	• pct. Protestant, 1900: +.58
	• anti-immigration vote, 1928: -.56
	• rejection state schools, 1902: -.43
2. second canonical variate: can. corr. = .89, sign.=.02	
demographic dimension Y2 *best indicators (r gt 0.40)*	*socio-econ & cultural dimension X2* *best indicators (rgtT 0.40)*
• <u>pct. women cohabiting 20-24, 1990</u>: +.66	• anti-immigration vote, 1928 -.45
• <u>pct. women cohabiting 25-29, 1990</u> : +.65	• rejection state schools, 1902: -.42
• illegitimate fertility, 1900: +.60	• pct. Protestant, 1900 : +.42
• <u>non-marital births, 1999</u>: +.40	

<u>Note</u> : underlined indicators pertain to the SDT.

Notes

[1] In the Lesthaeghe-Vanderhoeft specification, beta-distributions were used to model the changing shapes of the three distributions in function of increasing means.

[2] Note that earlier marriage was not only rising with the growth of industrial labour, but was equally associated with the presence of wage labour in agricultural systems of the capitalist rather than of the peasantry type. This partially accounts, for instance, for earlier marriage in French regions in which the nuptiality transition precedes any industrialisation by half a century.

[3] For instance, immigration rates of Moroccans and Turks to Belgium are again in excess of 20 per 1000 nationals in this country since the middle of the 1990s, and between 1985 and 1997 370.000 persons acquired Belgian nationality. This is the equivalent of 3.2 times the annual number of births and worth 37 years of natural increase.

[4] The dictum in French "la place de la femme est au foyer", for instance, was coined by the communist leaning CGT labour union.

[5] Whether these traits will further prevail during the 21st Century is an open question. The retreat from civic and community-related networks have a social cost which becomes increasingly visible,and this may lead to a "communitarian" reaction (cf. Etzioni, 1998). Also Putnam's thesis of an overall disengagement and reduction in social capital may be exaggerated, but the shift from civic and community oriented social capital to expressive and more personal interest related networks is not.

[6] The shift toward expressive values in the work and socialisation spheres may in fact capture the Maslowian "higher order needs" better than do the Inglehart "post-materialist" items.

[7] The sources mentioned in tables 2, 4 and 6 are listed *in extenso* in Lesthaeghe (1992) and Lesthaeghe and Neels (2000). They are not included in the bibliography of this paper anymore. The demographic indicators for Switzerland can be found in Coale and Treadway (1986) or in the unpublished manuscript on the Swiss fertility decline by F. van de Walle. The referendum results were collected by ourselves at the Swiss Federal Statistical Office or from the newspaper reports published immediately after the public consultations.

[8] The Belgian economist Hector Denis, who was writing at the time of the onset of the FDT, produced a different reading of the R-condition. According to him, the fertility decline was not a response to the improving living conditions in the period 1860-1880 but, as in France, also a defensive reaction to the economic depression of the 1880s that followed. Denis' theory is an early precursor of relative deprivation theories: consumption aspirations of households had risen for twenty years, but could not be realised during the following decade, and only then marital fertility started declining.

[9] We have no particular hypothesis to account for this feature in Switzerland. Any influence from France and from Germany respectively would have worked the other way round, given that cohabitation and procreation within consensual unions are considerably more prevalent in France.

[10] The migration hypothesis can hardly be used to account for the new SDT lead emerging in a set of German-speaking cantons, given that migration streams across linguistic borders are far smaller than within linguistic areas.
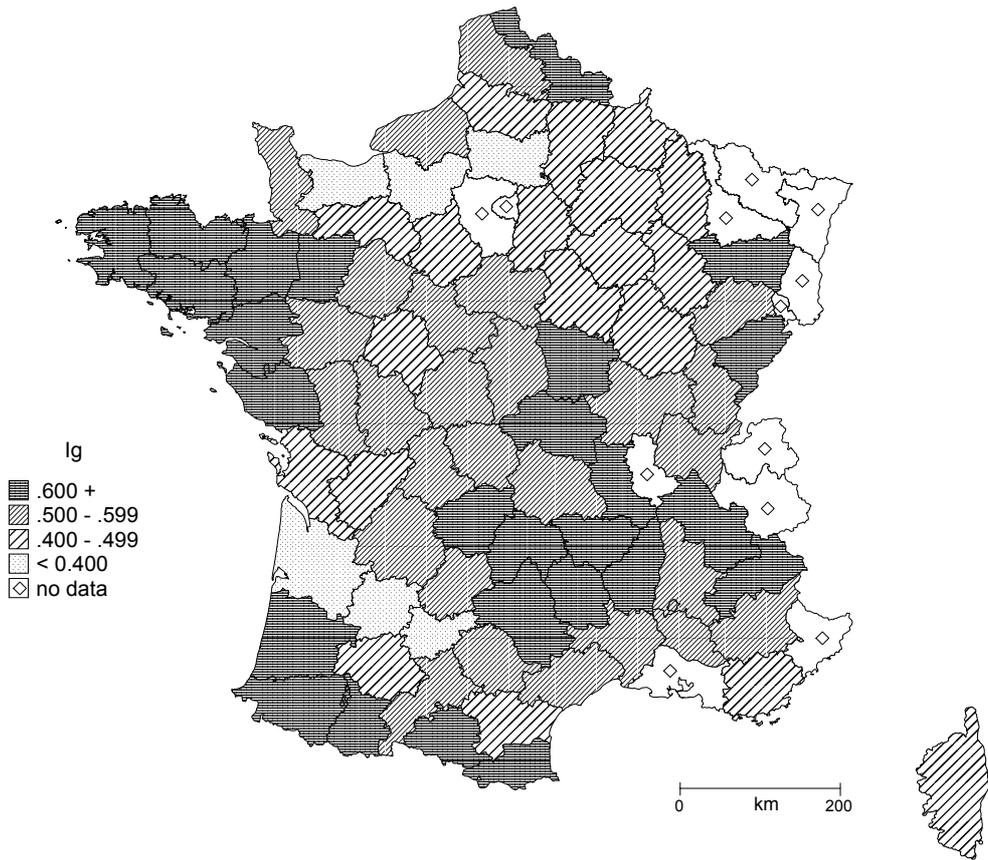
A. Religious opposition to 1791 Constitution (prêtres réfractaires)
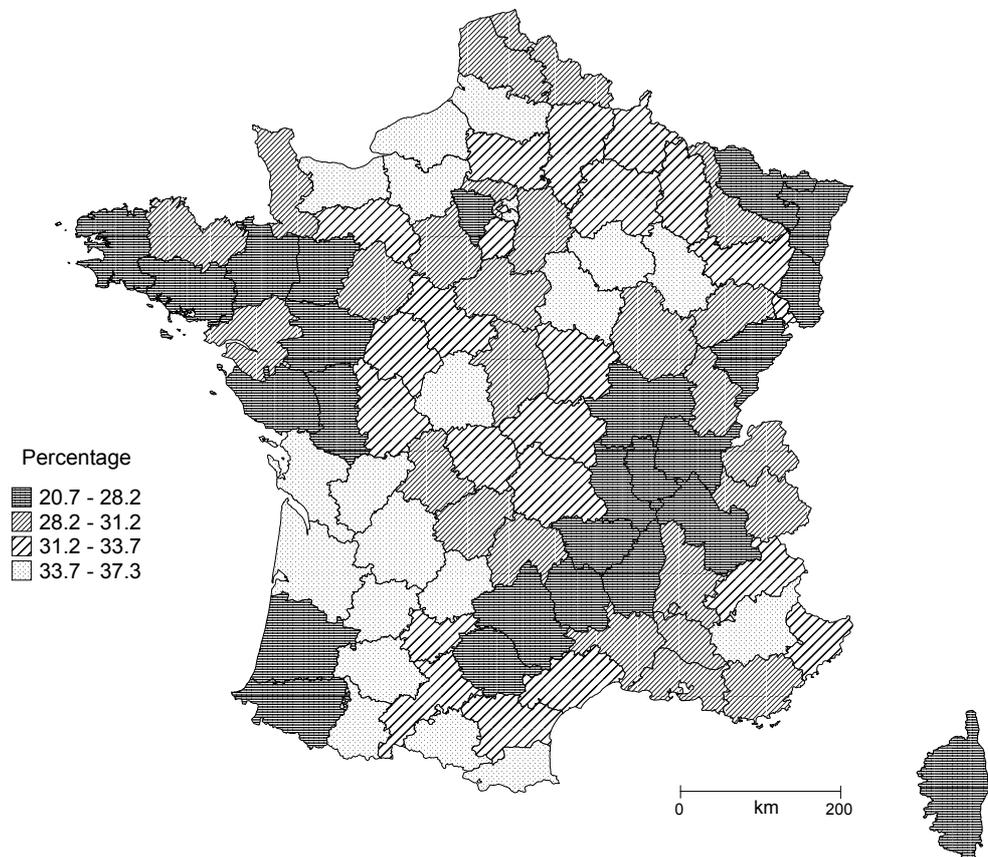   Source: T. Tackett, reprinted in Le Bras & Todd, 1981

Percentage prêtres réfractaires

- ▨ > 75 %
- ▨ 55 - 75 %
- ▨ 35 - 55 %
- ▨ < 35 %
- ◇ no data

0   km   200
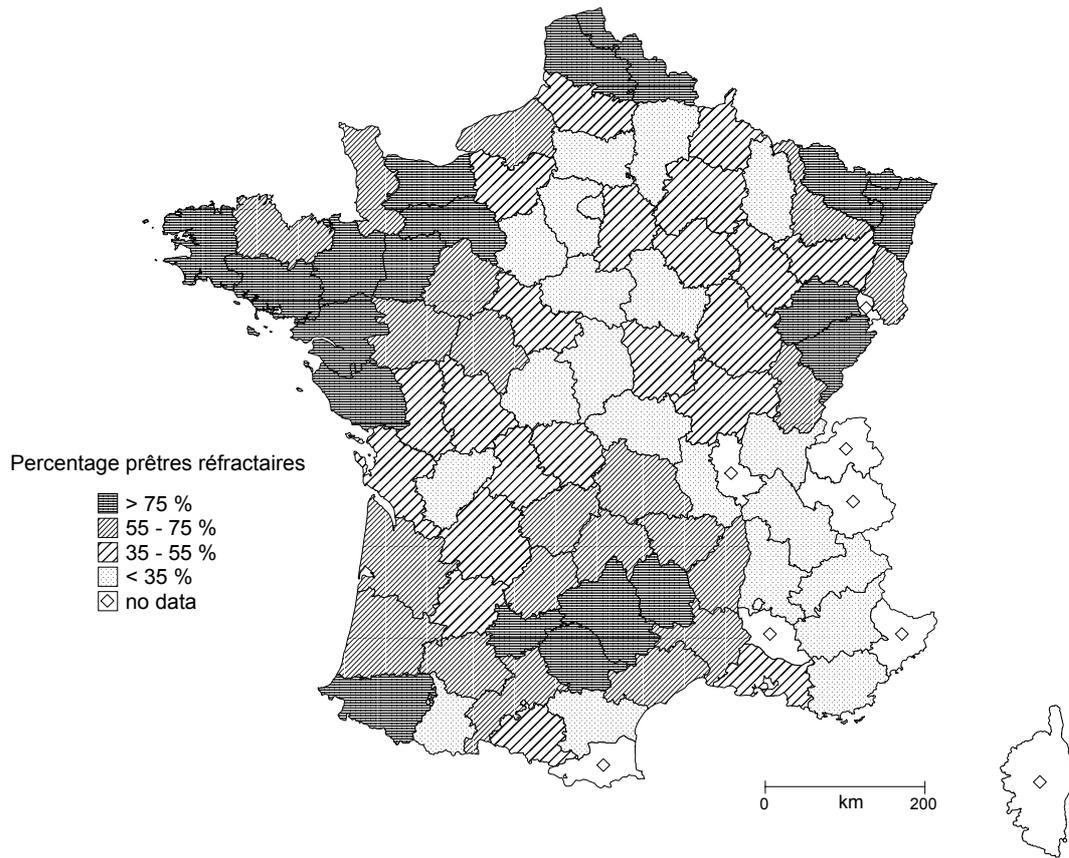
B. Sunday Mass attendance 1960-70 in rural parts of départements (population 18+)
   Source: R. Boulard, reprinted in Le Bras & Todd, 1981

Percentage attending

- ▨ > 42 %
- ▨ 28 - 42 %
- ▨ 15 - 28 %
- ▨ < 15 %
- ◇ no data

0   km   200
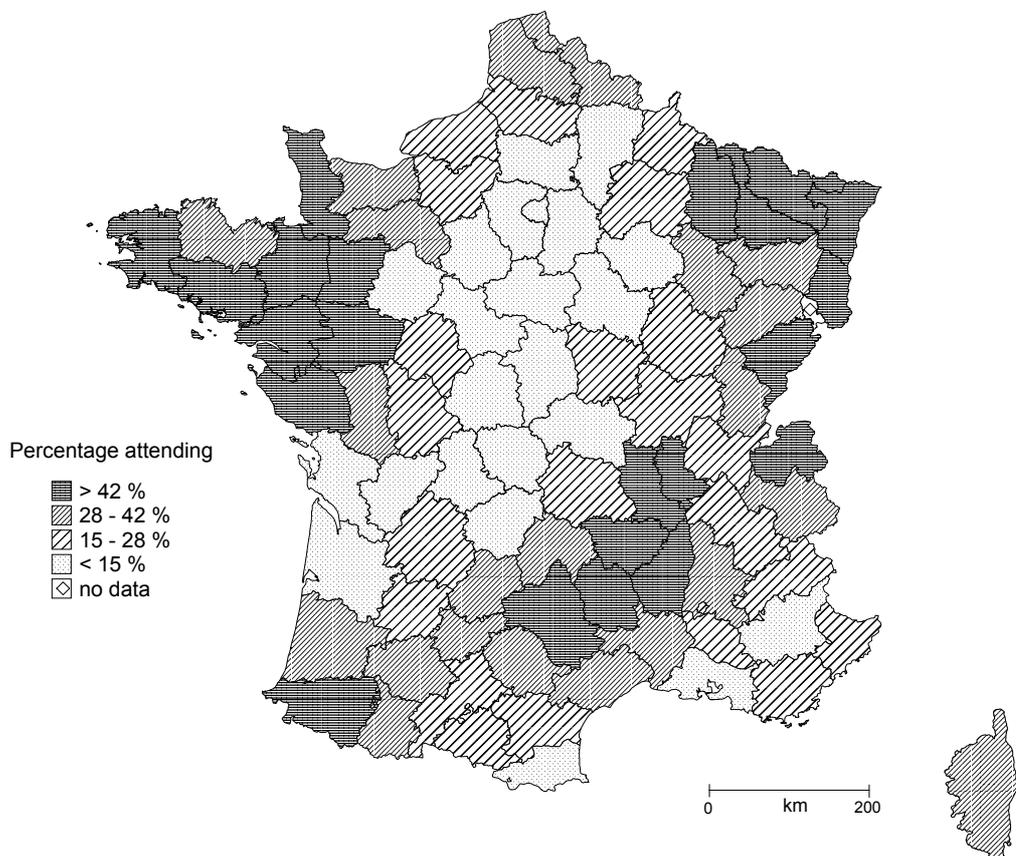
C. Level of marital fertility, 1831 (Coale's index Ig)
   Source: E. van de Walle, 1971

Ig

- ▨ .600 +
- ▨ .500 - .599
- ▨ .400 - .499
- ▢ < 0.400
- ◇ no data

0   km   200

D. Births out of wedlock, 1989-91

Percentage
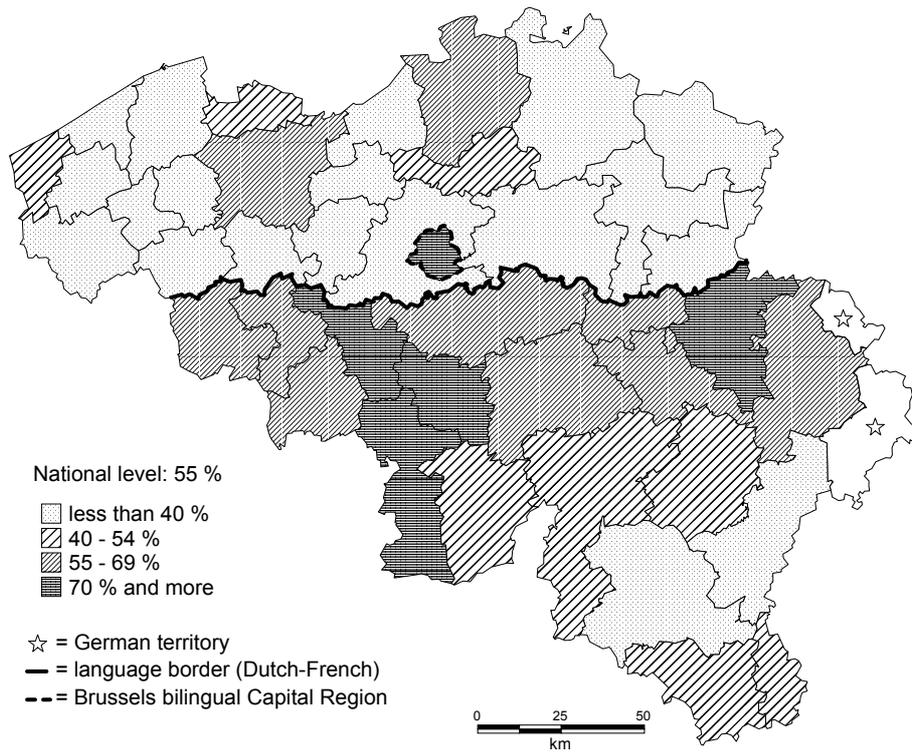
- ▨ 20.7 - 28.2
- ▨ 28.2 - 31.2
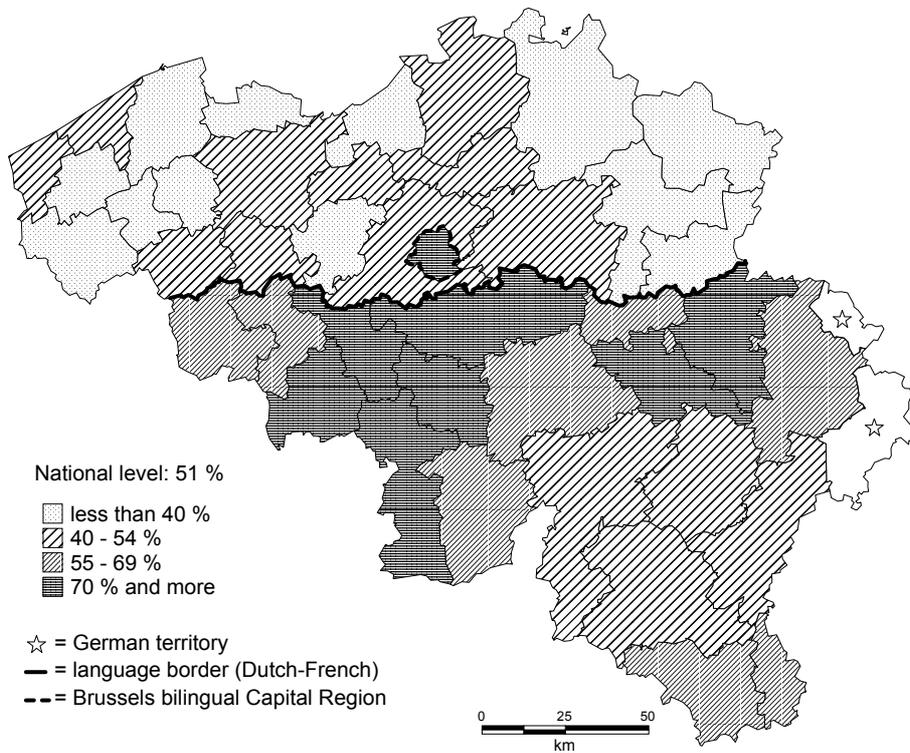- ▨ 31.2 - 33.7
- ▢ 33.7 - 37.3

0   km   200

A. <u>Speed of the marital fertility transition (1880 - 1910):</u>
   Percentage of the total marital fertility transition completed by 1910, Belgian arrondissements (NUTS 3)
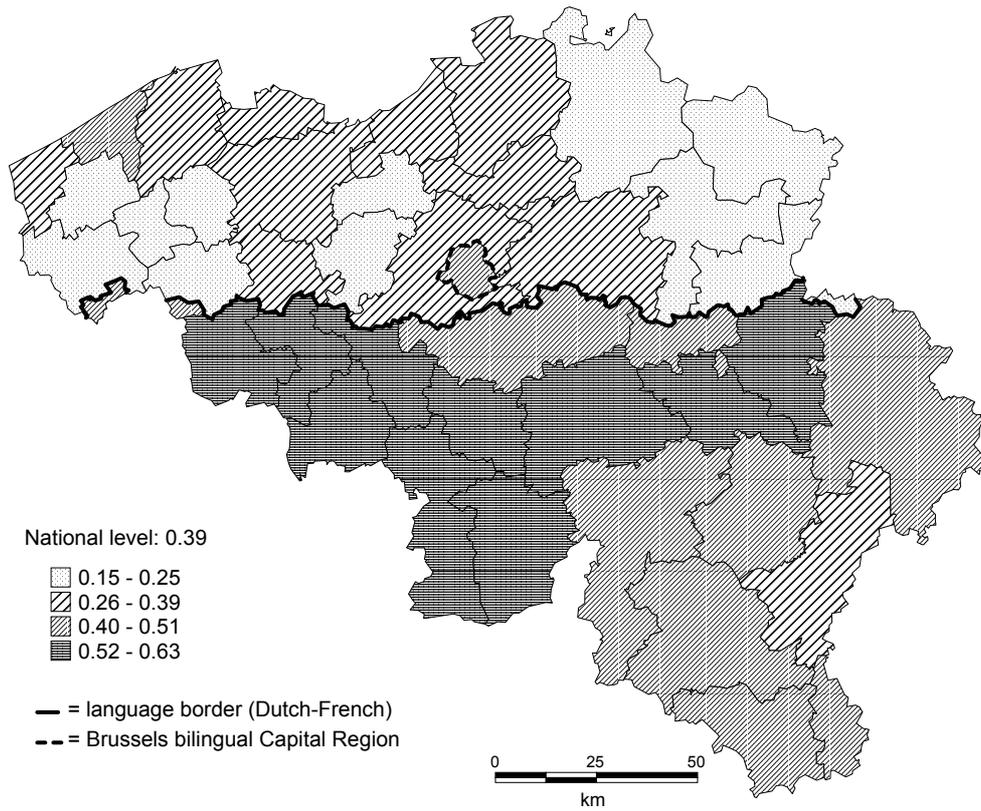
National level: 55 %

☐ less than 40 %
▨ 40 - 54 %
▧ 55 - 69 %
▤ 70 % and more

☆ = German territory
▬ = language border (Dutch-French)
▬ ▪ = Brussels bilingual Capital Region

0   25   50
km

B. <u>Secularization (1919):</u>
   Percentage votes for Socialist, Liberal and Communist parties in 1919, Belgian arrondissements (NUTS 3)

National level: 51 %

☐ less than 40 %
▨ 40 - 54 %
▧ 55 - 69 %
▤ 70 % and more

☆ = German territory
▬ = language border (Dutch-French)
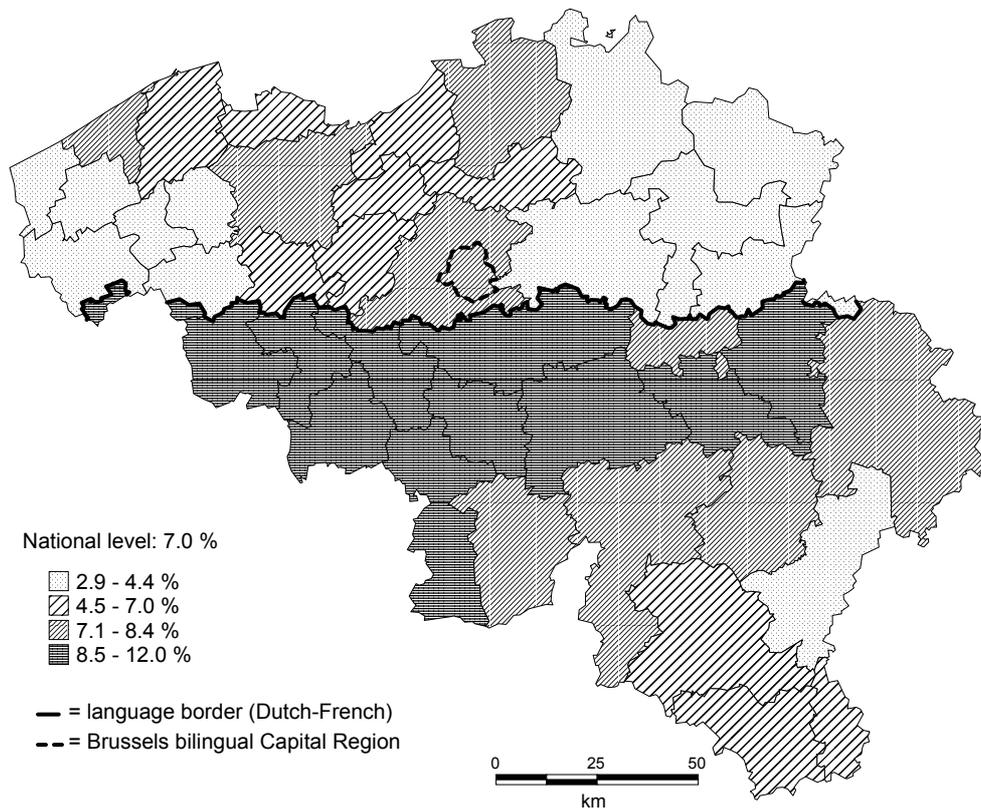▬ ▪ = Brussels bilingual Capital Region

0   25   50
km

C. Births out of wedlock (1992):
Indirectly age structure standardized index of extramarital fertility for unmarried women, Belgian arrondissements (NUTS 3)
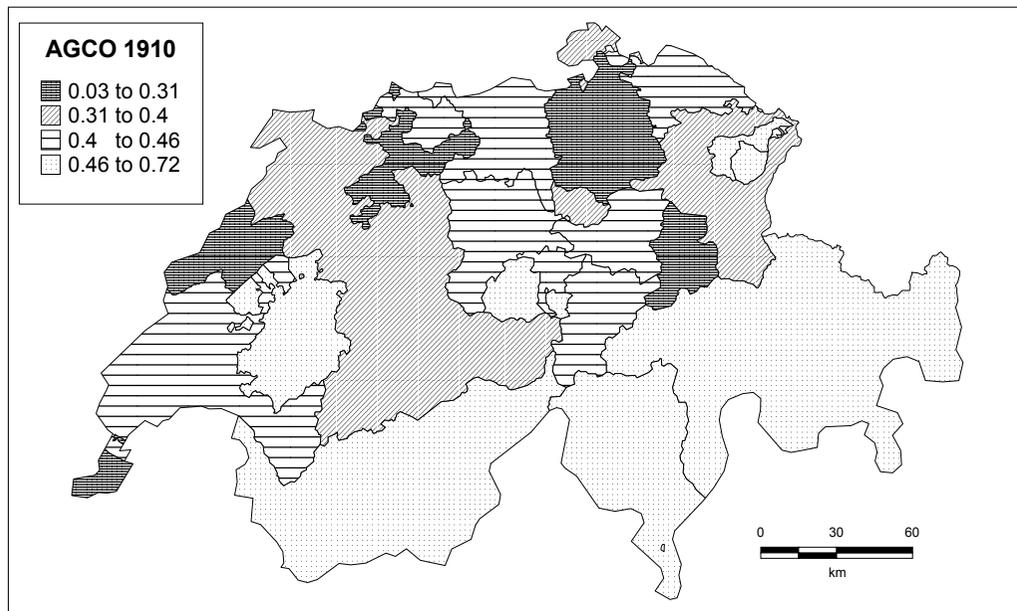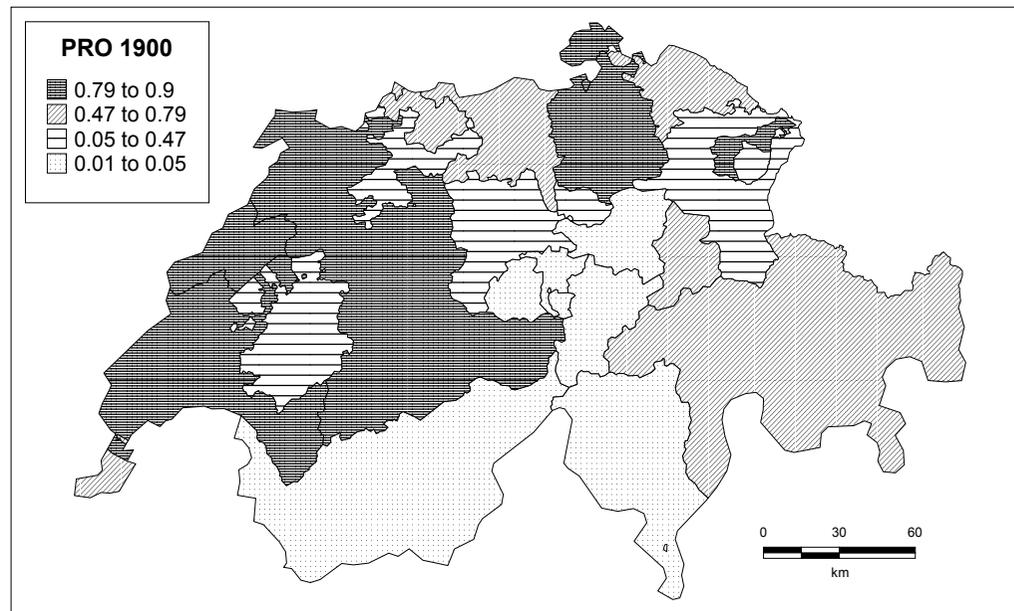

National level: 0.39

- 0.15 - 0.25
- 0.26 - 0.39
- 0.40 - 0.51
- 0.52 - 0.63

━ = language border (Dutch-French)
- - = Brussels bilingual Capital Region

0   25   50
km

D. Unmarried cohabitation (1991):
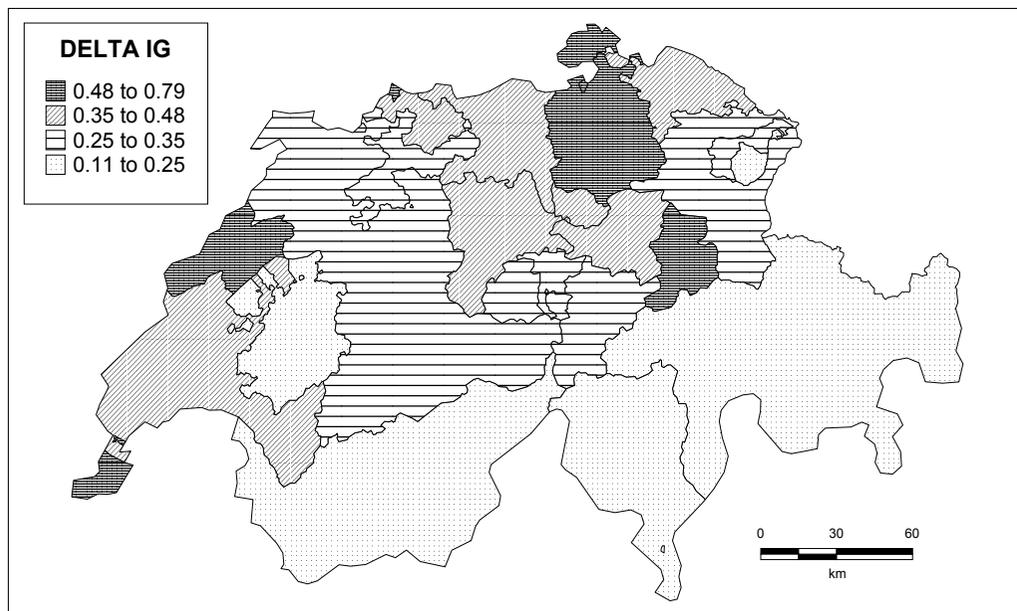Percentage cohabiting among all women in age group 25-29, census of 1991, Belgian arrondissements (NUTS 3)

National level: 7.0 %

- 2.9 - 4.4 %
- 4.5 - 7.0 %
- 7.1 - 8.4 %
- 8.5 - 12.0 %

━ = language border (Dutch-French)
- - = Brussels bilingual Capital Region

0   25   50
km

(a) Proportion of male labour force in agriculture & cottage industries, 1910

AGCO 1910

▦ 0.03 to 0.31
▨ 0.31 to 0.4
▤ 0.4 to 0.46
▨ 0.46 to 0.72

0   30   60
km

(b) Proportion Protestant, 1900

PRO 1900

▦ 0.79 to 0.9
▨ 0.47 to 0.79
▤ 0.05 to 0.47
▨ 0.01 to 0.05

0   30   60
km

(c) Proportion of total marital fertility decline realised before 1910

DELTA IG

▦ 0.48 to 0.79
▨ 0.35 to 0.48
▤ 0.25 to 0.35
▨ 0.11 to 0.25

0   30   60
km

(d) Proportion of votes for 6 secularised parties, 1919 and 1922 elections

VOTE 1919

▦ 0.39 to 0.64
▨ 0.3 to 0.39
▤ 0.11 to 0.3
▨ 0   to 0.11

0   30   60
km
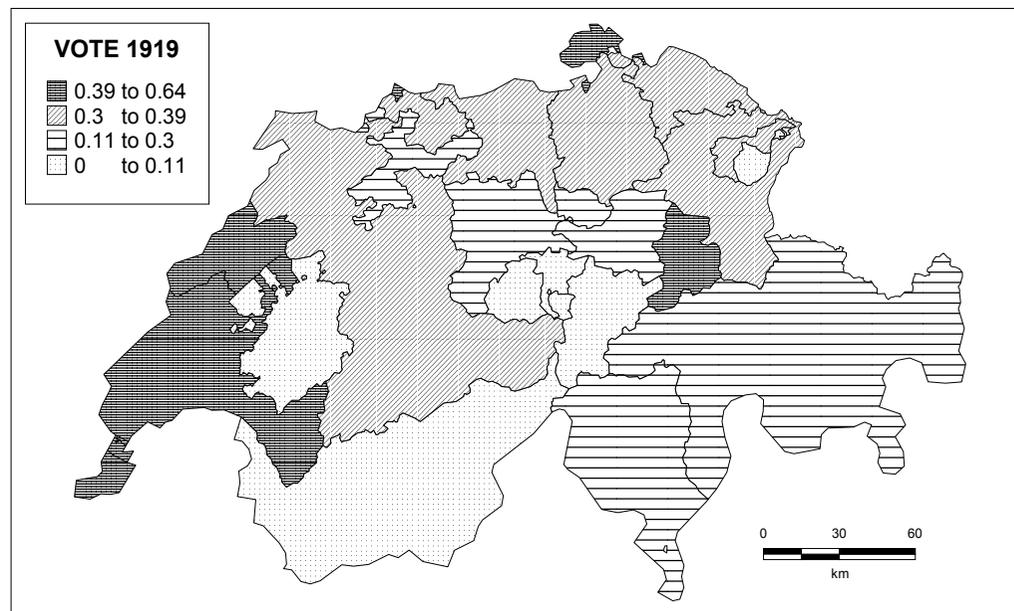
(e) Pro liberalisation abortion legislation, referendum 1978

REF 1978

- ▤ 0.56 to 0.79
- ▨ 0.37 to 0.56
- ▤ 0.25 to 0.37
- ▫ 0.07 to 0.25

0   30   60
km

(f) Divorced women per 100 married women, 1970

DIV 1970

- ▤ 5 to 10
- ▨ 4 to 5
- ▤ 3 to 4
- ▫ 1 to 3

0   30   60
km
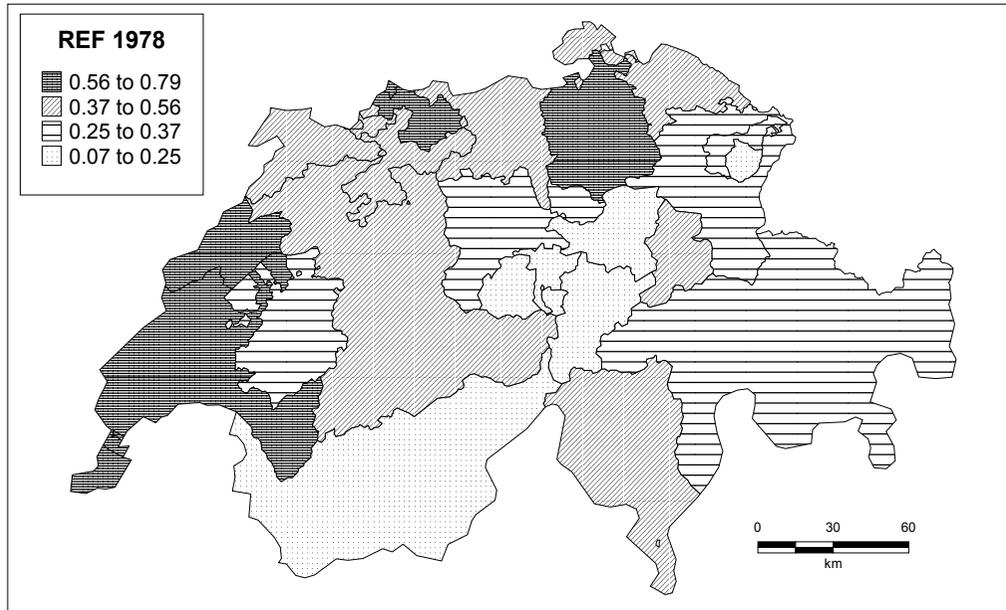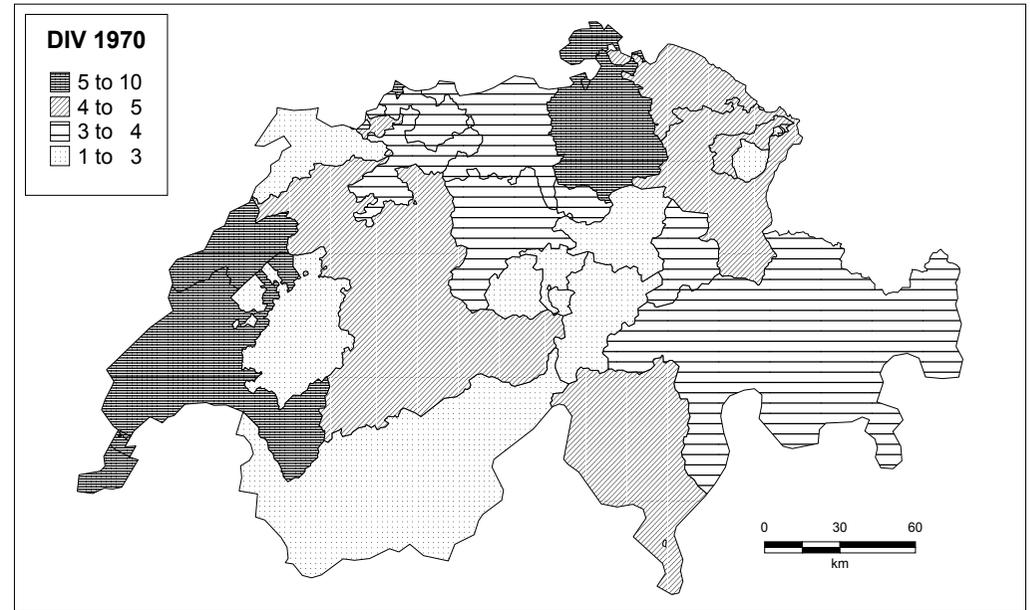
(g) Cohabiting women 25-29 per 100 women in a union, 1990

CHW 1990

- ▤ 21.5 to 25.5
- ▨ 17   to 21.5
- ▤ 15.8 to 17
- ▫ 9.4 to 15.8

0   30   60
km
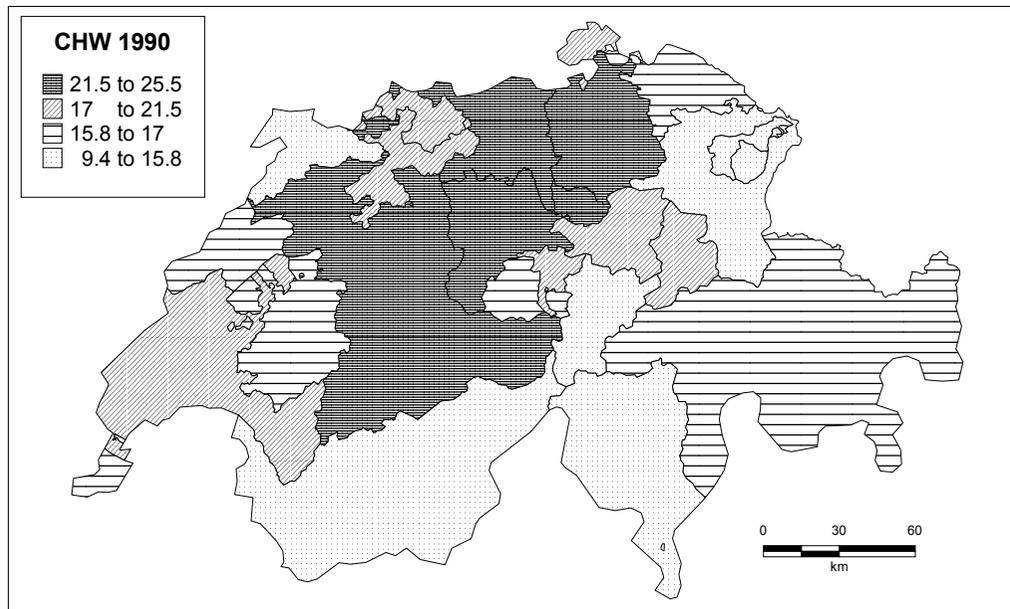
(h) Proportion of non-marital births, 1999

NMB 1999

- ▤ 0.11 to 0.15
- ▨ 0.09 to 0.11
- ▤ 0.08 to 0.09
- ▫ 0.05 to 0.08

0   30   60
km