Cohabitation in Brazil: Historical Legacy and Recent Evolution

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ABSTRACT

The paper makes use of IPUMS micro-data of successive Brazilian censuses since 1970 and of multi-level logistic regression to document the effects of individual and contextual covariates on the incidence of cohabitation among young women, age 25-29. Not only levels of cohabitation for 136 Brazilian meso-regions are investigated, but also the differential pace of the rise of this phenomenon since the 1970s. In addition, also the changes in educational profiles over time for successive cohorts are considered in greater detail. The results indicate that historical regional patterns still clearly prevail after controls for all individual characteristics, and that the rise in cohabitation occurred in all regions and all social strata, be it at slightly different paces. White and Catholic meso-regions are catching up, and only urban areas exhibit a slower pace of change. In other words, substantial contextual effects have to be added to the individual level ones. These findings are consistent with the interpretation that a new "layer" of cohabitation inspired by a "second demographic transition" has been added on top of the pre-existing and still persistent historical spatial pattern. The findings also indicate that, despite a major de-stigmatization of cohabitation, the "willingness factor", i.e. religious and cultural acceptability, is still playing a major differentiating role in the various Brazilian social strata and regions.

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1. Introduction.

As in the European sphere, also major and similar demographic transitions have taken place in many Latin American countries. Brazil is no exception. Its population is terminating its fertility transition and is even on the brink of sub-replacement fertility (TFR=1.80 in 2010), its divorce rate has been going up steadily for several decades in tandem with falling marriage rates (Samara 1987, Covre-Sussai and Matthijs 2010), and cohabitation has spread like wildfire (Rodriguez-Vignoli 2005, Esteve et al. 2012a).These have all been very steady trends that have persisted through difficult economic times (e.g. 1980s) and more prosperous ones (e.g. after 2000) alike. There is furthermore evidence from the World Values Studies in Brazil that the country has also been experiencing an ethical transition in tandem with its overall educational development, pointing at the de-stigmatization of divorce, abortion, and especially of euthanasia and homosexuality (Esteve et al. 2012a). These are all features that point in the direction of a so called "Second demographic transition"(SDT) as they have taken place in the wider European cultural sphere[i] and are currently unfolding in Japan and Taiwan as well (Lesthaeghe 2010).

In what follows, we shall solely focus on the rapid spread of unmarried cohabitation as one of the key SDT ingredients. In doing so, we must be aware of the fact that Brazil has always harboured several ethnic subpopulations that have maintained a tradition of unmarried cohabitation. By 1970, these were definitely minorities, and Brazil then ranked among the Latin American countries with the lower levels of cohabitation (cf. Esteve et al. 2012a). Brazil was in the same league as Uruguay, Argentina, Chile and Mexico in this respect. Nevertheless, given an older extant tolerance for cohabitation which was probably larger than in the other four countries just mentioned, we have to take this historical "baseline pattern" fully into account when assessing the recent trends[ii].

In much of the work that follows, we shall concentrate on women in the age group 25-29. At that age virtually all women have finished their education and they have also chosen a number of options concerning the type of partnership, the transition into parenthood, and employment. Furthermore, the analysis is also restricted to women 25-29 who are in a union, and percentages cohabiting are calculated for such partnered women only. Near the end, however, we shall illustrate that the cohabitation pattern continues well beyond that age group.

The analysis is novel in the sense that it includes a much more detailed spatial analysis involving 136 Brazilian meso-regions instead of the classic 26 states (+ the Federal District of Brasilia). This finer geographical grid also permits us to elucidate the weight of the "historical legacy" to a greater extent. For the rest, the cross-sectional analysis for the year 2000 is built along the classic multi-level design, with effects being measured of both the individual characteristics and of the contextual ones operating at the meso-regional level (see also Covre-Sussai and Matthijs 2010). But even more important is the availability of several measurements over time, thanks to the IPUMS data files with large micro-data samples of the various censuses [iii]. This allows for an analysis of changing educational profiles, spatial patterns, and overall levels over time, and solidly steers us away from erroneous extrapolations and interpretations drawn from single cross-sectional differentials.[iv]

2. The historical legacy.

As is the case of several other Latin American countries and all Caribbean ones, also Brazil has a long history of cohabitation (Smith 1956, Roberts and Sinclair 1978 for Caribbean; Samara 1987, Borges 1994, Beierle 1999, Holt 2005, Covre-Sussai and Matthijs 2010 for Brazil). However, the historical roots for the various types of populations are quite distinct. The indigenous, Afro-brazilian, and white populations (either early Portuguese colonizers or later 19th and 20th Century European immigrants) have all contributed to the diverse Brazilian scene of marriage and cohabitation. A brief review of these contributions will elucidate why the historical roots are of prime importance.

In the instance of the American *indigenous populations*, ethnographic evidence shows that they did not at all adhere to the group of patriarchal populations with diverging devolution of property through women. As argued by J. Goody (1976), populations that pass on property via a dowry or an inheritance for daughters (i.e. populations with "diverging devolution" of family property via women) tend to stress premarital chastity, control union formation via arranged marriages, have elaborate marriage ceremonies, and reduce the status of a married woman within the husband's patriarchal household. Moreover they tend toward endogamous marriage (cross-cousin preference) or to caste or social class homogamy. Through these mechanisms the property "alienated" by daughters can still stay within the same lineage or clan or circulate within the same caste or social class. Populations that are hunter-gatherers or who practice agriculture on common community land, have fewer private possessions, no diverging devolution of property via dowries, no strict marriage arrangements or strict rules regarding premarital or extramarital sex. Instead, they tend to be more commonly polygamous with either polygyny or polyandry, have bride service or bride price instead of dowries, and practice levirate or even wife-lending. The dominance of the latter system among American natives can be gleaned from the materials brought together in Table 1. This table was constructed on the basis of the 31 ethnic group references contained and coded in the G.P. Murdock and D.R. White "Ethnographic Atlas", and another 20 group specific descriptions gathered in the "Yale Human Areas Relation Files" (eHRAF). Via these materials, which refer mainly to the first half of the 20th Century, we could group the various populations in broader ethnic clusters and geographical locations, and check the presence or absence of several distinguishing features of their unions.

Of the 41 *native Indian groups* mentioned in these ethnographic samples, only one Mexican population had an almost exclusively monogamous marriage pattern, whereas all the others combined monogamy with polyandry often based on wife-lending, occasional polygyny associated with life cycle phases (e.g. associated with levirate), more common polygyny, or serial polygyny in the form of successive visiting unions. In the instance of the 21 Brazilian native populations in the sample (both forest and dry areas) the patterns of monogamy combined with polyandry or occasional polygyny are the dominant ones. For 35 native groups we have also information concerning the incidence of consensual unions and/or extramarital sex. In only 6 of them these features were rare. Also for the Brazilian groups the modal categories point at consensual unions being common. Furthermore, none have a dowry, which implies that the feature of diverging devolution is absent. Hence, compared to their European colonizers, these populations are located on the other side of the "Goody divide". As expected, they have the opposite pattern in which the prospective groom or the new husband has to render services to his in-laws or pay a certain sum of money to his wife's kin. In a number of instances, there was also a custom of women or sister exchange in marriage between two bands or clans, and there were also instances with just gift exchanges or no exchanges at all. And finally, mentions of elaborate marriage ceremonies were only found among the references to Mexican or Central American indigenous groups, whereas the others had marriages with a simple ritual only, and often had a "marriage" as a gradual process rather than a single event.

Table 1: Distribution of 51 ethnic populations according to selected characteristics of their marriages and sexual unions.

Populations	Dominant type of union					Consensual unions and/or Extramarital sex		
	Monogam. Only	Monog + polyandry	Monog +occas. Polygamy	Monog + common polyg.	Monog + visiting unions	Universal	Moderate	Occas./uncom
Mexican/Centr. Ame. Indian (9)	1	3	2	1	2	2	2	2
Amazone/Orinoco Indian (9)	0	1	7	1	0	3	3	0
Mato Grosso, Braz. Highlands, Gran Chaco (12)	0	5	6	1	0	5	1	2
Andes Indian (11)	0	1	6	4	0	3	1	2
New world Black&mixed (8)	0	0	2	0	6	7	0	0
European or upper class (2)	2	0	0	0	0	0	2	0
TOTAL (N=51)	3	10	23	7	8	20	9	6

Populations	Marriage Mode				Marital ceremony	
	Bride price/Bride serv.	Women/sister exchange	None/gifts exch.	Dowry	Elaborate	Simple/none
Mexican/Centr. Ame. Indian (9)	5	0	0	0	3	1
Amazone/Orinoco Indian (9)	6	3	0	0	0	1
Mato Grosso, Braz. Highlands, Gran Chaco (12)	7	0	2	0	0	1
Andes Indian (11)	7	3	2	0	0	2
New world Black&mixed (8)	2	0	1	0	-	-
European or upper class (2)	0	0	0	1	2	0
TOTAL (N=51)	27	6	5	1	5	5

The story for the *New World black* populations is of course very different, since these populations were imported as slaves. As such they had to undergo the rules set by their European masters, or, when freed or eloped, they had to "reinvent" their own rules. When still in slavery, marriages and even unions were not encouraged by the white masters, given the lower labor productivity of pregnant women and mothers and the difficulty of selling married couples compared to individuals. Moreover, for as long as new imports remained allowed and cheap, there was little interest on the part of the owners in the natural growth of the estates' slave population. The "reinvented" family patterns among eloped or freed black populations were often believed to be "African", but in reality there are no instances where the distinct West African kinship patterns and concomitant patterns of social organization are reproduced (strict exogamy, widespread gerontocratic polygyny). Instead, socioeconomic constraints lead to visiting unions, in which a male partner stays in the family for as long as he contributes financially or in kind to the household expenditures and where the children of successive partners stay with their mother (see for instance Scott 1990 for Pernambuco and Silva et al 2012 for the countryside of Sao Paulo). Not surprisingly, diverging devolution is equally absent

among the New World black and mixed populations reviewed by our two ethnographic samples. Only in this regard do they follow the pattern of non-Islamized West-African populations. Hence, the pattern that developed among the New World black population is essentially conditioned by slavery and the plantation economy, much more so than by a truly African heritage.

The *white colonial settler population or the upper social class* by contrast adhered to the principles of the European marriage ("Spanish marriage", "Portuguese *nobres* marriage") being monogamous, based on diverging devolution and hence with social class as well as preferred families endogamy. However, this European pattern was complemented with rather widespread concubinage, either with lower social class women or slaves (see for instance Freyre 2000 [1933] for Northeastern sugar-cane farmers, Borges 1994 and Beierle 1999 for the Bahia colonial upper class in Brazil, and Twinam 1999 for several Spanish speaking populations). Children from such unions in Brazil could easily be legitimized by their fathers via a simple notary act (Borges 1994).

The data of Table 1 should of course be taken as an illustration, and not as an exhaustive classification of Latin American ethnic populations. But, in our opinion, they clearly demonstrate that "marriage" as Eurasian societies know it, often must have been either a fairly irrelevant construct to both indigenous and New World black populations, or later on, just an ideal or a formal marker of social success.

So far, we have only dealt with the historical roots of the diverse patterns of union formation. To this one has to add the influence of institutional factors and immigration.

The Catholic Church and the states generally tended to favor the "European" marriage pattern, but with quite some ambiguity. First, the Catholic clergy, and especially those in more distant parishes, did not observe the celibacy requirement that strictly. Second, many Christian and pre-Colombian practices were merged into highly syncretic devotions. The promotion of the Christian marriage was mainly the work of the religious orders. At present, that promotion is vigorously carried out by the new Evangelical churches which have been springing up all over the continent since the 1950s, and most visibly in Brazil.

Also the role of the various states is often highly ambiguous. Generally, states copied the European legislations of the colonizing nations and hence "officially" promoted the classic European marriage, but more often than not this was accompanied by amendments that involved the recognition of consensual unions as a form of common law marriage and also of equal inheritance rights for children born in such unions. In Brazil, more specifically, Portuguese law had already spelled out two types of family regulations as early as the 17th Century (Philippine Code of 1603), namely laws pertaining to the property of notables (*nobres*) who married in church and transmitted significant property, and laws pertaining to the country folk (*peões*) who did not necessarily marry and continued to live in consensual unions (Borges, 1994).
Furthermore, it should also be stressed that, while the European marriage pattern was highly valued by the upper classes, many central governments were often far too weak to implement any consistent policy in favor of the European marriage pattern among the lower social strata (Samara 1987). Add to that the remoteness of many settlement and the lack of interest of local administrations to enforce the centrally enacted legislation.

It would be a major mistake, however, to assume that this "old cohabitation" was a uniform trait in all Latin American countries (Quilodran 1999). Quite the opposite is true. In many areas late 19th Century and 20th century mass European immigration (Spanish, Portuguese, Italian, German) to the emerging urban and industrial centers, as well as to some rural areas[v] of the continent reintroduced the typical Western European marriage pattern with monogamy, highly institutionally regulated

marriage, condemnation of illegitimacy and low divorce. As a consequence the European model was reinforced to a considerable extent and became part and parcel of the urban process of *embourgeoisement*. This not only caused the incidence of cohabitation to vary widely geographically and in function of the ethnic mix, but also accentuated the gradient by social class and educational level: the higher the social class, the lower the incidence of cohabitation and the higher that of marriage. This negative cohabitation-social class gradient is obviously essentially the result of these historical developments and long term forces, and not the outcome of a particular economic crisis or decade of stagnation (e.g. the 1980s and 1990s).

Nowadays, (since 1996) cohabitation is recognized by law as a 'type of marriage' in Brazil. Cohabiters have the option to formalize the relationship through a contract with the purpose of delimitation of property division. In case of dissolution, the content of the contract if it exists is followed. In the absence of a formal contract, if one of the partners proves that they cohabited with intention to constitute family or proves that they lived "as family" this partnership can be considered by the judge as a type of marriage, with almost the same property right guarantees of a couple that choose to get married instead of to cohabit (Brazil, 2002). Furthermore, as of May 2013, Brazil is on the brink of fully recognizing gay marriage as the third and largest Latin American country, i.e. after Argentina and Uruguay which recognized it in 2010. The Brazilian Supreme Court ruled that gay marriages have to be registered in the same way as heterosexual marriages in the entire country, but there is still stiff opposition in Congress coming from Evangelical politicians.

3. Socioeconomic and cultural development

As stated before, for the Brazilian upper classes the institutions of marriage and the family were historically constructed based on hierarchic, authoritarian and patriarchal relationships, under influence of the Catholic morality. Conversely, men were 'allowed' to have relationships with women from different social and ethnic groups, following different rational and moral codes (Freyre 2000 [1933]). At the same time, while this patriarchal model described by Freyre serves as a very good illustration of families of sugar cane farmers in the Northeast region of Brazil during the colonial period (16th to the end of 19th centuries; Samara 1987, 1997), there was a noteworthy variance in terms of family compositions and roles over different social strata and regions of the country (i.e. Souza et al. 2001; Samara 1997, 1987; Corrêa 1993; Almeida 1987). It is now well understood by Brazilian social scientists that the influence of the Catholic Church on family life, the patriarchal model of family and gender relations inside the family, all vary considerably across the Brazilian regions, and that this variation is related to both socioeconomic and cultural differences (Souza et al. 2001; Samara 2002). The Brazilian anthropologist Darcy Ribeiro (1997) suggests the following distinctions for the 5 major areas.

Firstly, the North and Northeast regions have the higher proportions of mixed race populations (pardos: mainly the mixture of native indigenous, European and African descendents), with 68 and 60 percent of self-declared *pardo* in 2011, respectively (IBGE 2013). It was among the upper classe in the Northeast that the family model, described by Freyre (2000 [1933]) as patriarchal and hierarchic, was more visible. According to Ribeiro (1997), both regions are characterized by a social system stressing group norms and group loyalty .

Secondly, until to the second half of the 19th century, the groups in the Southeastern and Southern regions were formed by the union of the Portuguese colonizer with indigenous people and some African slaves. During the colonial period it was from the city of Sao Paulo that expeditions embarked in order to explore the mines found in the countryside and to spread the Brazilian population beyond the Tordesillas line. During this period, while husbands went to the countryside, wives took care of children and of the household as a whole. This system fostered less hierarchic family relationships

than the ones observed in the North (Souza et al. 2001, Samara 1997, 1987, Corrêa 1993, Almeida, 1987). Today, the descendents of these early settlers in the Southeast and South share their regions with social groups composed of descendents of the large European immigration of the 19th and 20th centuries, especially Italians and Germans. These historical roots explain the contemporary majority of self-declared whites in the South and Southeast (78 and 56 percent respectively – IBGE 2013).

The last sub-culture identified by Ribeiro (1997) includes people from the inland part of the Northeast and, particularly, from the more rural Central-west area. The Central-West region contains the most equilibrated division of ethnicities in Brazil with 43 percent of whites, 48 percent of pardos, 7.6% of African descent and about 1% of indigenous and Asiatic descent (IBGE 2013). The development of this region started later compared to the coastline and was accelerated, in part, when the country's administrative capital was transferred from Rio de Janeiro to Brasília (Distrito Federal) in 1960. Although this region was relatively unsettled up to that time, the creation of a new city (Brasília was built between 1956 and 1960) spurred population growth and created more heterogeneity and educational contrasts. The rural areas of the Central-West still hold small populations devoted to subsistence agriculture (Ribeiro 1997).

The current socioeconomic development of Brazilian regions is related (among other factors) to different processes of occupation and industrialization. Industrialization and urbanization started earlier and happened faster in Southern regions than in the Northern ones (Guimarães Neto 2011). With the investments realized in recent years, the gap in socioeconomic development among Brazilian regions is reduced, but still evident (IBGE, 2012, p.168). The North and Northeast regions are the poorest and least developed in the country. These are regions where between 24.9 and 17.6 percent of the population were living in extreme poverty, in comparison to 11.6, 6.9 and 5.5 percent of the population in the Central-West, Southeast and South (Ipeadata 2010). These two regions also have the lowest values on the Human Development Index of 0.75 and 0.79 for the North and Northeast respectively, whereas the South, the Southeast and Central-West have values of 0.85 and 0.84 (BCB 2009).

In demographic terms, there is also a significant variation between Brazilian regions. Vasconcelos and Gomes (2012) demonstrated that the demographic transition happened at a different tempo and to a different degree in the five regions. While the Southeast, South and Central-West are found in a more advanced stage of the demographic transition, the North and Northeast showed higher levels of fertility and mortality, as well as a younger age structure (Vasconselos and Gomes 2012). In addition, Covre-Sussai and Matthijs (2010) found that the chances of a couple living in cohabitation instead of being married differ enormously if Brazilian regions and states are compared, and that this variance persists even when socioeconomic and cultural variables are considered.

4. The basic geography of cohabitation and its major conditioning factors.

From the brief picture sketched above, we essentially retain 3 dimensions that would capture the essence of the historical legacy: (i) the ethnic composition, (ii) the religious mix, (iii) the social class diversity and educational differentials. To this we also added a "frontier" dimension since large parts of western Brazil were settled much later in the 20th Century, and a considerable segment of their population is born outside the region. These dimensions were operationalized using the census definitions as provided by the IPUMS files. Table 2 gives the definitions of the categories and the mean of the proportions in the 137 meso-regions as of 2000.

Table 2: Distribution of characteristics of 137 meso-regions, measured for women 25-29 as of 2000

Variables	Category	Average of proportions in 137 Meso-regions
Cohabitation	Married	0.615
	Cohabitation	0.385
Religion	Catholic	0.760
	Protestant Lutheran, Baptist	0.036
	Evangelical	0.140
	No Religion	0.049
	Others	0.015
Race	White	0.510
	Brown Brazil (Pardo)	0.420
	Black	0.051
	Indigenous	0.011
	Others	0.009
Education	Less than secondary	0.769
	Secondary	0.200
	University	0.031
Migrant	Sedentary (Residence in State of birth)	0.815
	Migrant (Residence in other State)	0.185

The expected direction of the effects of these dimensions is clear for the racial and religious composition: cohabitation should be lower among Catholics and especially Protestant and Evangelicals than among the others, and the same should hold for whites who traditionally frowned upon cohabitation as lower class behavior. The effect of the frontier should be the opposite as settlements are often scattered and social control weaker than elsewhere. The role of large cities is however more ambivalent. On the one hand urban life too allows for greater anonymity and less social control, but in the Latin American context, the urban reference group is the wealthier white bourgeoisie and its essentially European pattern of union formation. Then, marriage carries a strong connotation of social success. Moreover, we expect that a more detailed analysis of the patterns among large cities warrants attention as their histories are very diverse. We shall therefore measure each of these metropolitan effects together with those of all the other meso-regions in a subsequent contextual analysis.

Table 3 gives the share of women aged 25-29 currently in a union (i.e. married or cohabiting) who are cohabiting according to their religious, educational, racial and migration characteristics, as of the census of 2000. As expected, Protestants (here mainly Lutheran and Baptist) and Evangelicals have by far the lowest proportions cohabiting (see also Covre-Sussai and Matthijs 2010). Catholics and "other" (here including a heterogeneous collection of Spiritist and of Afro-brazilian faiths) have a similar incidence, but also markedly lower levels than the category "no religion". The racial distinctions are completely as expected, with whites and "others"(i.e. mainly Asians) having the lower proportions cohabiting, the indigenous and black populations the highest, and the mixed "Pardo" population being situated in between. The educational gradient is still very pronounced with only 17 percent of partnered university graduates in cohabitation against 44 percent among partnered women with primary education only and 39 percent for the whole of Brazil. Finally, the incidence of cohabitation among migrants is indeed higher than among non-migrants, but the difference is only 6 percentage points.

Table 3: Proportions cohabiting among women in a union 25-29 with the given characteristic, 2000

Variables	Category	Proportion cohabiting
Religion	Catholic	0.408
	Protestant Lutheran, Baptist	0.232
	Evangelical	0.276
	No Religion	0.627
	Others	0.400
Race	White	0.324
	Brown Brazil (Pardo)	0.469
	Black	0.536
	Indigenous	0.591
	Others	0.384
Education	Less than secondary	0.446
	Secondary	0.264
	University	0.172
Migrant	Sedentary (Residence in State of birth)	0.380
	Migrant (Residence in other State)	0.440
Total Brazil 2000		**0.393**

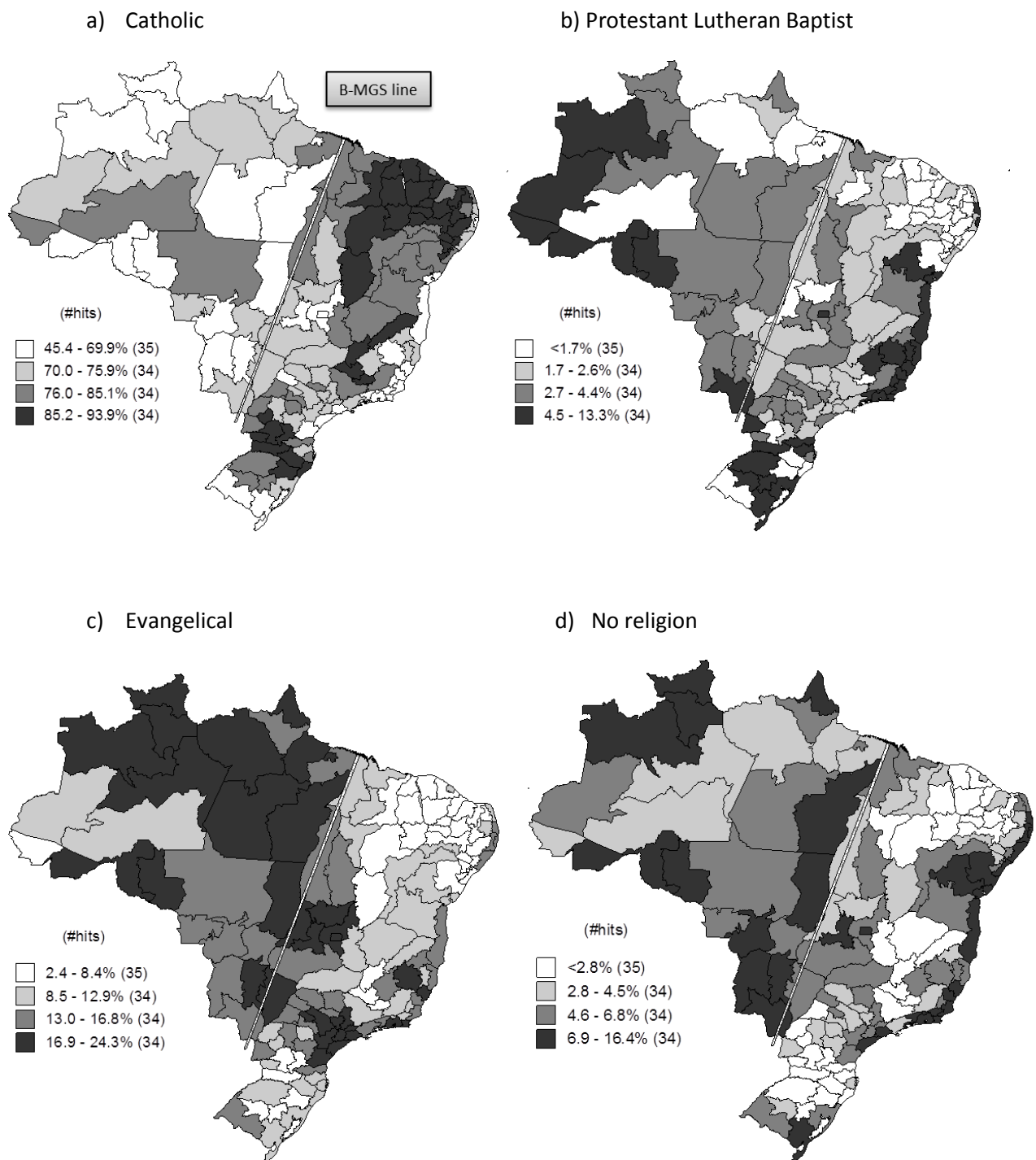The maps of these characteristics are given below (Maps 1 through 4) using quartiles.

As far as cohabitation is concerned, there are three major zones in Brazil. Firstly, the areas west of the "Belem – Mato Grosso do Sul" line (see map 1, dotted line marked "B-MGS") virtually all fall in the top 2 quartiles, and the majority even in the highest quartile with more than 48 percent cohabiting among partnered women 25-29. This is also a huge area with low population densities (see Map A2 in the appendix). The second region with similarly high percentages cohabiting stretches along the Atlantic coast, from Sao Luis in the North to Porto Alegre in the South. However, it should be noted that Rio de Janeiro is only in the second quartile. The third zone forms an inland North-South band, with a majority of meso-regions having percentages below the median (36%). There are, however, a few notable exceptions such as the Rio Grandense regions along the Uruguay border, the Baiano hinterland of Salvador de Bahia (former slave economy), and the broader area of the Federal capital of Brasilia (large immigrant population). By contrast, the zones in this hinterland band in the lowest quartile, i.e. with less than 29 % of partnered women 25-29 in cohabitation, are Pernambuco to Tocantins stretch in the North, Belo Horizonte and the whole Minas Gerais in the center, and most of the "white" South. Virtually all of the remaining areas of the band are in the second quartile.

Map 1: Proportions cohabiting among women 25-29 in a union; Brazilian meso-regions 2000
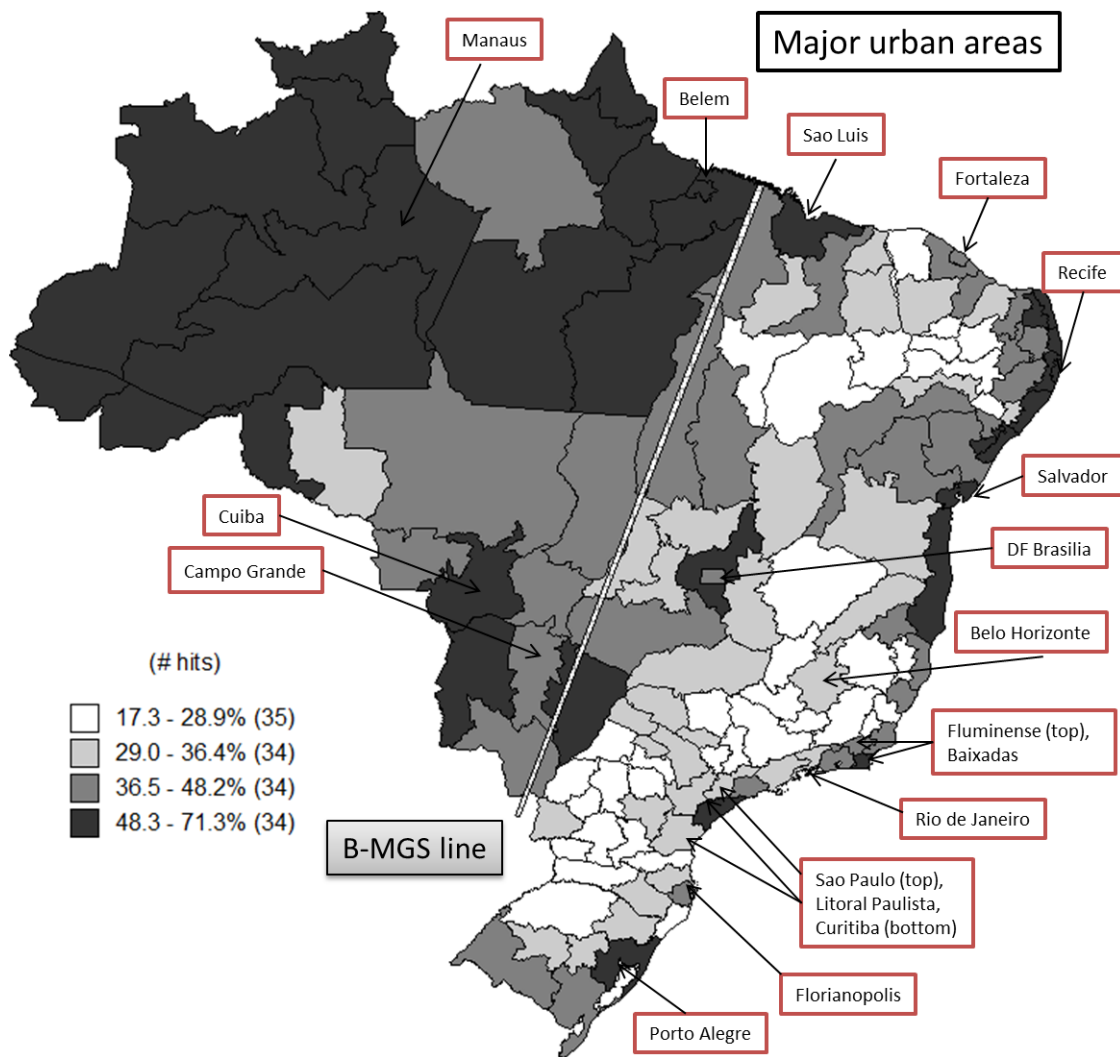
The spatial patterning of religious groups is given in the 4 sections of Map 2. The Catholics are a large majority (over 85 %) in 3 areas east of the "Belem – Mato Grosso do Sul" (B-MGS) line: (i) a broad area centered around Pernambuco, Piaui and Eastern Baiana, (ii) a stretch in central Minas Gerais, and (iii) much of the Catarinense and Paranaense in the South. To the west of the B-MGS line there is an important concentration of Evangelicals (upper quartile = 21 to 35 %) and no religion or other religion (upper quartile = 8 to 18 %), whereas Spiritists and Afro-brazilians are rare. To the east of the SL-MG line, lower proportions Catholic are compensated by Evangelicals in three smaller areas: (i) meso-regions around Brasilia,(ii) the southern Bahia, Spirito Santo and Rio de Janeiro coast, and (iii) central Sao Paulo. The Spiritist and Afro-brazilian group is much smaller and the upper quartile only ranges from 2 to 8 % of young women in 2000. They are predominantly found in (i) Metropolitan Recife and Salvador, (ii) the central band from Espirito Santo/Rio to the Mato Grosso, and in (iii) Florianapolis and southern Rio Grande do Sul. The group without or other religions is somewhat larger and the upper quartile reaches 6 to 18%. They are located along the Atlantic Ocean from Recife to the Paulista coast, in Brasilia and western Minas Gerais, and finally again in the Rio Grandense south.
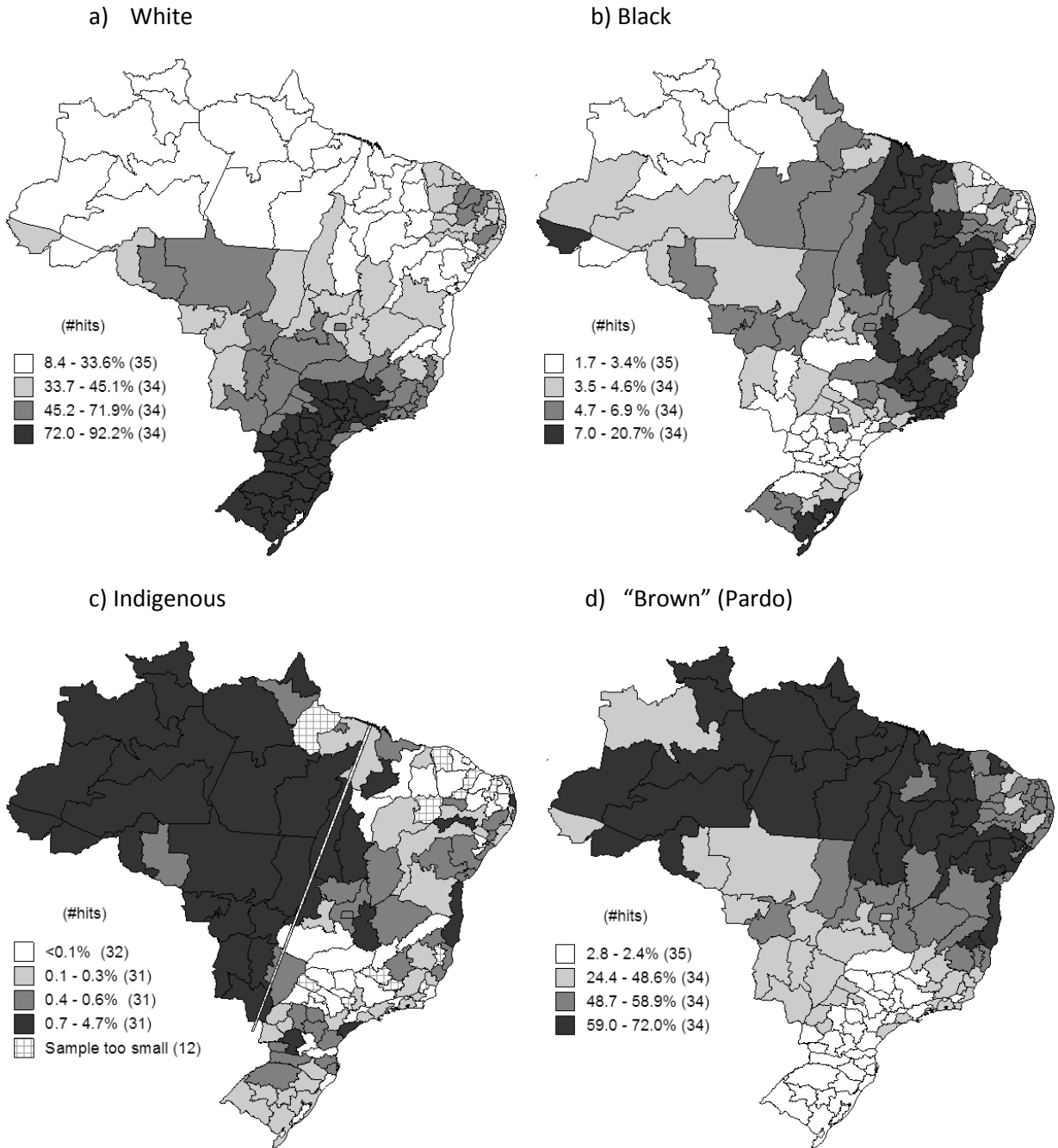
Map 2: Proportions in various religious groups, women 25-29; Brazilian meso-regions 2000

a) Catholic

b) Protestant Lutheran Baptist

B-MGS line

(#hits)

45.4 - 69.9% (35)
70.0 - 75.9% (34)
76.0 - 85.1% (34)
85.2 - 93.9% (34)

(#hits)

<1.7% (35)
1.7 - 2.6% (34)
2.7 - 4.4% (34)
4.5 - 13.3% (34)

c) Evangelical

d) No religion

(#hits)

2.4 - 8.4% (35)
8.5 - 12.9% (34)
13.0 - 16.8% (34)
16.9 - 24.3% (34)

(#hits)

<2.8% (35)
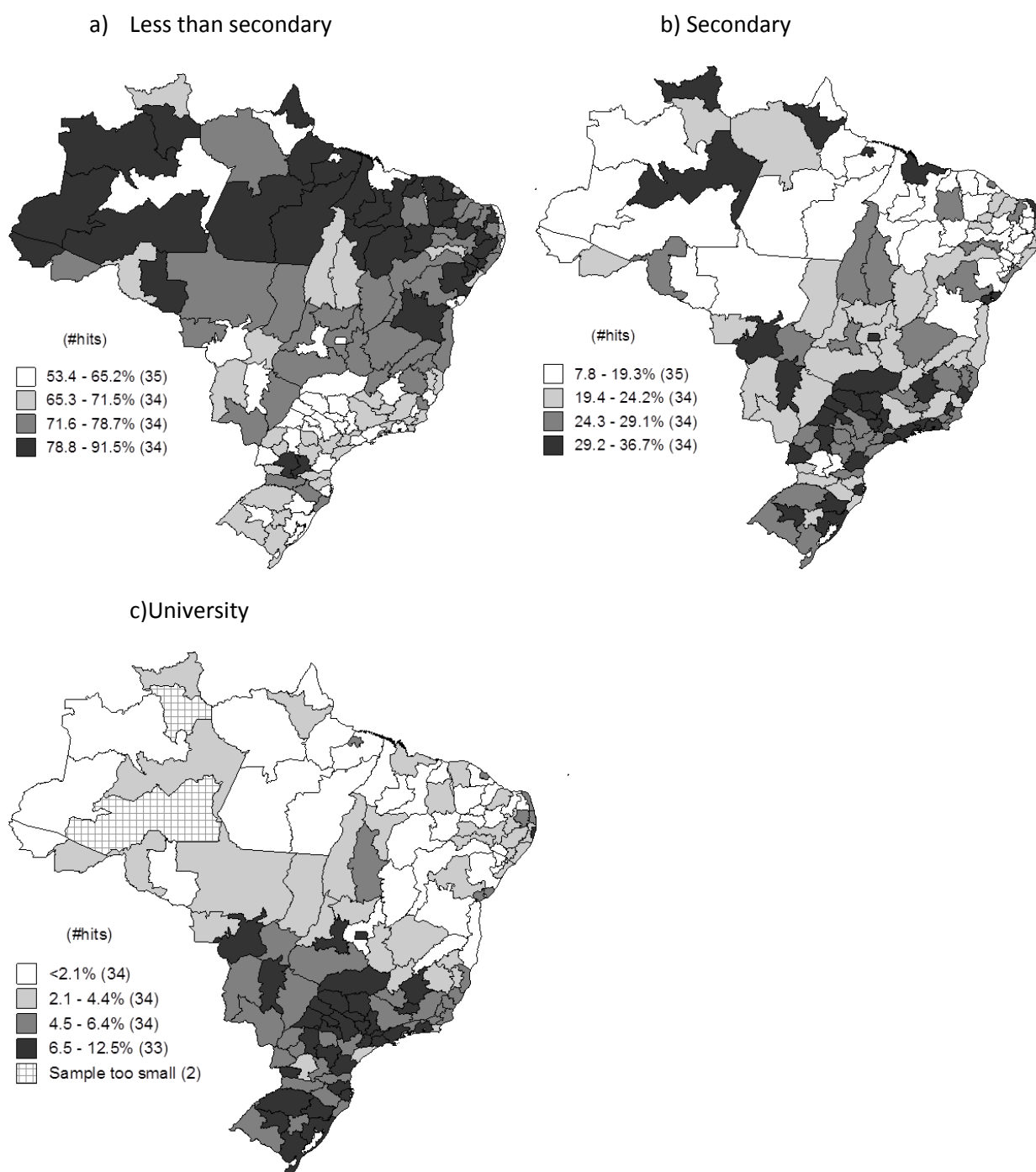2.8 - 4.5% (34)
4.6 - 6.8% (34)
6.9 - 16.4% (34)

The racial composition is presented in the 4 sections of Map 3, which immediately highlights the strong degree of spatial clustering. The white population forms a large majority of more than 70 percent in the 4 southern states of Sao Paulo, Parana, Santa Catarina and Rio Grande do Sul and in the south of Minas Gerais. The black population forms a similarly large majority in the North-East from the Sao Luis coast and running further south via an inland stretch to Sergipe, Bahia, eastern

Minas Gerais, Espirito Santo and Rio de Janeiro. Two much smaller clusters are found along the Porto Alegre coast, and at the other extremity of the country in Acre.

Map 3: Proportions in various racial categories, women 25-29; Brazilian meso-regions 2000

a)   White   b) Black

(#hits)

8.4 - 33.6% (35)
33.7 - 45.1% (34)
45.2 - 71.9% (34)
72.0 - 92.2% (34)

(#hits)

1.7 - 3.4% (35)
3.5 - 4.6% (34)
4.7 - 6.9 % (34)
7.0 - 20.7% (34)

c) Indigenous   d)   "Brown" (Pardo)

(#hits)

<0.1% (32)
0.1 - 0.3% (31)
0.4 - 0.6% (31)
0.7 - 4.7% (31)
Sample too small (12)

(#hits)

2.8 - 2.4% (35)
24.4 - 48.6% (34)
48.7 - 58.9% (34)
59.0 - 72.0% (34)

The indigenous population is very largely located to the west of the SL-MGS line, but is also to be found in scattered areas of Bahia, Minas Gerais, the Paulista coast and in eastern Parana. Finally, the important mixed race population (often referred to as "Pardo") form a majority in all the Northern regions, with the exception of the Ceara-Pernambuco-Alagoas corner. Wherever whites are a majority of over 70%, as in the South, the mixed race population obviously falls below 25 % (lowest quartile), but it is still the second largest group.

Map 4: Proportions in three education categories, women 25-29; Brazilian meso-regions, 2000

a) Less than secondary

b) Secondary

(#hits)

53.4 - 65.2% (35)
65.3 - 71.5% (34)
71.6 - 78.7% (34)
78.8 - 91.5% (34)

(#hits)

7.8 - 19.3% (35)
19.4 - 24.2% (34)
24.3 - 29.1% (34)
29.2 - 36.7% (34)

c)University

(#hits)

<2.1% (34)
2.1 - 4.4% (34)
4.5 - 6.4% (34)
6.5 - 12.5% (33)
Sample too small (2)

The three sections of Map 4 show the educational distribution. Many of the areas in the North with a majority of black, indigenous and mixed race populations also show up on the map of the population with no more than primary education. Apart from this contiguous zone of low education, including the central Baiano, there is no other area in the country that falls in this category, except again eastern Parana with a more important indigenous population. Still in the "Norte" and "Nordeste", the top quartile of secondary education mainly contains the large urban meso-regions, such as Manaus, Belem, Sao Luis, Fortaleza, Recife and Salvador, and of them only Recife makes it to

the top quartile of university level education. The story for the Center and the South is completely the opposite, with many meso-regions making it to the top quartiles of secondary and/or university education. With respect to the latter, the regional cities and the large urban areas with institutions of higher learning are standing out, in the Mato Grosso and Goias as well as in the main parts of Minas Gerais and the South. Hence, the spatial distributions of race and education show a marked degree of correlation.

5. Explaining the levels of cohabitation as of the year 2000.

The harmonized IPUMS microdata files for Brazil cover the period up to the census of 2000. The percentages cohabiting among women 25-29 currently in any union for 2010 is also available from IBGE, but not the essential individual-level covariates. Hence, the statistical models are only constructed for the year 2000 at this point. The 2000 sample used here contains just over 4.6 million women 25-29 currently in a union, which is about 6 percent of the total in Brazil.

The statistical method is that of contextual logistic regression. A very similar method was used by Covre-Sussai and Matthijs (2010), using the larger Brazilian states (see Appendix Map A1) as spatial units instead of the micro-regions used here (see Map 1). Other major differences compared to the present analysis is that these authors used a sample of couples of *all* ages, with individual characteristics being available for both men and women. Hence they could refine their categories by combining the information for each partner or spouse. In addition they have income and education as separate indicators. And given their much broader age range they also needed to include the number of children and the birth cohort of men stretching as far back as the 1920s.

Our dataset consists of individuals (women 25-29 in union) nested within meso-regions. We model the probability of a women in union to be in a cohabiting union (as opposed to married). We include explanatory variables at the individual level (e.g. education, race, religion) and at the meso-regional level (e.g. % Catholics, % whites). To this end, multilevel models recognize the hierarchical structure and are able to exploit hierarchically arranged data to differentiate the contextual effects from background effects for individuals. In particular, we use a two-level random intercept logistic regression model. Level 1 is the individual (i) and level 2 is the meso-region (j). In the random intercept model the residual variance is partitioned into components corresponding to each level in the hierarchy (i, j).

$$f(\pi_{ij}) = \beta_{0j} + \beta_1 x_{1ij}$$

$$\beta_{0j} = \beta_0 + \mu_{0j}$$

where $f(\pi_i)$ is the logit transformation of π_i, which is the probability that $y_i = 1$ (the binary response for the ith individual); β_0 is the intercept; β_1 is the effect parameter for variable x_1. In this model the intercept consists of two terms: a fixed component, β_0, and a random effect at level j (meso-region) μ_{0j}. The model assumes that departures from the overall mean (μ_{0j}) are normally distributed with mean zero and variance of σ_{u0}^2. Therefore, meso-regions are not introduced into the models using fixed effects (i.e. including dummy variables for each of the 136 meso-regions in Brazil). Instead, we use the σ_{u0}^2 parameter to measure the variance across meso-regions. In the models that follow we will use this variance as an indicator of the degree to which the introduction of individual-level variables as controls is capable of reducing the differences between the meso-

regions. Normally, this variance should shrink as more and better individual-level predictors are introduced. If this is not so, then substantial spatial differences are persisting independently of the individual-level controls.

Table 4: Multilevel logistic regression results for proportions cohabiting among women 25-29 in a union, Brazil 2000. Relative risks for individual-level variables*

| Variable	Category	Model 1	Model 2	Model 3	Model 4	Model 5
	Protestant Lutheran, Baptist		0.389	0.395	0.429	0.430
Religion	Evangelical		0.490	0.472	0.437	0.436
	No religion		2.062	2.002	1.909	1.919
	Others		0.843	0.870	1.116	1.123
	Catholic		1.000	1.000	1.000	1.000
	Black			2.270	1.970	1.983
	Brown Brazil			1.672	1.473	1.468
Race	Indigenous			2.461	2.112	2.137
	Others			1.156	1.188	1.194
	White			1.000	1.000	1.000
	Less Secondary				4.068	4.020
Education	Secondary				1.721	1.719
	University				1.000	1.000
Migrant	Residence in another State					1.273
	Residence in State of birth					1.000
	Variance left between meso-regions	**0.320**	**0.342**	**0.299**	**0.336**	**0.322**

*The table with the logistic regression coefficients is given in the appendix. All regression coefficients were significant at the 0.0001 level.

In Table 4 the results are given in the form of relative risks (RR) of cohabiting relative to a reference category (value of unity) of the individual-level determinants. Model 1 is the "empty" model, but it estimates the variance between de meso-regions when there are no controls for the individual-level covariates. We start out with introducing religion and then add in race, and subsequently education and migrant status of the individuals. As can be seen, the relative risks are very stable, and all in the expected direction. Compared to Catholics, the risk of cohabiting is much smaller among partnered Protestants and Evangelicals (RR=0.43 and 0.44 in model 5). By contrast, the risk is higher among "Others" (including Spiritists and Afro-brazilians (1.12), and much higher among persons without religion or of another faith (1.92). Compared to partnered whites, indigenous and black women are roughly twice as likely to cohabit (2.14 and 1.98). The Pardo women are having risks that are more modest (RR=1.47), and other races resemble the whites (1.19). Not surprisingly, the educational gradient is steep, with lower educated partnered women being 4 times more likely to cohabit than partnered women with a university education (RR=4.02). Partnered women 25-29 with secondary education are also more likely to cohabit compared to those with a tertiary education (1.72). Finally, as expected, residence in another state increases the relative risk, but only modestly so (RR=1.27).

None of these findings come as a surprise given the historical context of patterns of partnership formation in Brazil, and our findings are entirely in line with those of Covre-Sussai and Matthijs. Given the much broader age group used in their sample, they are also capable of illustrating a very marked rise in relative risks of cohabitation over marriage for each successively younger generation.

The more striking result of the analysis in Table 4 is that the variance between states is not reduced by the introduction of controls for individual-level characteristics. Clearly there are robust effects strictly operating at the regional level that continue to carry a substantial weight. Another way of showing this is to plot the meso-region effects (i.e. random part of the intercept) of Model 5 with all individual level predictors against the "empty" Model 1 effects without these controls. This scattergram is presented in Figure 1 and it clearly shows that controls for all individual-level variables do not change the map of cohabitation versus marriage among women 25-29.

Figure 1: Plot of the meso-region effects of the model with all individual-level variables against those of the "empty" model 1
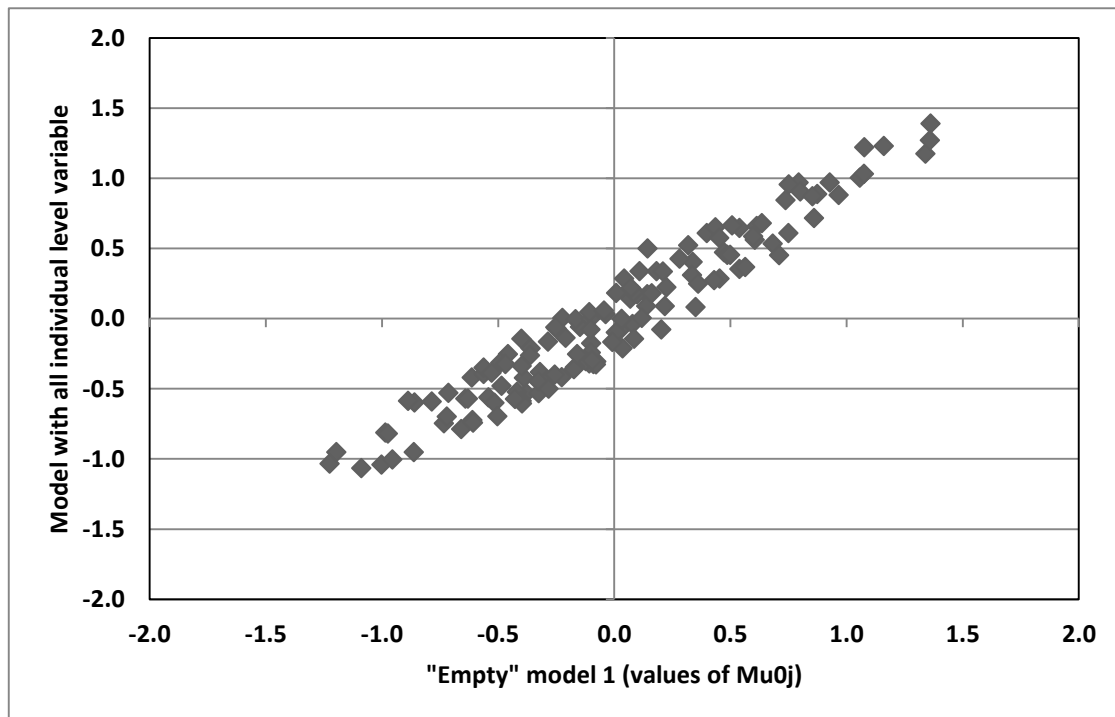
In order to elucidate these regional effects, a Model 6 was tested with a typology of meso-regional characteristics being added. After exploring various possibilities, we settled for a contextual variable made up of 8 categories of combinations of the following 3 variables: percentage Catholic in the meso-region, the percentage white and the percentage with more than secondary education. Each of these were dichotomized and split at their median. The median values for the 137 meso-regional values were 0.77 for proportions Catholic, 0.46 for proportions white and 0.15 for proportions with at least secondary education. The variables are respectively indicated by C, W and S. We use upper cases if the meso-region value is equal or above the median, and lower cases if it is below. The 8 categories then range from CWS to cws, with all the other combinations in between, and together they form this meso-regions typology. The results with this contextual information being added to the regression are given below in Table 5 (Model 6).

Table 5: Multilevel logistic regression results for proportions cohabiting among women 25-29 in a union, Brazil 2000. Relative risks for type of meso-region (Model6)*

Catholic – White – Secondary (**CWS**)	1.000 (reference.)
Catholic – No White –No Secondary (**Cws**)	1.115
Catholic – No White - Secondary (**CwS**)	2.114
Catholic -White –No Secondary (**CWs**)	1.128
No Catholic – No White - No Secondary (**cws**)	2.403
No Catholic –No White - Secondary (**cwS**)	3.666
No Catholic –White - No Secondary (**cWs**)	1.348
No Catholic - White - Secondary (**cWS**)	1.580
Individual level variables: same relative risks as in Model 5	
Variance among meso-regions	**0.193**

*Relative risks for individual variables same as in Model 5. Regression coefficients are reported in the appendix Table A2.

In Model 6 the relative risks for the individual-level variables are identical to those of Model 5, but the addition of the 8 meso-regional types clearly reduces the variance of the random parts of the intercept, roughly from 0.30 to 0.19. This means that residence in any of the types helps in accounting for a woman´s status as being in cohabitation rather than in a marriage. Taking CWS as the reference category, residence in the cwS meso-regions increases the relative risks the most (3.67), followed by residence in the cws and the CwS regions (RR=2.41 and 2.12). A more modest effect is noted for the cWS and the cWs regions, whereas the Cws and the CWs meso-regions are not different from the CWS reference category.[vi]

These 8 combinations can be reduced to 4:

1. the "very low" group of meso-regions which are all more strongly Catholic and who are made up of three types (Cws + CWS + CWs, or CW+Cws) and which have relative risks in Model 6 comprised between 1.000 and 1.126,
2. a "moderately low" group which is white and less Catholic (cWs + cWS, or simply cW) with relative risks of 1.353 and 1.580,
3. a "moderately high" group with two non-white types (CwS and cws) and relative risks of 2.120 and 2.408 respectively,
4. and finally a "very high group" with the cwS type only and a relative risk of 3.673.[vii]

These 4 types are reproduced on Map 5, with the number of meso-regions in each of the categories mentioned between parentheses.

Map 5: The four types of meso-regions distinguished according to their relative risk of cohabitation for partnered women 25-29, 2000 (legend: see text)
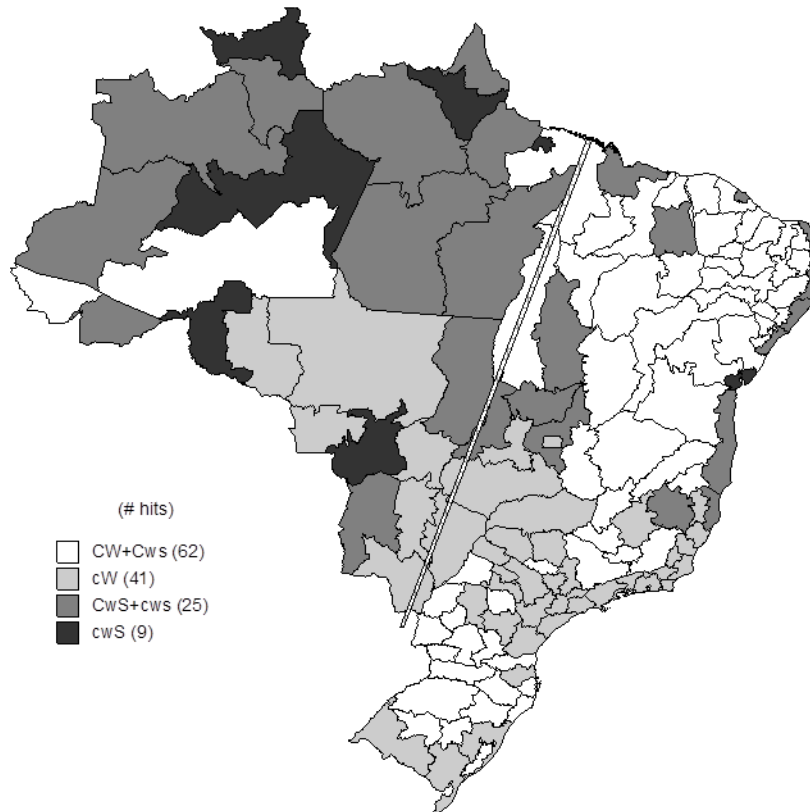
The main demarcations are again clear. The highest group cwS is composed of mainly urban areas to the west of the B-MGS line or along the Atlantic coast. The same holds for the next highest group with a predominantly non-white population. At the other end of the distribution, the lowest group of more strongly Catholic meso-regions stands out, with the CW combination in the south and the Cws combination in the North-East.

The conclusions concerning the differentials in levels of cohabitation among partnered women 25-29 as of the year 2000 are, first and foremost, that the historical patterns are still very visible, and that the racial and religious contrast are by far the two dominant ones. Moreover, these characteristics are operating both at the individual and the contextual level and in a reinforcing fashion. In other words, whites in predominantly white or Catholic meso-regions are even less likely to cohabit than whites elsewhere, whereas non-whites in non-white or less Catholic meso-regions are much more like to cohabit than non-whites elsewhere. The force of history and its concomitant spatial patterns clearly still formed the "baseline" onto which the more recent developments are being grafted.

5. Current trends.

We are able to follow the trends in cohabitation among partnered women 25-29 for the period 1974-2010 by level of education and for the period 1980-2010 by municipality and by meso-region. These data are based on the IPUMS census samples and on IBGE data for 2010, and eloquently show the extraordinary magnitude of the Brazilian "cohabitation boom".

The evolution by education is presented on Figure 2. Since social class and education differences are closely correlated in Brazil, these percentages duly reflect the rise in cohabitation in all social strata since the 1970s.

More specifically, the 1970 results can be taken as a "historical baseline" against which the subsequent evolution can be evaluated. A rather striking feature of this initial cohabitation profile by education is that consensual unions by no means constituted the dominant union type among the lesser educated women: less than 10 percent of such women were cohabiting in 1970.[viii] This is a strikingly low figure compared to the incidence of cohabitation among such women in the northern Andean countries and in many of the Central American ones. It reveals that, apart from northern coastal towns and areas to the west of the B-MGS line, cohabitation was not at all a common feature, not even among the lower strata of the population. But, from the mid-70s onward, there is a remarkably steady trend to much higher levels. Initially, the rise is largest among the women with no more than partial or complete primary education, who both exceed the 20 % level by 1991. After that date, however, women with completed secondary education are rapidly catching up, and shortly thereafter women with a university education follow as well. The overall result by 2010 is clear: the educational gradient of cohabitation remains negative throughout, but the levels shift up in a very systematic fashion among all social strata. Cohabitation is now no longer the prerogative of the lesser educated women. And by extension, it is no longer an exclusive feature of the non-white population either. Moreover, it is most likely that the upward trend will continue in the near future, and that the negative education gradient will become less steep as well.

**Figure 2: Percent cohabiting among partnered women 25-29 by education, Brazil 1970-2010**
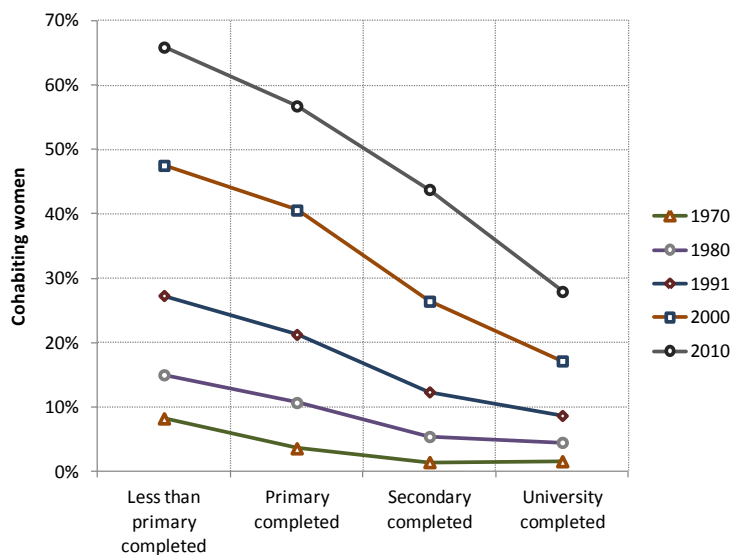
Source : IPUMS and IBGE data, compilation by A. Lopez-Gay.

The spatial pattern is equally worthy of further investigation. In Figure 3 we have ordered the meso-regions according to their percentage of partnered women 25-29 in cohabitation as of 1980. That plot shows that a large majority of meso-regions did not have levels of cohabitation exceeding 20 % as of that date, but also that the outliers exceeded 30 %. By 1990, there is a universal increase of cohabitation, but the vanguard regions of 1980 exhibit the larger increments, and several of them reach 50 %. Between 1990 and 2000, there is a further increase by on average about 15 percentage

points, and this increment is fairly evenly observed for the entire distribution of meso-regions. The vanguard areas now exceed the 60 % level, but the areas at the tail also pass the 20 % mark. The last decade, however, is characterized by a typical catching up of the meso-regions at the lower end of the distribution. For these, the increment is on average close to 20 percentage point, whereas the increment is about half as much for the vanguard regions. As of 2010 no regions are left with less than 30 % cohabitation, and the upper tail is about to reach the 80 % level.

Figure 3: Evolution of the percentages cohabiting among all partnered women 25-29 in Brazilian meso-regions, 1980-2010.
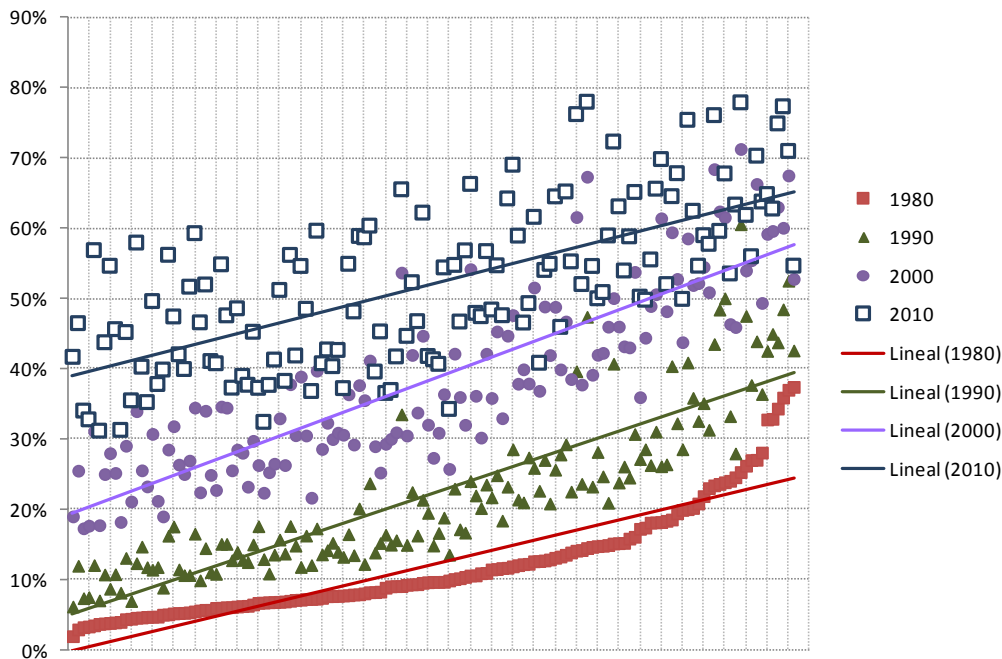
A much more detailed view is also available by municipality for the last decade, and these maps are being shown in the appendix (Maps A3). The main features are: (i) the further advancement in all areas to the west of the B-MGS line, (2) the inland diffusion from the Atlantic coast in the North, and (3) the catching up of the southern states of Rio Grande do Sul and Santa Catarina.

6. Further examination of the spatial trends in 136 meso-regions, 1980-2010.

In this section we will examine the relative pace of the change in proportions cohabiting among women in a union aged 25-29 over the 30 year period between 1980 and 2010, using the meso-regions and their characteristics as of the year 2000. To this end, the following covariates were constructed for women 25-29: (i) the percentage Catholic, (ii) the percent white, (iii) the percent with full secondary education or more, (iv) the percentage immigrants, i.e. born out-of- state, and (v) the percentage urban (Brazilian census definition). We shall also use two different measures of change. The first one is the classic exponential rate of increase, whereas the second one is a measure that takes into account that a given increment is more difficult to achieve for regions that already covered more of the overall transition to start with than for regions which at the onset of the measurement period still had a longer way to go. This measure will be denoted as "Delta Cohabitation", and it relates the gains in a particular period to the total gains that could still be achieved.

The classic rate of increase is defined as:

r30 = *ln* (Cohab 2010/Cohab 1980)

And the Delta30 measure as:

Delta30 = (Cohab 2010 - Cohab 1980)/(0.950 – Cohab 1980)

The numerator of Delta captures the actual increase in cohabitation in the observed 30 year period, whereas the denominator measures how far off the region still was at the onset from an upper maximum level, set here at 95 % cohabiting. This upper limit is chosen arbitrarily, but taking into consideration that some Brazilian meso-regions are now already at about 80 %, and that in other Latin American countries, some regions have almost universal cohabitation among women 25-29.

The outcomes of the OLS regressions are displayed in Table 6 in the form of comparable standardized regression coefficients (betas). The complete regression results are given in the appendix Table A3.

Table 6: Prediction of the increase in cohabitation among partnered women 25-29 in the meso regions of Brazil, period 1980 to 2010: standardized regression coefficients and R squared (OLS).

Covariates in 2000	*r30*	*r30 with Cohab 1980*	*Delta30*
% w. Catholic	.656 ***	.219 ***	-.146 ns
% w. White	.422 ***	.111 *	-.259 **
% w. Secondary educ.	.120 ns	.059 ns	.042 ns
% w. Migrant	.071 ns	-.025 ns	.005 ns
% w. Urban	-.317 *	-.215 *	-.369 *
% w. Cohab 1980	Not used	-.679 ***	Not used
R squared	.650 ***	.845 ***	.239 ***

As indicated by the results for r30, the highest rates of increase are found in the areas with larger Catholic and white female populations. The percentages born out-of-state and with secondary education produce no significant effects, whereas urban meso-regions exhibit slower rates of increase. The large standardized regression coefficients for percentages Catholics and Whites come as no surprise, since these areas had the lowest cohabitation incidence to start with and have the widest margins for subsequent catching up. This is indeed what is happening: when the initial levels of cohabitation measured as of 1980 are added, the standardized regression coefficients of percentages Catholic and white drop considerably, and most of the variance is explained by the level of cohabitation at the onset. The higher that level, the larger the denominator of r30, and hence the slower the relative pace of change.

 Delta30, however, corrects for this artifact by dividing by the remaining gap between the level of 1980 and the level taken as that for a "completed" transition. Regions with higher levels at the onset are now at a greater advantage and get a bonus for still completing a portion of the remaining transition. The standardized regression coefficients for Delta30 indicate that the Catholic and the white meso-regions were on average closing relatively *smaller* portions of the remaining transition, and the same was also true for urban meso-regions.

Hence, in terms of classic growth rates of cohabitation among partnered women 25-29, predominantly Catholic and white regions are exhibiting the expected catching up, but in terms of the portion covered of the amount of transition still left, these regions were not doing better than the ones which were further advanced to start with. In addition, urban meso-regions tended to move slower irrespective of the type of measurement of change. Much of this amounts to stating that the steady upward shift of the meso-regions, as depicted in Figure 3, occurred rather evenly in all types of meso-regions, with the exception of a somewhat slower transition in the urban ones. [ix]

7. The cohort profiles in Brazilian cohabitation.

The availability of measurements over time and for sufficiently large populations also permits the investigation of cohabitation profiles for both cohorts and cross-sections. This, in its turn, sheds light on the question to what extent cohabitors convert their unions into marriages as they grow older, or, conversely, stay in cohabitation for long spells in their life cycle, either with the same partner or with successive partners.

The Brazilian data are presented in Figure 4, showing the cohabitation profiles over 40 years at 5 censuses. The data are plotted by single years of age, so that cohort points can easily be followed across these 5 dates of measurement.

Figure 4: Percent cohabiting among women in a union by single years of age at 5 censuses (Brazil, 1970 to 2010), and tracks for cohorts born in 1919 to 1979.
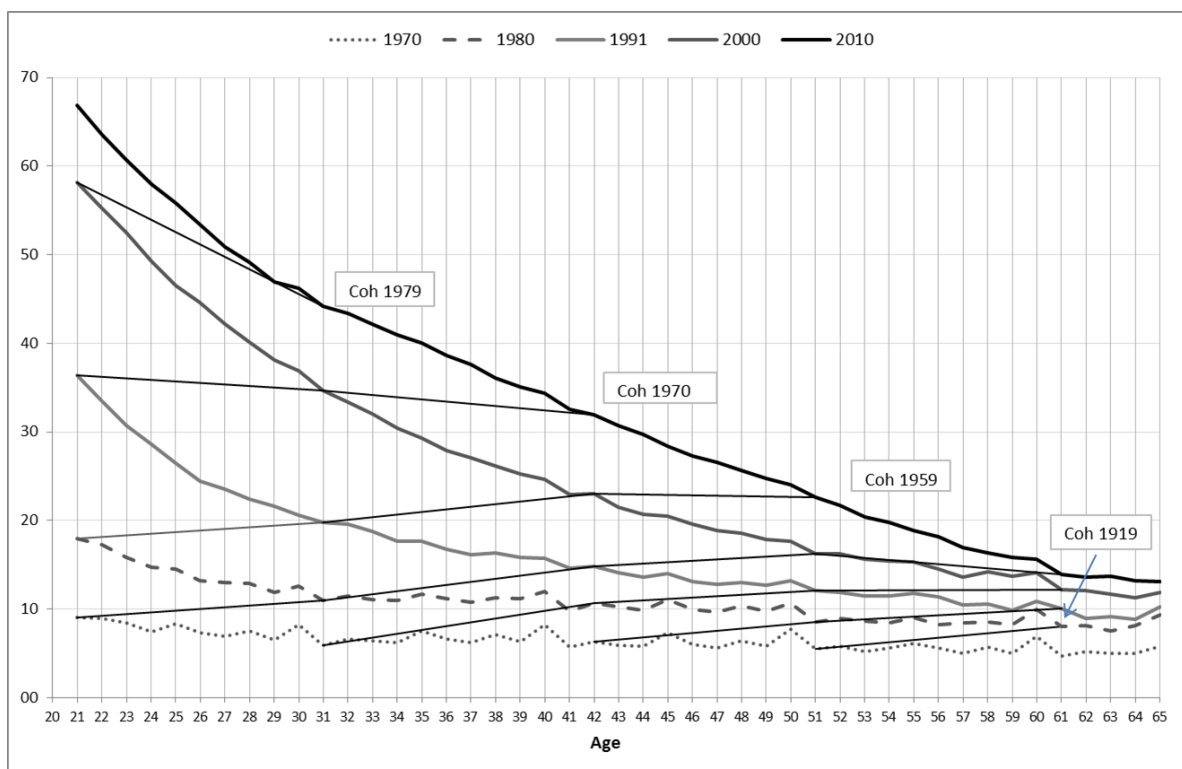
When cohabitation is only a short transient state, cohort tracks should be dropping off over time. Indeed, as cohabitors age and are 10 years older when observed at the next census, the majority of them should already have entered marriage. The data in Figure 4 show that this is indeed the case

for the youngest cohort. For the next older cohort born in 1970 there is only a minimal dropping off. And finally, for the cohorts born prior to 1960 the tracks even display a rise. This points at a number of additional conclusions:

(i) There has been a steady cohort-wise progression of cohabitation, with successive accelerations for each younger cohort compared to its immediate predecessor. This holds until the census of 2000. Thereafter, the progression is somewhat slower.

(ii) Cohabitation is not and has not been a short temporary premarital phase in Brazil (i.e. a short "trial marriage"), but on the contrary a much longer term form of partnership.

(iii) One cannot infer from the cohort tracks that cohabitation is stable in terms of possible successive partners. Both stable same partner cohabitation and unstable multiple partner cohabitation are consistent with these cohort profiles of Figure 4.

(iv) The fact that older cohort tracks even tend to rise with age suggests that there is a later age entry into cohabitation as well, presumably stemming from formerly married and divorced women.

8. Conclusions.

The availability of the micro data in the IPUMS samples for several censuses spanning a period of 40 years permits a much more detailed study of differentials and trends in cohabitation in Brazil than has hitherto been the case. The gist of the story is that the historical race/class and religious differentials and the historical spatial contrasts have largely been maintained, but are now operating at much higher levels than in the 1970s. During the last 40 years cohabitation has dramatically increased in all strata of the Brazilian population, and it has spread geographically to all areas in tandem with further expansions in the regions that had historically higher levels to start with. Moreover, the probability of cohabiting depends not only on individual-level characteristics but also on additional contextual effects operating at the level of meso-regions. Furthermore, the progression over time shows both a clear cohort-wise layering and a steady cohort profile extending over the entire life span until at least the ages of 50 and 60. Hence, we are essentially not dealing with a pattern of brief trials of partnership followed by marriage, but with extended cohabitation.

The rise of cohabitation in Brazil fits the model of the "Second demographic transition", but it is grafted onto a historical pattern which is still manifesting itself in a number of ways. Social class and race differentials have not been neutralized yet, young cohabitants with lower education and weaker earning capacity can continue to co-reside with parents in extended households (cf. Esteve et al. 2012b), and residence in predominantly Catholic and white meso-regions is still a counteracting force.

All this is reminiscent of the great heterogeneity among countries, regions and social groups that emerged from the studies of the "First demographic transition", and especially from those focusing on the fertility decline. Then too, it was found that there were universal driving forces, but that there were many context- and path-specific courses toward the given goal of controlled fertility. In other words, the local "sub-narrative" mattered a great deal. The same is being repeated for the "Second demographic transition" as well, and the Brazilian example illustrates this point just perfectly.

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Appendices.

Appendix table A1: Percentages cohabiting among partnered women 25-29 in Brazil and Brazilian States, 1960 to 2010 censuses (IPUMS samples).

	1960	1970	1980	1991	2000	2010
Rondônia	n.d.	13.57	15.40	30.65	42.62	53.36
Acre	n.d.	10.98	18.79	44.60	60.01	61.25
Amazonas	n.d.	9.64	17.51	41.05	60.08	66.97
Roraima	n.d.	20.10	22.85	45.81	61.55	68.19
Pará	n.d.	18.98	22.22	38.29	58.87	70.35
Amapá	n.d.	20.58	23.58	45.11	68.65	76.22
Tocantins	n.d.	n.d.	n.d.	19.35	38.27	54.59
Maranhão	n.d.	13.55	19.23	28.50	48.30	64.67
Piauí	n.d.	3.98	4.17	11.87	27.62	44.83
Ceará	2.48	3.43	7.34	17.93	35.71	50.37
Rio Grande do Norte	5.99	6.21	9.56	22.24	46.17	60.24
Paraíba	5.76	5.53	11.06	21.70	40.84	49.61
Pernambuco	12.34	13.71	21.41	31.42	48.53	53.93
Alagoas	10.35	11.10	16.59	28.21	46.01	53.52
Sergipe	13.56	11.98	18.47	33.43	50.85	63.32
Bahia	16.19	15.13	22.53	32.24	48.98	60.20
Minas Gerais	3.08	3.73	7.10	13.55	26.03	37.68
Espírito Santo	n.d.	8.07	11.77	20.84	34.16	40.67
Rio de Janeiro	12.60	13.90	22.64	31.96	45.07	52.55
Guanabara	n.d.	12.36	n.d.	n.d.	n.d.	n.d.
São Paulo	2.57	4.30	10.30	17.64	34.83	43.38
Serra dos Aimorés	5.17	n.d.	n.d.	n.d.	n.d.	n.d.
Paraná	2.49	3.06	7.00	13.64	28.86	43.00
Santa Catarina	n.d.	3.46	5.44	12.56	30.37	50.84
Rio Grande do Sul	5.22	4.95	9.20	19.76	40.59	60.56
Mato Grosso do Sul	n.d.	n.d.	18.06	28.15	45.23	53.55
Mato Grosso	11.62	10.82	13.50	24.84	44.16	55.60
Goiás	5.87	7.34	11.91	21.83	36.45	46.61
Distrito Federal	3.90	8.49	14.75	28.15	41.99	50.00
Fernando de Noronha	0.00	n.d.	44.44	n.d.	n.d.	n.d.
TOTAL	**6,17***	**7.59**	**13.00**	**22.22**	**39.27**	**51.02**

n.d = no data

* The 1960 total does not include the values of the n.d. states

Appendix Table A2: Predicting cohabitation (1) versus marriage (0) for women in a union age 25-29, Brazil 2000. Logistic regression coefficients of full model 6 and remaining variance between meso-regions

Variables	Category	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	Protestant Lutheran Baptist		-0.944	-0.929	-0.845	-0.844	-0.844
	Evangelical		-0.714	-0.751	-0.828	-0.829	-0.829
Religion	No religion		0.724	0.694	0.647	0.652	0.652
	Others		-0.170	-0.140	0.110	0.116	0.116
	Catholic		0	0	0	0	0
	Black			0.820	0.678	0.685	0.684
	Brown Brazil			0.514	0.387	0.384	0.384
Race	Indigenous			0.901	0.748	0.759	0.759
	Others			0.145	0.173	0.178	0.178
	White			0	0	0	0
	Less Secondary				1.403	1.391	1.391
Education	Secondary				0.543	0.542	0.542
	University				0	0	0
Migrant	Residence in another State					0.241	0.241
	Residence in State of birth						
	Catholic - No White -No Secondary (Cws)						0.109
	Catholic - No White - Secondary (CwS)						0.749
	Catholic -White -No Secondary (CWs)						0.121
Types of meso-regions	No Catholic - No White - No Secondary (cws)						0.877
	No Catholic -No White - Secondary (cwS)						1.299
	No Catholic -White - No Secondary (cWs)						0.298
	No Catholic - White - Secondary (cWS)						0.458
	Catholic- White -Secondary (CWS)						0
	Meso-regions variance	**0.320**	**0.342**	**0.299**	**0.336**	**0.322**	**0.193**

Appendix Table A3: Full OLS regression results of the three models predicting the change in percentages cohabiting among partner women between 1980 and 2010 in136 Brazilian meso-regions. Covariates measured in 2000 as percentages for women 25-29 in each meso-region

a) r30 = ln (Coha 2010/Coha 1980), results without control for initial cohabitation level. Rsq=0.650

Variable	DF	Parameter Estim.	Standar Error	t value	Pr > |t|	Parameter standardized
Intercept	1	-0.98518	0.3728	-2.64	0.009	0
Catholic	1	3.47761	0.34453	10.09	<.0001	0.657
White	1	0.9691	0.153	6.33	<.0001	0.422
Secondary	1	0.96482	1.08298	0.89	0.375	0.120
Migrant	1	0.27356	0.22425	1.22	0.225	0.071
Urban	1	-1.04587	0.4321	-2.42	0.017	-0.317

b) r30, results with initial cohabitation level of 1980 (Coha80). Rsq=0.845

Variable	DF	Parameter Estim.	Standar Error	t value	Pr > |t|	Parameter standardized
Intercept	1	1.5852	0.31962	4.96	<.0001	0
Catholic	1	1.15925	0.2926	3.96	0.000	0.219
White	1	0.25654	0.11627	2.21	0.029	0.112
Secondary	1	0.47144	0.72378	0.65	0.516	0.059
Migrant	1	-0.09826	0.15245	-0.64	0.520	-0.026
Urban	1	-0.7088	0.28957	-2.45	0.016	-0.215
Cohabitation 1980	1	-4.33242	0.33818	-12.81	<.0001	-0.679

c) Delta30 = (Coha2010-Coha1980) / (0.950- Coha1980). Rsq=0.239

Variable	DF	Parameter Estim.	Standar Error	t value	Pr > |t|	Parameter standardized
Intercept	1	0.8854	0.12543	7.06	<.0001	0
Catholic	1	-0.17619	0.11592	-1.52	0.131	-0.146
White	1	-0.13537	0.05147	-2.63	0.010	-0.259
Secondary	1	0.07723	0.36437	0.21	0.833	0.042
Migrant	1	0.00421	0.07545	0.06	0.956	0.005
Urban	1	-0.27755	0.14538	-1.91	0.058	-0.369

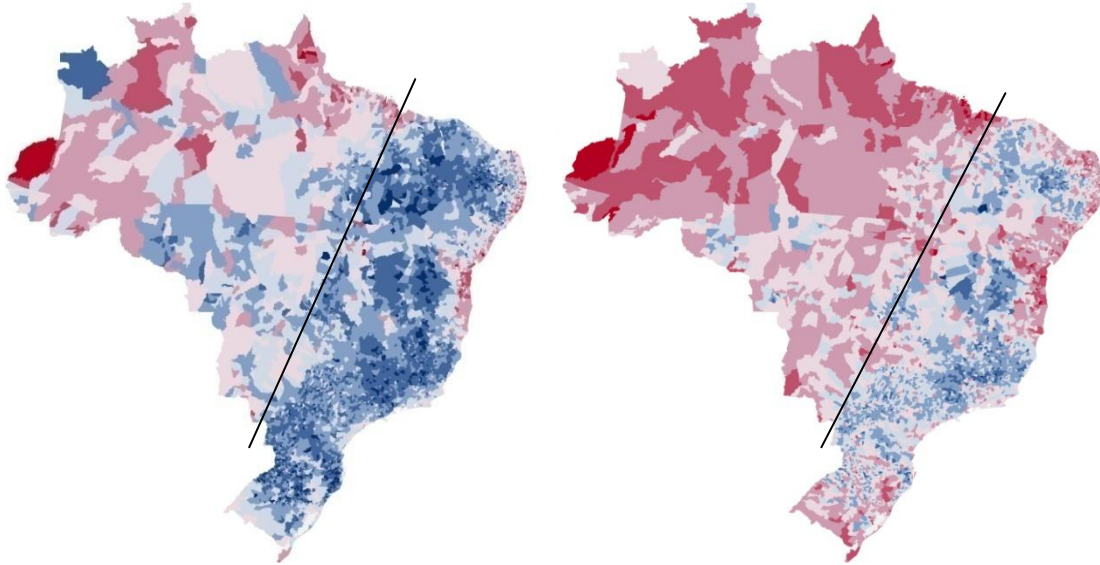Appendix Map A1: the States of Brazil.

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Appendix Map A2: Population density per square kilometer; Brazilian municipalities, 2000.
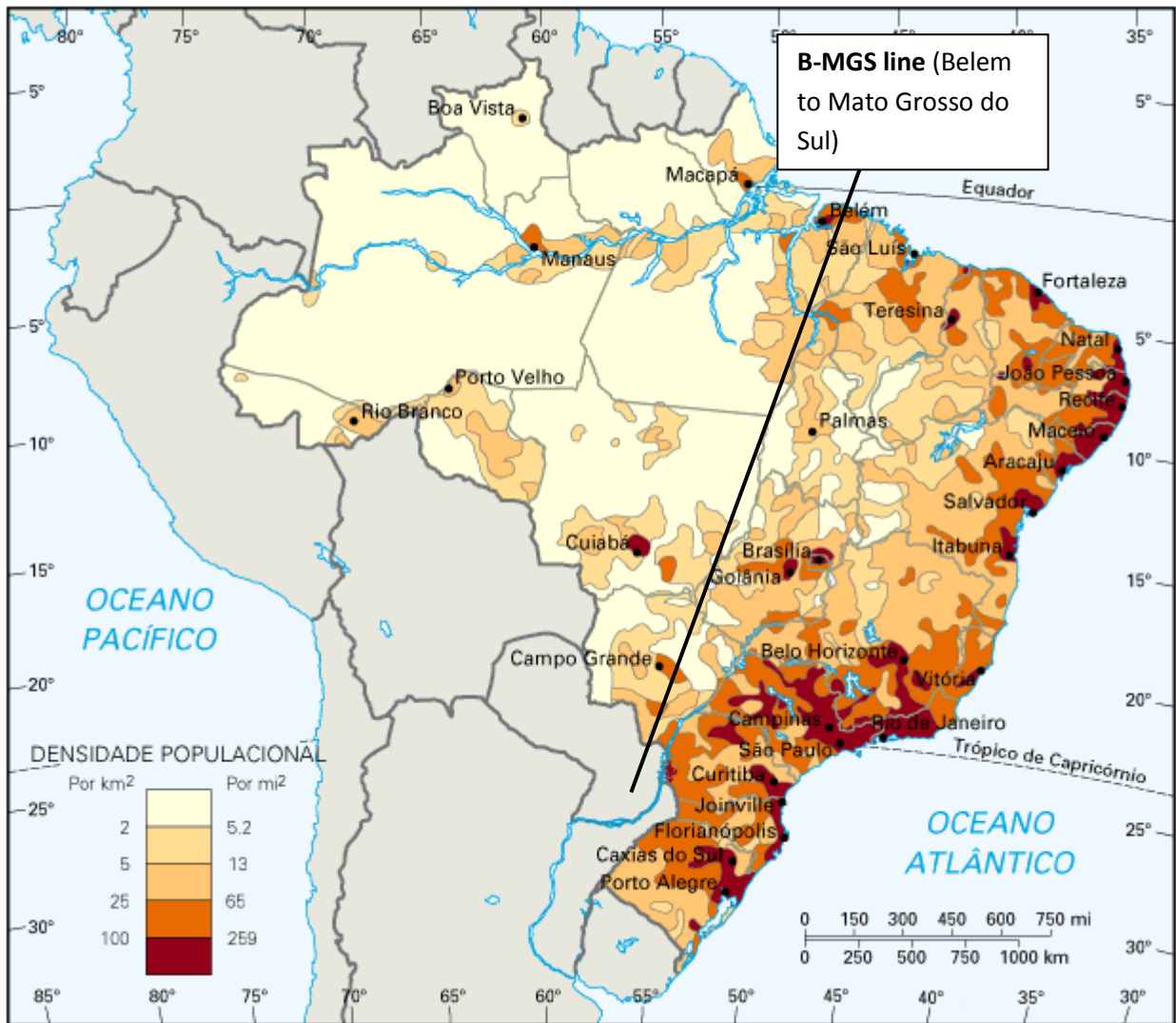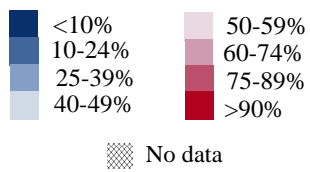
Appendix Map A3: Percentages cohabiting among all partnered women 25-29 in Brazilian
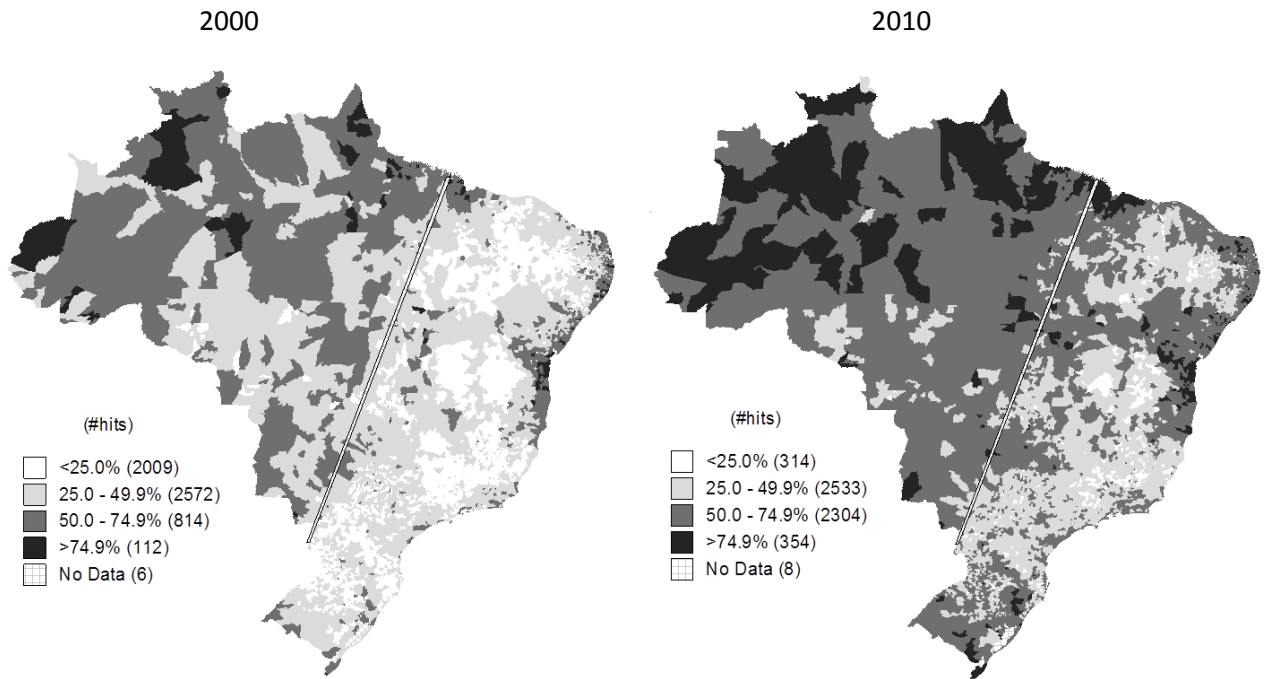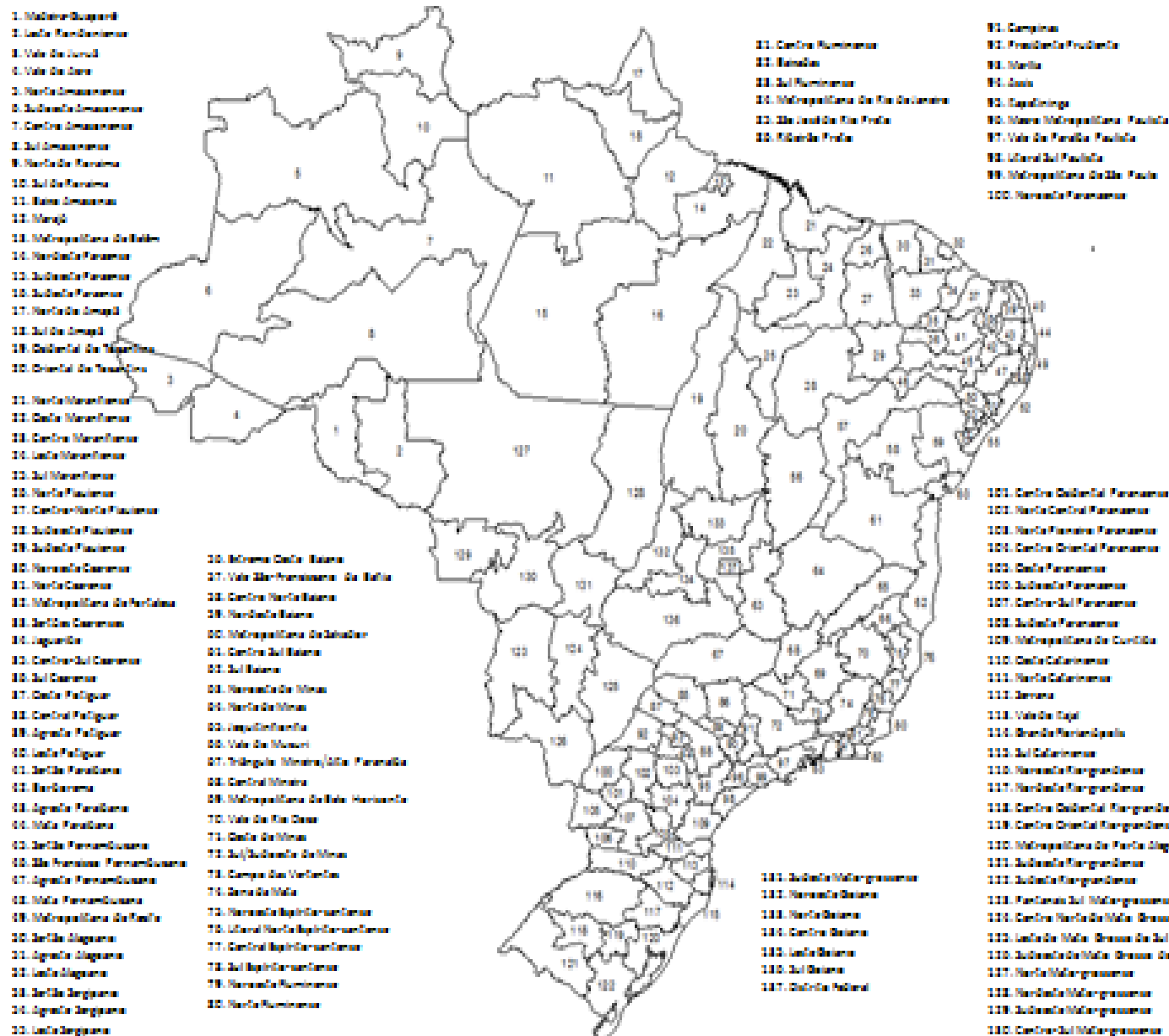municipalities, 2000 and 2010 (color version with more categories)

2000   2010

Share of consensual unions
among all unions
Women 25-29

■	<10%	■	50-59%
■	10-24%	■	60-74%
■	25-39%	■	75-89%
■	40-49%	■	>90%

No data

Appendix Map A3: Percentages cohabiting among all partnered women 25-29 in Brazilian municipalities, 2000 and 2010

2000

2010

(#hits)

☐ <25.0% (2009)
▨ 25.0 - 49.9% (2572)
▨ 50.0 - 74.9% (814)
■ >74.9% (112)
▦ No Data (6)

(#hits)

☐ <25.0% (314)
▨ 25.0 - 49.9% (2533)
▨ 50.0 - 74.9% (2304)
■ >74.9% (354)
▦ No Data (8)

Appendix Map A4: Identification of meso-regions

[i] By the wider European cultural sphere we not only mean Europe *senso stricto* but also Canada, the US, Australia and New Zealand.

[ii] The evolution of the percentages cohabiting among women 25-29 in a union (i.e. cohabiting + married) is given in Appendix Table 1 for the States and the country as a whole. As can be seen there, the share of cohabitation in the 1960 and 1970 census was of the order of only 6.2 and 7.6 percent, and at most just around 20 % in the 2 states with the highest incidence (Amapa and Roraima). In 2010, however, the national figure is 51 percent, and the figures now range between a low of 37.7 percent in the State of Minas Gerais and a high of 76.2 percent in Amapa.

[iii] The IPUMS data files contain samples of harmonized individual-level data from a worldwide collection of censuses. See Minnesota Population Center 2011.

[iv] The interpretation of the European cohabitation data has greatly suffered from such misinterpretations of educational and social class differentials observed in a *single* cross-section. These "gradients" were typically interpreted as the manifestation of "patterns of disadvantage", whereas measurements over several points in time showed that cohabitation rose – sometimes quite spectacularly – in *all* social strata, and in several instances even more among the better than the less educated women. The "too poor to marry" dictum is essentially a myth.

[v] The European migration that occurred between the end of the 19th and the beginning of the 20th century in Brazil was partially stimulated by the urbanization and industrialization of the country, but also aimed at the occupation of the countryside as well as at the replacement of slave workforce after the end of Slavery in 1888.

[vi] A Boolean minimization performed for these 8 combinations and predicting their level of cohabitation being either above or below the overall median for all meso-regions produces similar results, which are easily interpretable. The combinations that fall below the median are:

$$Coh<Me = C(W+s) + WS \quad or \quad Coh<Me = CW + Cs + WS$$

i.e. meso-regions tend to be below the median level of cohabitation among partnered women 25-29 when they exhibit the following combinations of just 2 characteristics, i.e. they are either Catholic and white(CW), or Catholic and lower education (Cs), or white and higher education (WS).

A linear decomposition of conditional probabilities of cohabiting using 4 dichotomized predictors, i.e. for the 16 combinations, gives the following average net effects for the contrasts:

C – c = -0.56
W-w = -0.67
S-s = +0.11
M-m = -0.09

This means that, across the three other dichotomies, the average difference in cohabitation percentages between the more Catholic and the less Catholic areas (C-c) is 56 percentage points less cohabitation in the areas with the C condition. Similarly, such a strong contrast is found for white versus non-white areas, with the former having on average 67 percentage points fewer cohabiting women. The contrast for the migration variable (M-m) is very small and negligible. However, the education contrast goes in the opposite direction from what is expected. This is entirely due to the wS and ws combinations: in non-white areas, cohabitation among young women is MORE prevalent in the better educated meso-regions than in the less educated ones. This may reflect the fact that non-white better educated women are starting partnerships much later, and therefore have a greater likelihood of still being in the premarital cohabitation phase. However, it should be noted that this is only so if the non-white condition (i.e. w) is met as well. In white areas (i.e. W), the educational contrast is smaller and goes in the expected direction, i.e. more cohabitation in the s than in the S categories.

[vii] The fact that the cwS group of meso-regions has the highest relative risk is concordant with the finding mentioned in the previous footnote, i.e. that non-white and not predominantly catholic areas with more better educated women have higher cohabitation rates possibly because of these women delaying partner selection to a greater extend.

[viii] The share of cohabitation among all partnered women in a union as of the 1960 census was only 6.45 %

[ix] We also ran this OLS regression for 136 meso-regions using only the absolute percentage points increase in cohabitation between 1980 and 2010. The results are much more in line with those of Delta30 than of r30: the absolute increases of cohabiting women in Catholic and white areas are essentially not different from those in the other areas, and again significantly smaller for urban areas only. In other words, all regions, except the urban ones, added otherwise fairly undifferentiated amounts to their historically prevailing baseline levels of cohabitation.