A Grammar of Mediterranean Patriarchy?

Historical and Regional Variants from Tuscany to the Balkans, the Levant and the Nile, 1427–1918

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Abstract

Germaine Tillion traced the subordination of women on both shores of the Mediterranean to a single "republic of cousins." We treat her claim as a hypothesis. Using census and census-like microdata for 108 regional populations (847,786 persons in sixteen samples taken between 1427 and the early twentieth century) from Tuscany and Mediterranean Spain to the Balkans, Istanbul, Ottoman Palestine, and Egypt, we compute the Patriarchy Index, a composite of eleven indicators of gender and generational inequality in family organization. The comparison runs within the Mediterranean; historical Europe, scored with the same code, and published estimates for American counties and Asian regions serve only as yardsticks. The eastern and southern Mediterranean was a high-patriarchy world, but not one system. Four-fifths of the variation lies between samples, and the ranking cuts across confession: Catholic Tuscany stands with Muslim-majority Palestine and Egypt and with Albania, Muslim Istanbul and Catholic Spain well below them. What set the high rim apart, from its Balkan neighbors as from the few equally patriarchal regions of the Russian east, was not the strength of the lineage but the fate of daughters and wives: the early marriage of girls and a deficit of girls among young children, a contrast that survives demographic controls. Florence, which forbade cousin marriage, scored with Palestine, so the endogamy at the heart of Tillion's account cannot have been the only route to high patriarchy. The Mediterranean is better read as a set of variants than as a model.

Keywords: patriarchy; family systems; historical demography; census microdata; Mediterranean; Ottoman Empire

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1 Introduction

In 1427 the officials of the Florentine catasto recorded, household by household, the rural population of the city's four quarters (Herlihy and Klapisch-Zuber 1985: 1–27). Nearly five centuries later and some 2,450 kilometers to the southeast, Ottoman registrars entered the villagers of the Hebron and Gaza districts into the population registers (nüfus) of late Ottoman Palestine. On a common index of family-based inequality between the sexes and the generations, the two populations are almost indistinguishable: the rural quarters of Florence score 28 and the rural south of Palestine 29 on a scale running from 0 to 40. Is this the same patriarchy?

A long tradition of scholarship would answer in the affirmative. Germaine Tillion (1983 [1966]) traced the subordination of women in a zone covering "the two shores of the Mediterranean, with their hinterlands" to a single endogamous and patrilineal order, the "republic of cousins," whose frontiers, she insisted, "are not those of the Muslim religion." Mediterraneanist anthropology built a culture area of honor and shame (Peristiany 1965; Gilmore 1987), and family historians long spoke of a Mediterranean pattern of late male and early female marriage and complex co-residence (Laslett 1983; Smith 1981). The same tradition has been taken apart with equal energy. The Mediterranean has been described as a category of comparison rather than an object of it (Herzfeld 1984; Pina-Cabral 1989; Horden and Purcell 2000), and historians of both its northern and southern shores have warned that the family is still too often discussed in monolithic terms, under the prefixes Arab, Muslim, or Mediterranean (Doumani 2003: 3; cf. Viazzo 2003; Huebner and Nathan 2017). Herlihy and Klapisch-Zuber, whose work on the 1427 catasto supplies one end of our puzzle, left the question open. Having found that "the wide age difference between the marriage partners" marked Tuscan society throughout the period they studied, they wrote: "Future research will show whether this is more Mediterranean than medieval," and they put the same question to domestic organization: "how stable, how Mediterranean or medieval are these patterns?" (Herlihy and Klapisch-Zuber 1985: 362).

The question is not only a historical one. The WomanStats Project scores the states of the world on a Patrilineal/Fraternal Syndrome scale running from 0 to 16, built from eleven indicators of the subordination of women to the male line (Hudson, Bowen, and Nielsen 2020).[1] In 2017 the states of the southern and eastern shores stood near the top of the world distribution: Jordan, Lebanon, and Palestine at 14, Syria at 13, Egypt, Algeria, Libya, and Morocco at 12, Tunisia and Turkey at 9, against 0 for Norway and Sweden and 15 for Afghanistan. The northern shore scored like northwestern Europe,

[1]These are patrilocal marriage, cousin marriage, brideprice and dowry, the age of marriage for girls, son preference and sex-ratio alteration, polygyny, inequity in family law and in women's property and inheritance rights, the level of violence against women, the societal sanction of femicide, and legal exemptions for rapists who marry their victims.

France and Italy at 1 and Spain at 2, and the Balkan states fell in between, from Albania at 9 to Montenegro at 6, Serbia and Croatia at 5, and Greece and Bulgaria at 4 (WomanStats Project 2017). Hudson and her colleagues treat the relationship between the sexes that this scale codes as "the first political order," one that shapes governance and security far beyond the family. Comparing historical measures of family patriarchy with present-day indices of gender equality, Kaser (2021: 63–64) located "a historical and contemporary European core of gender relations shaped by patriarchy" in the Balkans and the South Caucasus. Set beside historical measurements, as Section 5 shows, the contemporary scale keeps part of the old geography but not all of it. Whether the present contrast between the shores is the residue of an old regional order or the product of later divergence is a question that only historical measurement can answer.

The difficulty has never been a lack of ideas, nor, for several decades now, a complete lack of counting. On the northern shore, household reconstitution had by 1990 identified two family systems in the north and the south of Iberia and no fewer than three in Italy, and had thereby undermined the notion of a uniform Mediterranean joint-household system; later work found that even these regional systems concealed a mosaic of local ones (Viazzo 2003: 121; Rowland 2002). In the Balkans, Todorova (1996: 449–450) placed southeastern Europe, on household data for Serbia and northeastern Bulgaria classified by the Cambridge typology, in the larger European region in which nuclear family households predominated, and Bulgaria closest to Laslett's "southern" set of tendencies. Duben and Behar (1991) measured Muslim Istanbul, and the contributors to Doumani (2003) Cairo in 1848 and Damascus in 1907 (Fargues 2003; Okawara 2003). What has been missing is a common metric. These studies classified households by composition, most often in a single community or city, with categories built on assumptions that, as Rowland (2002: 62) observed, took the English case as their implicit standard of comparison; none measured gender and generational inequalities, the subject of this paper, and none placed the populations of the two shores on one scale. The quantitative comparison of family patriarchy has meanwhile been built almost entirely on European data (Hajnal 1982; Szołtysek et al. 2025). In this paper we take advantage of a body of historical microdata that has only recently become available in harmonized form, and we use it to treat the "Mediterranean family" as a hypothesis to be tested. In doing so we take at her word Schilcher (1988: 497), who considered patriarchy "a valid historical concept only when we have categories of analysis in which it can be measured and discussed so that we can talk about its varying degree or extent."

Our empirical basis consists of 108 regional populations comprising 847,786 persons, drawn from sixteen samples. We use the Florentine catasto of 1427, the Ottoman population registers of Palestine reconstructed by the LOOP project, the Egyptian census samples of 1848 and 1868 distributed by IPUMS-International, and the census samples for Albania, Montenegro, Serbia, the Rhodopes, the Danubian principalities and Bessara-

bia, Kythira, Zagreb, and Istanbul compiled at the University of Graz.[2] From Mosaic come the parish listing of the area of Dubrovnik in 1674 and four Spanish samples of 1752 to 1890 from Andalusia, Murcia and Almería, the Ebro valley, and Catalonia. For each population we compute the Patriarchy Index (PI), a composite measure of gender and generational inequalities embedded in domestic organization, household formation, marriage behavior, and the sex composition of children (Gruber and Szołtysek 2016; Szołtysek et al. 2017).

With these data at hand, the paper asks three questions that have seldom been posed systematically. First, how distinctive were the levels of family-based gender and age inequality in the historical Mediterranean when placed against other world regions? Second, do the regional differences represent stronger and weaker expressions of a single Mediterranean patriarchal system, or do they point to structurally different arrangements? Third, do these differences persist once we account for the demographic conditions that may shape regional levels of patriarchy?

The historical Mediterranean, as captured by our data, was a high-patriarchy world by any yardstick available. Yet it was not one system: most of the variation lies between populations, which fall into a high rim, a Balkan interior, and two lower groups, the Danubian plain and the western shore, and similar overall scores are produced by different combinations of domains. What separates the rim from the interior is not the strength of the lineage in co-residence, but the treatment of daughters and wives. This difference survives the demographic controls we are able to apply.

After discussing the Mediterranean as a hypothesis, we present the sources, the units of analysis, and the index. We then examine, in turn, the level of patriarchy against external benchmarks, the variation within the Mediterranean, the decomposition of the main regional contrast, and its robustness to demographic conditioning. We conclude by returning to Tillion and to the distinction between the codes she described and the structures our data can observe.

2 The Mediterranean as a hypothesis

The Mediterranean has never had an agreed boundary, and for a study of this kind the boundary is not a formality. Braudel (1972 [1949]), whose book made the sea a unit of historical analysis, drew two. One is the climatic and agrarian Mediterranean of his map of "the 'true' Mediterranean, from the olive tree to the great palm groves" (ibid.: fig. 19); drawn by the olive, it leaves out the Danubian plain and the Balkan interior, where the tree does not grow. The other is the "Greater Mediterranean" of his chapter on its boundaries, "a Mediterranean of historical dimensions" whose reach he

[2]Part of them are already in the Mosaic database (Section 3.1).

followed into the Sahara, across the isthmuses of Europe, and into the Atlantic (ibid.: pt. 1, chap. 3). Neither was defined by the family, about which Braudel had little to say. Family historians drew the line again. Laslett's (1983) account of European domestic organization placed the Balkans in its Mediterranean region, "a statement not without its problems," as Kaser (1994a: 246) put it. Kaser later replaced it, for gender relations, with a "Eurasia Minor" of the Balkans and Turkey (Kaser 2008: 1), organized by patrilineal descent and set apart both from the narrower northern Mediterranean, where "kinship organization was based on conjugality" (ibid.: 39), and from the Arab world, which kept marriage endogamy (ibid.: 274). Within the Ottoman Empire, he has since noted, "other variants of patriarchy were practised" in "its Mediterranean and Arabic regions" (Kaser 2021: 58).

We do not choose among these definitions in advance. We take the widest of them, Tillion's two shores and their hinterlands, as the frame of the hypothesis, because hers is the definition whose claim concerns the family, and we treat the inclusion of the Balkan hinterland as part of what is to be tested. On the western shore, where Tillion names Spain and the south of France as wholes, we read her phrase literally, as the shore and the hinterland that faces it. A population counts as Mediterranean if it lies on the Mediterranean coast or in a basin that drains into the sea, and the populations of the Atlantic side remain in the European benchmark. Applied in the east, the same rule would remove the Serbian, Danubian, and Zagreb samples, whose rivers run to the Black Sea; we keep them as part of Tillion's hinterland, and Section 4 shows what becomes of the results under this and five other definitions, from Tillion's countries taken whole to a littoral Mediterranean.

At least three "Mediterraneans" circulate in the literature on family and gender, and none of them was built on measured family behavior. The first is Tillion's. Writing from long fieldwork among the Berber-speaking Shawiya of the Aurès mountains of eastern Algeria, begun in 1934, she argued that the seclusion and devaluation of women across a zone covering both shores of the sea derived from an endogamous, patrilineal kinship order whose ideal was "to keep all the girls in the family for the boys in the family" (Tillion 1983). Its material logic ran through inheritance: to keep the patrimony within the lineage, families chose "to disinherit all daughters (which means violating the law of the Koran) and to marry them systematically to relatives in the paternal line." Tillion located the boundaries of this order not in religion but in kinship, and she explicitly included "the entire Christian shore of the Mediterranean." Her argument was a deliberately long-run and speculative one; it was never meant to be a statistical generalization, but it is the kind of claim that historical microdata can now confront.

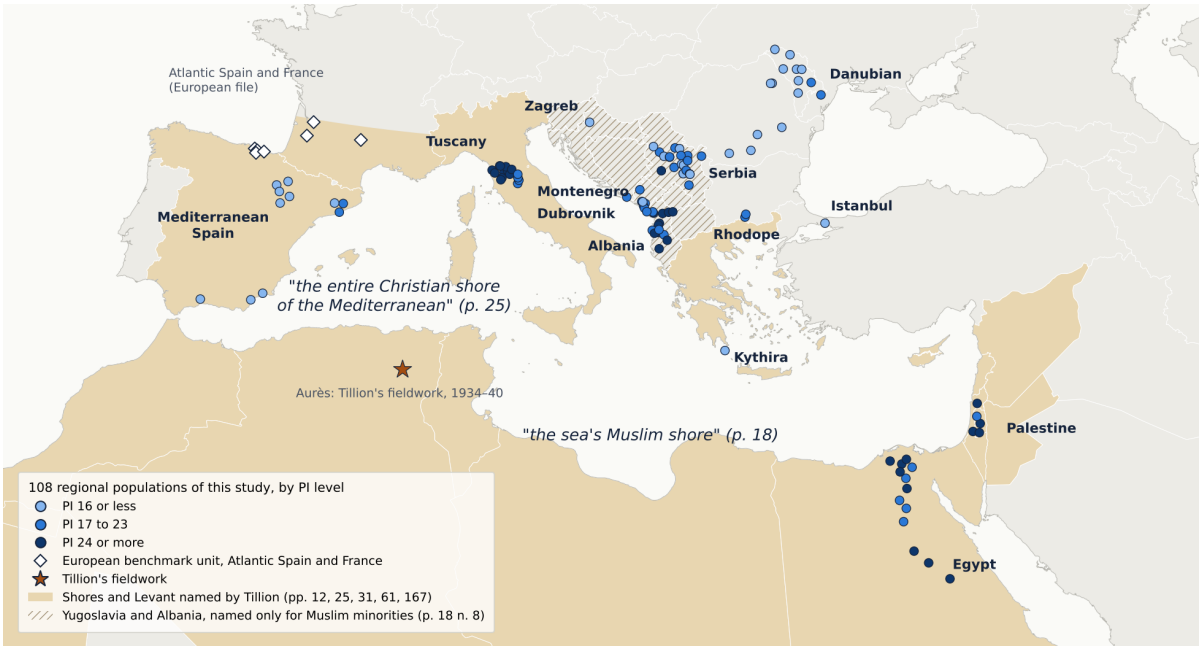
Tillion never drew her zone, but the markers she left in the text can be assembled, and they show where her argument was grounded and where it was silent (Figure 1). She gave the "Mediterranean structure" "a geographical label and domain of its own:

the two shores of the Mediterranean, with their hinterlands" (Tillion 1983: 14), within a wider complex that "stretches and sprawls from Gibraltar to Japan" around an epicentre in the "Mediterranean Levant" (ibid.: 12). The question she put in a note, whether the zone was "limited by the Danube, the Senegal, and the Ganges" (ibid.: 17 n. 7), concerned that wider complex and the Neolithic dispersal from the Levant to which she traced it, not a boundary of the Mediterranean structure itself. The shores themselves she named: on one side lay the Maghreb, where she had spent some ten years in the field, which she took to comprise five states from the Atlantic eastward, Mauritania, Morocco, Algeria, Tunisia, and Libya, with Egypt as "the border country in which the two contrary currents of Maghreb and Levant meet" (ibid.: 31). On the other lay "the Mediterranean fringe of Christianity—Spain, the south of France, Corsica, Italy, Sicily, Sardinia, Greece, Cyprus, Christian Lebanon" (ibid.: 167). The Balkans appear only in a footnote, as a region where "significant Muslim minorities are also found north of the Mediterranean (Yugoslavia, Albania)" (ibid.: 18 n. 8). Our samples thus touch both of her shores, in Tuscany, Mediterranean Spain, Kythira, Palestine, and Egypt, but most of our populations lie in the one part of her zone that she left undescribed, between the Adriatic and the Black Sea, and Istanbul lies in a country she does not count among the shores. Of her Christian shore, only the Atlantic side of Spain and of southern France remains in the European benchmark.

Murdock's Ethnographic Atlas offers a second map, this time coded, against which Tillion's verbal one can be read (Murdock 1967; Kirby et al. 2016). For each society it records, as ethnographers described it at a focal date between the 1870s and the 1960s, the organization of the household, the rule of marital residence, the rule of descent, and the range of cousins one may marry (variables EA008, EA012, EA043, and EA023 in D-PLACE n.d.). Its Mediterranean is divided where Tillion's is not. The Arabic- and Berber-speaking societies of the southern and eastern shores, from the Algerians of the 1870s, the Kabyle, and the Shawiya of the Aurès, whose dialect Tillion spoke (Tillion 1983: 31 n. 32), to the Egyptian fellahin, the Syrians, and the Druze, are coded as patrilineal and patrilocal, with extended households and with marriage permitted to any first cousin; so are the Turks. The Serbs and the Gheg of northern Albania are coded as patrilocal with small extended households as well. The Spaniards, the Neapolitans, and the Greeks, by contrast, are coded as bilateral, with nuclear households and neolocal or virilocal residence. No society in the Atlas stands for rural Tuscany, and its codes record ethnographic norms, not counted behavior; but it anticipates two features of our results, the resemblance of the Balkan interior to the southern and eastern shores in the organization of co-residence, and the distance of the western and Greek shores from both.

The second Mediterranean is that of the anthropology of honor and shame. From the 1960s onward, a body of ethnography constructed the region as a culture area uni-

Figure 1: Tillion's Mediterranean and the populations observed



Notes: Shaded: the countries Tillion names on the Christian and on the Muslim shore and in the "Mediterranean Levant" she placed at the center of the complex (Tillion 1983: 12, 25, 31, 61, 167), drawn with present-day borders and, for France, only its southern part; Turkey and Iraq, which she does not count among them, are left blank. Hatched: Yugoslavia and Albania, which she mentions only for their Muslim minorities (ibid.: 18 n. 8). Dots: the 108 regional populations of this study by Patriarchy Index level, Mediterranean Spain and the area of Dubrovnik among them; diamonds: the seven regions of the European benchmark on the Atlantic side of Spain and southern France. The shading renders Tillion's verbal geography and claims nothing about the extent of any practice.

fied by values of male honor and female shame (Peristiany 1965; Gilmore 1987). The same construction was soon criticized as an artifact of comparison, a "Mediterraneanist" category that projected coherence onto disparate societies and essentialized their gender orders (Herzfeld 1984; Pina-Cabral 1989), and Horden and Purcell (2000) later reframed the Mediterranean as a zone of fragmented micro-ecologies connected by mobility, a view that offers little support for a single family regime. More recent work has kept the concept while turning its meaning around: Tsibiridou (2022) reads male honor in Greece, the Western Balkans, and the Caucasus not as a neutral cultural value but as a signifier of male domination, one layer of a palimpsest of patriarchy laid down across the post-Ottoman space.

The third is the belt of "classic patriarchy" that Kandiyoti (1988) described, stretching from North Africa across the Muslim Middle East to South and East Asia, organized around the patrilocally extended household, early marriage of girls into their husbands' families, the subordination of young brides to senior women, and a strong preference for sons. Caldwell had earlier called much the same zone a "patriarchal belt," which later work draws from North Africa through the Muslim Middle East, including parts of Turkey, and Central Asia to South Asia, sometimes adding rural China; on neither read-

ing does it reach the European shore of the Mediterranean (Littrell and Bertsch 2013: 311). Kandiyoti did not treat the Mediterranean as a unit at all; her belt both cut across the sea and ran far beyond it, and she later retreated from the notion of patriarchy as an overarching system of oppression (Hunt 2018: 3–4). Yet the elements of her definition map closely onto the domains our index measures: generational hierarchy, patrilocal residence, the position of women in marriage and headship, and son preference.

Family historians added a demographic Mediterranean of their own. Laslett (1983) placed the region at the far end of a European gradient of household organization, with late male and early female marriage, large age gaps between spouses, and frequent complex co-residence. Smith (1981) asked whether the Tuscan households of the catasto were "medieval or Mediterranean," and Saller (1994) found among Romans of the inscription-erecting class the same Mediterranean pattern of late male and early female marriage that is found in more recent eras. The empirical foundations of this model have been steadily eroded. For Italy, Viazzo (2003) showed that thirty years of research had replaced a single Mediterranean pattern with a mosaic of local systems. For antiquity, Huebner (2017: 9) concluded that the idea of a single Mediterranean family had to be abandoned. For the Ottoman and Arab world, Doumani (2003) and Duben and Behar (1991) demonstrated a diversity of household forms that undermines any single "Middle Eastern family," and Duben and Behar described late nineteenth-century Muslim Istanbul as following a northeastern Mediterranean and Balkan urban pattern, not the joint-family system of rural Anatolia.

The demographic Mediterranean has also been questioned at its source. Hajnal (1982) drew his picture of Italy and southern Europe from a single graph in Herlihy and Klapisch-Zuber's study of the 1427 catasto, and Armstrong-Partida and McDonough (2023) have recently argued that the resulting image of a south in which women passed directly from the paternal to the marital household rests on records that underrepresent servants, migrants, and enslaved and freed women. Others have moved the line rather than erased it. Reher (1998) redrew it by the strength of family ties instead of household composition, and on Micheli's (2018) reading of his argument the regions facing the sea combined strong ties of descent with neolocal household formation. Sacchi and Viazzo (2018) recall that nuclear households prevailed in southern Portugal, Spain, and Italy, and in parts of Greece, at least from the early modern period. Closing a volume devoted to the question for antiquity, Nathan (2017: 335) proposed to treat the region not as a unified sphere but as a sociocultural continuum, on which the common and the local factors that shaped household and family composition can be examined. For the Middle East, a generation of gender scholarship has likewise questioned the idea of the Middle Eastern family as an eternal base of classical patriarchy (Dahlgren 2008: 4).

The existing "Mediterraneans" are defined by different criteria (kinship ideology, moral values, household composition, the strength of family ties, or a structural syn-

drome of patriarchy) and therefore need not coincide. In particular, the marriage rule that is central to Tillion and to Courbage and Todd (2011), who identify an endogamous, patrilineal and patrilocal family in the Arab world, separates populations that may otherwise organize co-residence in similar ways. As Courbage and Todd note, the Muslims of Bosnia, Albania, and Kosovo are "resolutely exogamous," and Kosven (1963) described the Dinaric brotherhood as exogamous as a rule. More important for our purposes, none of these traditions rested on family behavior measured across populations counted at the time.

We therefore treat the Mediterranean as a hypothesis with three testable implications. If a distinctive Mediterranean patriarchy existed, its populations should score high when placed against other world regions. They should differ from one another in degree rather than in kind, with variation concentrated within rather than between regional samples and with similar profiles across the domains of patriarchal authority. Their differences, finally, should persist, or disappear, in interpretable ways once demographic conditions are held constant.

3 Sources, units and the Patriarchy Index

3.1 The sources and their common logic

Our data combine sixteen samples of household-level microdata, each drawn from one type of source within one period of enumeration (Table 1). The Tuscan data come from the Florentine catasto, decreed in May 1427 and revised through 1429. It was coded from the campioni by Herlihy and Klapisch-Zuber between 1966 and 1976, in one of the first mass computerizations of a medieval source. The University of Wisconsin distributed it in 1981, Brown University re-edited it for the city as the Online Catasto in 2002, and the EHESS released it in 2016, in open access, for the whole survey (Herlihy and Klapisch-Zuber 2016).[3] We work from the 2016 edition, checked against the Wisconsin distribution and rendered into the coding scheme of Mosaic. The Palestinian data were reconstructed from the late Ottoman population registers (nüfus esas defterleri) by the LOOP project at the Ruhr-Universität Bochum and harmonized for this study by the authors. The Egyptian data are the samples of the censuses of 1848 and 1868 drawn and digitized by Saleh (2013), which we use as IPUMS-International distributes them, without drawing a sample of our own, and pool within each province where both censuses survive (cf. Cuno and Reimer 1997). The remaining eight samples, from Albania, Montenegro, Serbia, the Rhodopes, Wallachia, Bessarabia and the Catholic communities of Moldavia, Kythira, Zagreb, and Istanbul, come from the historical census samples for southeastern Europe compiled by Siegfried Gruber at the University of Graz (University of Graz n.d.), which

[3]The harmonized Mosaic edition now in preparation is announced in Szołtysek (2026).

follow the selection and coding protocols of Mosaic.[4] The Istanbul data are the sample of the permanent Muslim population of the city's five central districts in the censuses of 1885 and 1907 drawn by Duben and Behar (1991: 18), the two pooled here into a single unit to enlarge the sample.

Five further samples come from the western half of the sea and from the Adriatic, and all of them are taken from the Mosaic database (Gruber, Szołtysek, and Ogórek 2023). The oldest is a status animarum of 1674 for 24 localities of the area of Dubrovnik, a parish listing of souls by household covering the Roman Catholic parishes of Lisac and Pridvorje, prepared for Mosaic in Rostock in 2012 (C. Rose). The Catastro de Ensenada, the fiscal survey of the Crown of Castile and a source comparable to the Florentine catasto, supplies the Andalusian localities of Colomera and Estepona in 1752. The census of 1860 for the province of Zaragoza and the Spanish census of 1887 for the towns of Vera, Mazarrón, and Tudela were prepared at the University of Zaragoza (F. Marco García), and the local censuses of 1880–1890 for Catalonia by A. Cabré and J. M. Pujadas-Mora. The Basque and Cantabrian localities of the 1887 sample and the three populations of southern France, also in Mosaic, lie on the Atlantic side and remain in the European benchmark.

Although the sixteen samples come from fiscal surveys, church listings of souls, population registers, and censuses taken by states and churches from Florence and Castile to the Ottoman Empire and Egypt over almost five centuries, they share the property on which the index depends. Each lists every person individually, groups persons into co-resident domestic groups, and records each person's sex, age, and relationship to the head of the group, and, in most of them, marital status.[5] This was the precondition on which the Mosaic project was built.[6] Fourteen of our sixteen samples rest on Mosaic's protocols of selection and coding: the eight southeastern European samples of the Graz collection, in Mosaic or prepared for it, the five western samples taken from Mosaic, and the Tuscan catasto, rendered into the same scheme for this study. The Egyptian

[4] Albania in 1918, Istanbul in 1885 and 1907, Serbia in 1884, Wallachia in 1838, the Catholic listings of Moldavia, the Rhodope listings, and Kythira in 1724 are already distributed in the Mosaic database; Bessarabia in 1850, Serbia in 1863, and Montenegro in 1879 were prepared in Gruber's project "Demography and society in historical Southeastern Europe" (FWF P 34285) and announced as forthcoming additions to Mosaic, of which they are not yet formally part (Szołtysek et al. 2025: note to Fig. 3); Zagreb in 1857 comes from the Vienna Database on European Family History.

[5] The Egyptian censuses do not record marital status, which was reconstructed from the relationships (Technical note 1), as it was for Serbia in 1863 and Montenegro in 1879; the Palestinian registers record it for only about a fifth of the persons.

[6] The two collections from which it grew, the CEURFAMFORM database for Poland–Lithuania (Szołtysek 2015) and the Albanian census of 1918 (Kaser et al. 2011), described every individual in a locality, grouped into co-resident domestic groups, by age, sex, marital status, and relationship to the household head, and their domestic groups took in not only the head's core family but also his relatives, co-resident servants, and lodgers (Szołtysek et al. 2025). Every later Mosaic collection was admitted only after the preconditions for its inclusion had been examined and the categories with which each survey was conducted had been traced (ibid.).

Table 1: The sixteen samples

Sample	Source	Years	Units (urban)	Persons	Predominant confession	Collection
Tuscany	Florentine catasto	1427	16 (7)	260,638	Catholic	EHESS edition
Dubrovnik	Status animarum (parish listing of souls)	1674	1 (0)	1,880	Catholic	Mosaic
Kythira	Venetian census	1724	1 (0)	5,060	Orthodox	Graz; Mosaic
Spain (Andalusia)	Catastro de Ensenada (fiscal survey)	1752	1 (0)	2,052	Catholic	Mosaic
Danubian	Catholic listings of Moldavia; census of Wallachia; census of Bessarabia	1781–1879; 1838; 1850	15 (1)	55,533	Orthodox; Catholic in the Moldavian listings	Graz; Mosaic (Bessarabia: FWF)
Egypt	Census registers	1848, 1868	13 (0)	64,270	Muslim majority; Coptic minority	IPUMS-International
Zagreb	Habsburg census	1857	1 (1)	8,021	Catholic majority	Graz; Vienna
Zaragoza	Population census, province of Zaragoza	1860	4 (0)	25,725	Catholic	Mosaic
Serbia	Population censuses	1863, 1884	21 (12)	139,975	Orthodox	Graz; Mosaic (1863: FWF)
Rhodope	Household listings	1877–1947	2 (1)	8,373	Christian and Muslim communities	Graz; Mosaic
Montenegro	Census	1879	7 (1)	54,661	Orthodox majority	Graz, FWF
Catalonia	Local censuses	1880–1890	3 (2)	23,997	Catholic	Mosaic
Palestine	Ottoman population registers (nüfus esas defterleri)	1884–1915	5 (2)	14,313	Muslim majority	LOOP
Istanbul	Ottoman censuses	1885, 1907	1 (1)	8,354	Muslim (sample restricted to Muslims)	Graz; Mosaic
Spain (Murcia, Almería, Navarre)	Population census	1887	3 (3)	34,323	Catholic	Mosaic
Albania	Austro-Hungarian census	1918	14 (6)	140,611	Muslim majority; Catholic and Orthodox minorities	Graz; Mosaic
All samples		1427–1947	108 (37)	847,786		

Notes: Samples in order of date. A unit is a regional population; urban units in parentheses. Collection: EHESS, the open-access edition of the catasto (Herlihy and Klapisch-Zuber 2016), rendered into the Mosaic scheme for this study; LOOP, the Ottoman registers reconstructed at the Ruhr-Universität Bochum; IPUMS-International, the Egyptian census samples (Saleh 2013); Graz, the southeastern European census samples compiled by Siegfried Gruber on Mosaic protocols (University of Graz n.d.), with Mosaic marking those already in the Mosaic database, FWF those prepared in project P 34285 and announced as forthcoming Mosaic additions (Szołtysek et al. 2025), and Vienna the sample from the Vienna Database on European Family History; the five western samples are taken from the Mosaic database (Gruber, Szołtysek, and Ogórek 2023). Confession is the predominant one in the population covered by each source.

samples come from IPUMS-International, which since 2024 has also distributed part of the Mosaic data (Gruber, Szołtysek, and Ogórek 2023), and the Palestinian registers reconstructed by the LOOP project were converted to the same scheme before the index was computed. All sixteen samples thus share the international coding scheme of IPUMS (Sobek and Kennedy 2009), from whose relationship variables the indicators of the index are computed, and enter the computation in one format.

Three of our sources, the Florentine catasto, the Ottoman population registers, and the Egyptian census registers, were examined for this study, not in Mosaic's admission procedure (the Mosaic edition of the catasto is still in preparation), but they reach for the same object as the others. The Florentine catasto of 1427 required every taxpayer to submit a declaration (portata) of his possessions and of the "mouths" (bocche) of his household, stating their "names, ages, relationship to the head, occupations" (Herlihy and Klapisch-Zuber 1985: 12–13; on the making of the survey, ibid.: 1–27, and Emigh, Riley, and Ahmed 2016: 92–97). The head was generally the oldest male, a cultural category that the officials used to organize the declarations, and persons who owed no tax, rural women and the poor among them, were recorded all the same (Emigh, Riley, and Ahmed 2016: 93–94). Its fiscal household was not, in the strict legal sense, a co-residential unit: adult servants filed their own declarations, slaves were listed among the household's property rather than its mouths, and sons living abroad could be counted with their parents. Herlihy and Klapisch-Zuber nevertheless treated it as one, and with reason, for the scribes of the rural Estimo of 1371 had already defined the hearth as "all those who stay and sleep together in one and the same residence and who survive together on the same bread and wine." Provided that historians keep that definition in mind, they concluded, the taxpaying household of the catasto can well serve the purposes of social history. The divergences they identified bear on our indicators in known directions: the omission of resident servants lowers the share of women recorded as non-kin, a bias we bound below, and the inclusion of absent sons slightly raises measured co-residence.

The Palestinian data come from a different kind of document. The nüfus esas defterleri were not census schedules filled in on a single day but continuous population registers. They were opened at a general enumeration, in Palestine in the 1880s and again in 1905, and then kept up to date with births, deaths, marriages, and moves, so that the LOOP team can trace the growth of a single household from 1864 to 1917 (Büssow 2026). The registers of the 1905 round were compiled under the census ordinance of 1318/1902, which introduced a strictly gender-specific and hierarchical order of listing. Enumerators were to begin with "the person who is recognized as the owner and manager of the household" (hanenin sahib ve müdürü tanınan kimseden başlayarak) and then to list the sons, daughters, and grandchildren and the other persons inseparably connected to the household (art. 63, as translated in Büssow 2026). The LOOP project accordingly treats the registered household as an administrative unit, the persons whom the Ot-

toman administration acknowledged as represented by a household head, every member being described by relation to that head (ibid.). The Ottoman household was thus a unit defined by the state around a senior male, a convention that depresses female headship; but it is a unit of the same kind as the others, a group of persons attached to a head and listed individually by sex, age, marital status, and relation to him. Because the registers ran on after the enumeration, we reconstructed each register's population on the day it was opened, as a census taken on that day would have counted it. The registration date decides: persons entered at the opening are kept, and everyone entered later is excluded, whether a child born afterwards, a wife who married into the household, a household that moved to the locality, or a person whose entry was simply delayed. Where a registration date is missing, children born after the year of the opening are excluded, so that a few born in that year after the opening remain in the data. The registers were not opened in the same year everywhere, and the units therefore combine registers opened in different years: the rural north 1905–1912, the rural center 1884–1905, the rural south 1905, the towns of the north and center 1905–1915, and the town of Hebron 1905. The LOOP corpus from which these units are drawn is a purposive selection, not a random sample. The LOOP project has concentrated on rural communities, as a corrective to the long concentration of research on Jerusalem and the other famous cities. It chose the sixteen settlements of its rural sample and its towns to cover as many regions of late Ottoman Palestine as possible, the main types of settlement from village to town, and the main confessional communities, within the limits set by the registers available in high-resolution scans when the project began (Büssow 2026). Most regions and districts are covered, but the areas around Haifa and the Sea of Galilee (Safed and Tiberias) and the Nablus highlands are not, chiefly because the surviving inventory is fragmentary: of the 801 villages that an Ottoman atlas of 1907 lists for the Palestinian districts, only a part is represented. The inventory has since been digitized in full, which will allow some of these gaps to be filled. Our five Palestinian units therefore describe the rural and small-town population of the localities studied, not Palestine as a whole, and in what follows "Palestine" is shorthand for that population; the design trades the estimation of regional totals for breadth across contrasting local settings.

The Egyptian censuses of 1848 and 1868 are among the earliest individual-level population censuses of any non-Western country, and the earliest in the Middle East and North Africa to enumerate the whole population, women, children, and slaves included (Saleh n.d.). They survive in thousands of handwritten registers in the National Archives of Egypt, from which nationally representative samples of about 80,000 persons per census were digitized (Saleh 2013). No printed questionnaire was used. The registers list, person by person, name, age, sex, relationship to the household head, legal status (free, slave, or emancipated), religion, nationality, origin, and occupation, and the household is the person or group sharing "the same living quarter, food and spending the night

together," slaves and servants included. Soldiers and foreigners were enumerated separately, and Bedouin tribes appear in registers of their own, which are not part of the IPUMS samples (IPUMS-International n.d.), so the Egyptian samples represent the sedentary population. In the urban provinces, moreover, the registers record the age of women only as child or adult (Saleh 2013), so that the age-specific indicators of the index cannot be computed there; the urban provinces of Cairo and Alexandria are therefore excluded, and the thirteen Egyptian units represent the provincial population. Bread and wine in Florence, inseparability in the Ottoman ordinance, shared quarters, food, and sleep in Egypt: the three sources define the domestic group by the same criteria of co-residence and commensality that underlie the European censuses. What the Egyptian registers lack is marital status, which we reconstruct from the roster (Technical note 1).

The differences that remain are of two kinds. Some concern the boundary of the household: the catasto's fiscal hearth, the Ottoman administrative household, and the census households of Egypt and the Balkans draw that boundary by slightly different rules, and each rule shifts particular indicators in a direction that can be anticipated. Others concern recording practice: who was entered as head, how carefully ages were reported, and how completely girls and young women were counted. Both kinds are taken up where they bear on the results: the boundary of the household for the catasto and the Ottoman registers above and for the slaves of the Egyptian samples in Technical note 1, the recording of heads in Section 3.3, the counting of girls and young women in Section 6, and the quality of age reporting in Section 7. Neither kind is peculiar to the Mediterranean. Both have been confronted before in the harmonized European data, where the Mosaic team warned of the "epistemic risks" of comparing census units across cultures and recommended that analyses control for census quality and period, and where bootstrapped confidence intervals showed how quickly the sex ratio of small children becomes unstable as the number of children falls (Szołtysek et al. 2025). Following that advice, we treat each sample as one type of source within one window of enumeration, compare sex ratios through sample medians and not unit by unit, and control for the quality of age reporting, a proxy for the type of source, in the robustness checks below.

Our samples include the Mediterranean side of Spain, from Catalonia and the Ebro valley to Murcia, Almería, and Andalusia, but no southern Italy, no Maghreb, and no rural Anatolia, and these are not innocent gaps. Nuclear households prevailed in southern Portugal, Spain, and Italy at least from the early modern period, whereas central Italy, from which our Tuscan data come, remained the classic zone of the sharecropping "patriarchal" household into the twentieth century. In 1951, on Barbagli's reworking of the Italian census, the share of the population living in extended families approached or exceeded one half in the central regions, against fewer than one in five in the south (Barbagli 1984, as summarized by Sacchi and Viazzo 2018: 430–431). For Iberia, Rowland (2002: 69) summarized two decades of research in the same terms: complex households, mostly

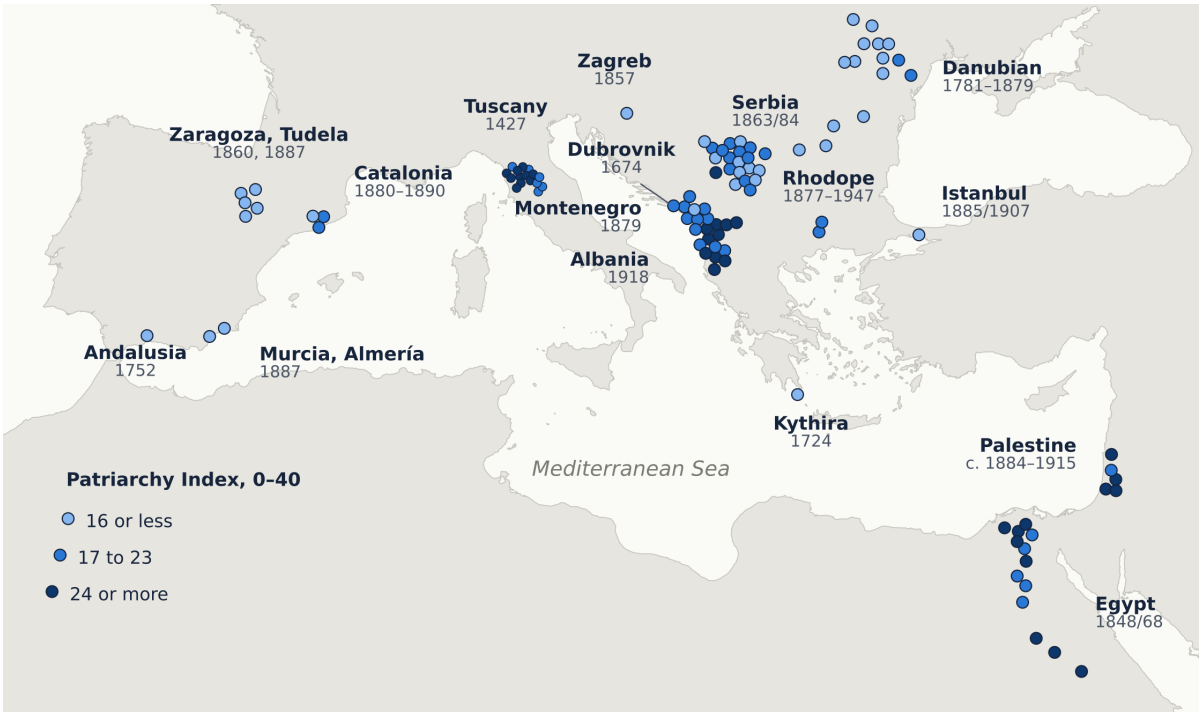
of a stem type quite unlike the joint families of Tuscany and the rest of Italy, were confined to the northern rim of the peninsula, while elsewhere, in Murcia, Madrid, or Andalusia, simple family households were the rule. Across the south of Portugal, Spain, and Italy, early female marriage went together with a nuclear family system (ibid.: 69 n. 15). The homogeneous Mediterranean of Smith (1981), which put Sicily with Bologna, Murcia with Galicia, and Corsica with Provence in one cultural region, was in Rowland's phrase "an artificial construct" (ibid.: 69). Our Spanish samples, discussed in Section 4, point the same way. Under the rule stated in Section 2, the Basque and Cantabrian populations of the census of 1887 and the three populations of southern France, all on the Atlantic side, remain in the European benchmark. The "rim" that emerges below is therefore a rim of the populations we observe, not of the whole littoral. A further limit concerns confession (Table 1). Our samples include Catholic Tuscany, Spain, Dubrovnik, and Zagreb; Orthodox Serbia, Montenegro, Kythira, and most of the Danubian listings; the Muslims of Istanbul; Muslim-majority Palestine and Egypt; and Albania, where a Muslim majority lived alongside Catholic and Orthodox minorities. Confession, like place, moves together with period and source across our samples, and none of them can yet be split by religion in the present analysis.

3.2 Units of analysis

Our unit of analysis is the regional population: all persons enumerated in one region in one source. The 108 units, mapped in Figure 2, range from 1,783 to 36,940 persons. They follow the rule by which the Mosaic database groups its settlements into regions (Szołtysek et al. 2025: 260–261), the rule that, with counties for the NAPP data, also defines the regions of the European benchmark (Szołtysek et al. 2026a: n. 6). A region corresponds to an administrative unit of the source, usually a county, or, where the source records none, to a geographical cluster. Urban and rural settlements are kept apart, a place counting as a town if the census takers classified it as one by its legal status at the time. Each region should count at least 2,000 inhabitants, a rule of thumb (Gruber and Szołtysek 2016, as applied in Szołtysek et al. 2026b) that three of our units miss narrowly, with 1,783 to 1,992 persons. The Tuscan data were grouped on these principles into sixteen regions, seven urban and nine rural. They comprise the city of Florence, the rural parts of the four quarters (Santo Spirito, Santa Croce, Santa Maria Novella, and San Giovanni) into which its contado was divided, and the towns surrounding Florence. For the rest of the Florentine state they are the city of Pisa and its countryside and the towns and countryside of four zones named by their direction from Florence: northwest, southwest, east (with the countryside of Arezzo), and southeast. Egypt enters as thirteen provinces, three of which combine two neighboring provinces of the original geography (Rosetta with Buhayra, Damietta with Daqahliya, Qina with Isna). Palestine enters as

five units: the rural north, center, and south, the towns of the north and center, and the town of Hebron. The western samples enter as the regions of the Mosaic file: Catalonia as one rural and two urban units, the province of Zaragoza as four districts, the census of 1887 as the towns of Vera, Mazarrón, and Tudela, and Andalusia in 1752 and the area of Dubrovnik in 1674 as one unit each. Where a source distinguishes towns, we code urban units separately; 37 of the 108 units are urban.

Figure 2: The 108 regional populations and their Patriarchy Index scores



Notes: Three levels of the index: 16 or less, 17 to 23, 24 or more. Each unit is placed at the center of its region: for Tuscany, Palestine, and Egypt, the population-weighted centroid of the localities enumerated in it (for Tuscany, villages as well as towns); elsewhere, the geocoded center of the region. Overlapping dots are displaced slightly. Albers equal-area projection. Anatolia outside Istanbul is not covered.

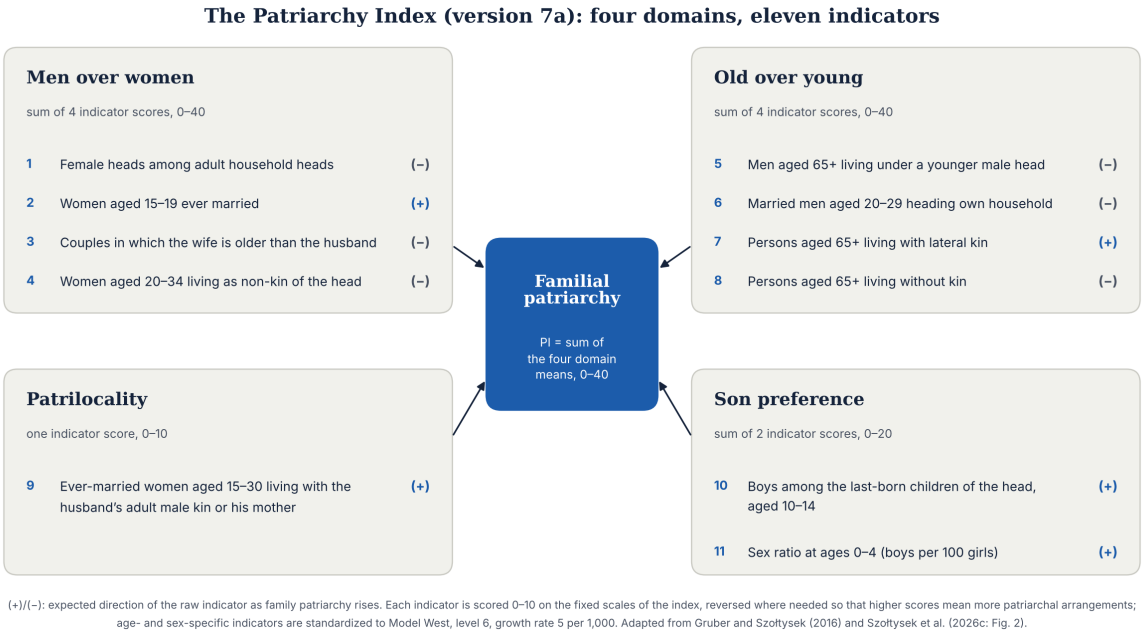
3.3 The Patriarchy Index

For each unit we compute the Patriarchy Index (PI), version 7a (Gruber and Szołtysek 2016; Szołtysek et al. 2017). The index starts from a property of its sources. Census and census-like microdata contain no direct measures of power, norms, or ideology, but they record in granular detail who lived with whom, in what relationship to the head, at what age, and in what marital status. Gruber and Szołtysek therefore translated the theoretical literature on family patriarchy into "census-derived signatures," formulated as eleven imperatives of patriarchal family organization (Szołtysek et al. 2026c: 8). In a patriarchal family, women do not head households. They marry early, often at or soon after puberty, and they are younger than their grooms and stay with their natal families until marriage. Young men do not become household heads while their seniors are alive,

sons of living fathers do not establish independent households, some men remain in the family household permanently, and the elderly are not left to care for themselves. At marriage, girls move into the household of their husband or father-in-law. Parents prefer to raise sons over daughters, and girls receive less care than boys. Where these features coalesce, they form not a set of scattered traits but one integrated structure of gender and generational inequality (ibid.).

Each imperative is captured by one indicator, and the eleven indicators, listed in Figure 3, are grouped into four domains: male domination (four indicators), generational domination (four), patrilocality (one), and son preference (two). The two son-preference indicators need a word of explanation, because they are the least self-evident; both are restricted to family households (Gruber and Szołtysek 2016). The first is the proportion of boys among the last-born children of household heads, observed at ages 10–14. It rests on the hypothesis that parents who have had a daughter are more likely to try for another child, so that where sons are preferred, boys are overrepresented among last-born children (cf. Larsen, Chung, and Das Gupta 1998); the restriction to ages 10–14 is a compromise between younger ages, at which the last child may not yet be the last, and older ones, at which children may already have left the parental household through marriage or service. The second is the sex ratio (boys per 100 girls) at ages 0–4, which rises where girls die more often than boys, where they are not registered, or both; the index does not distinguish between the two (Szołtysek et al. 2022).

Figure 3: Structure of the Patriarchy Index



Notes: Version 7a: four domains, eleven indicators, and the expected direction of each indicator as family patriarchy rises. Source: adapted from Gruber and Szołtysek (2016) and Szołtysek et al. (2026c: Fig. 2).

Each indicator is scored on an eleven-point scale from 0 to 10. The first nine are scaled against the highest possible outcome, with 0 for a natural lowest value, while the two son-preference indicators, whose ranges differ, take the neutral values of 0.51 and 105 as their minimum (Szołtysek et al. 2026c: 8). The scales are oriented so that higher scores always denote more patriarchal arrangements, whatever the expected sign of the raw indicator. The index is a nested average. In its standard notation each domain score is the sum of its indicator scores, so that male and generational domination range from 0 to 40, patrilocality from 0 to 10, and son preference from 0 to 20. The PI is the sum of the four domain means, each domain thus contributing up to 10 points to a total that runs from 0 to 40. Equal weights are given to the domains and to the indicators within them, because each domain contributes something the others do not and none can stand in for another. In the language of measurement theory, the PI is a hybrid, reflective-formative (Type II) construct (Becker, Klein, and Wetzels 2012): the indicators reflect their domains, while the domains jointly form the higher-order construct of familial patriarchy and need not be highly correlated with one another. Our analysis rests on two consequences of this design. The index is decomposable, so that any difference in the PI can be broken down exactly into the contributions of its domains. Because its cut points are fixed rather than relative to the populations at hand, it is also an absolute measure, comparable across populations and with every other study that uses the same instrument. Where we decompose the index we therefore work with the contributions of the domains, each domain's score divided by the number of its indicators, which we report in index points; where we describe a single domain we give its score. As in the files of the index, the PI of each unit is reported rounded half up to the nearest integer, while decompositions and regressions use the unrounded index.

Several indicators are defined over broad age ranges, so that two populations with identical family behavior could still obtain different scores because their age structures differ, for instance where high fertility swells the young age groups or high mortality thins the old. All age- and sex-specific components of the index are therefore standardized to a common stable population: Model West, mortality level 6, with a growth rate of 5 per 1,000 (Coale and Demeny 1983; Szołtysek and Gruber 2016; Szołtysek et al. 2026a). Model West was chosen because it draws on the largest number of life tables and is the most general of the four Coale–Demeny families (United Nations 1982: 12–13). Level 6 corresponds to a life expectancy at birth of 32.5 years for women and 30.1 years for men, broadly representative of European populations of the eighteenth and nineteenth centuries, and the growth rate approximates the European average between 1750 and 1950, 0.68 percent a year (Livi-Bacci 2012: 25; Szołtysek et al. 2026b: n. 3). The standard is a convention adopted for comparability, but it is not foreign to our Mediterranean populations: for the town of Hebron in the first decade of the twentieth century, the LOOP project estimates a life expectancy at birth of 34.7 years for women

and 36.4 years for men (Büssow 2026). Tuscany in 1427 probably lived under heavier mortality. In the Florentine family memoirs studied by Herlihy and Klapisch-Zuber (1985: 83–84), the average duration of life was about 24 years for those born or dying between 1401 and 1425 and about 28 years between 1426 and 1450, figures the authors regarded as an order of magnitude at best. The age pyramid of 1427, shaped by recurrent plague, fits no model life table (ibid.: 195). Level 6 thus implies lighter mortality than Tuscany probably knew in 1427, as it did for Rome, where Saller (1994: 23) treated it as the upper bound of probable life expectancy. The same standard, with the same weights, was applied to the European regions with which we compare our data below. The American study, by contrast, replaced it with Model West level 10 and a growth rate of 10 per 1,000 (Szołtysek et al. 2026b), and the Asian study standardized by the average age and sex structure of the national populations it covered (Szołtysek et al. 2026c). We therefore treat the American and Asian medians as indicative benchmarks: re-standardizing them with our weights would move them, but, we assume, not by enough to overturn the comparisons drawn in Section 4.

For Egypt, whose census samples record neither marital status nor group quarters, the computation required a reconstruction of marital status from the household roster and two small adaptations of the code. None of them changes the definition of an indicator; they are described in Technical note 1 at the end of the paper.

The index reads behavior rather than norms. It records who heads the household, how young brides are, whether wives are older than husbands, whether old men lose headship, whether young men set up their own households, whether brides move in with the groom's kin, and whether boys outnumber girls. It does not observe endogamy, dowry, inheritance, seclusion, or honor. This is a limitation, but also an advantage: the same indicators can be computed for Christian Florence, Muslim Istanbul, and the Orthodox Balkans from the same kind of evidence, without assuming that the meaning of any particular custom travels across them. The index also measures patriarchy in a deliberately narrow sense. Hunt (2018: 3) adopts as a working definition Merry Wiesner-Hanks's "social system in which men have more power and access to resources than women, and some men are dominant over other men"; our domains of male and generational domination correspond to its two clauses, observed within the household. Kaser and Halpern (1997: 63), writing of the Balkans, defined patriarchy in similar terms, as a value embedded in a social structure that takes both gender and age as its organizing principles. Hunt's objection that patriarchy so defined obscures other, intersecting relations of domination, between the married and the never-married or between the free and the enslaved, applies to our index as well, which registers such relations only where they leave a trace in co-residence.

Four features of the data shape the interpretation of everything that follows. First, as noted in Section 3.1, place, period, and type of source move together within each sample.

The window of enumeration is a single date in most cases, two censuses for Serbia and for Istanbul and Egypt, where the samples of the two censuses are pooled to enlarge them, a register window of up to two decades for each Palestinian unit, and several listings for the Rhodopes, for the Catholic communities of Moldavia, and for Catalonia. Differences between samples are therefore upper bounds on purely regional differences. Second, the sources differ in their registration conventions. Under Ottoman registration rules, for example, the head of a registered household was to be the senior male, even if he was an infant (Okawara 2003), and in the Egyptian census of 1848 a widow or divorced woman living with her children was recorded as head only if all of them were daughters (Fargues 2003). Both conventions depress female headship independently of family behavior. Third, the sources differ in the quality of age reporting. Spoorenberg's (2007) total modified Whipple index ranges from almost no heaping in the Palestinian registers, where ages are computed from the date of birth that the basic registers record for every person (Kilinç 2024), to heavy heaping in the Egyptian census samples, where they were stated. Fourth, every co-residence indicator depends on where the enumerator drew the boundary of the household. Kin who lived apart in the eyes of the census may have lived together in practice: in contemporary Egypt, older couples and their married children often occupy what the census records as separate households, divided by no more than a hallway or a staircase (Cuno 2008, cited in Sacchi and Viazzo 2018: 433). Wherever such arrangements were common, our measures understate the reach of the lineage. We return to the second and third points when we test the robustness of our results.

3.4 Five centuries in one cross-section

A title that runs from 1427 to 1918 invites a reading in time, and this paper offers none. Our sixteen samples are pooled into a single cross-section, and the comparison between them is a comparison of structures, not of dates. We follow the transtemporal design developed for the comparison of historical Europe with contemporary Asia, which, after Ruggles (2009, 2010), puts institutional and structural comparability before strict chronological alignment and rests on a concept of processual time. What is compared is the evolution of socioeconomic and demographic structures, which makes populations separated in space and time systematically comparable (Szołtysek et al. 2026a: 577). The design is as old as the comparative history of the family. Hajnal (1982: 476) built one of his two household formation systems on what he saw as a surprising likeness between the joint households of fifteenth-century Tuscany and those of contemporary India and China, setting the catasto of 1427 beside twentieth-century Asian evidence in one comparison. Laslett's (1983) sets of tendencies in European domestic organization joined listings from different centuries in the same way.

Three properties of our populations license the procedure here, as the corresponding properties licensed it for Europe and Asia (Szołtysek et al. 2026a: 584–585). First, all of them were kinship-based societies in which the family and the domestic group regulated gender relations and social reproduction. With the exception of Muslim Istanbul, where Duben and Behar (1991) found parity-specific family limitation and a total fertility rate of about 3.9 already in the late nineteenth century, and perhaps of Catalonia in the 1880s, an early case of fertility decline in Spain, none had begun the fertility transition. The standardization of the index to a common stable population removes the differences of age structure that remain. Second, the index is an absolute measure with fixed cut points, computed by the same code for every sample, so that a given indicator score denotes the same arrangement of co-residence in 1427 and in 1918, even though the same total can, as Section 5 shows, be reached by different combinations of domains. Third, nothing in the design assumes that the samples form a sequence. A crude temporal ordering of the European and Asian data showed that no linear developmental stages of patriarchy can be inferred from them (ibid.: 608 n. 15), and our own samples point the same way. The earliest of them, Tuscany in 1427, and the most recent census, Albania in 1918, both belong to the high rim, while Muslim Istanbul in 1885 and 1907 and the Palestinian registers of the same decades lie twelve points apart. The two early-modern listings of the Adriatic and the western shore, Dubrovnik in 1674 (20) and Andalusia in 1752 (10), lie ten points apart. Because place, period, and source move together within each sample, nothing we say about the rim and the interior is a statement about change. Whether the configurations we describe persisted, and for how long, is a question for data that observe the same populations at several dates.

4 How distinctive was the Mediterranean?

The first implication of the Mediterranean hypothesis is the easiest to test, because the Patriarchy Index has by now been computed with the same indicators and fixed scales for several large populations outside the region. Our principal yardstick is historical Europe. For this paper, the regional populations of the Mosaic and North Atlantic Population Project (NAPP) collections were recomputed with the same code and the same age-standardization weights as our Mediterranean units. The resulting file holds 320 regional populations observed between 1685 and 1926, from Ireland, Iceland, and Scandinavia to the Urals and Siberia, and from the North Sea to the Bay of Biscay: 132 regions from Mosaic and 188 counties from the full-count censuses of Britain, Ireland, Denmark, Norway, Sweden, and Iceland taken between 1880 and 1901. The Balkan populations of Mosaic, which form part of our own data (provided by Siegfried Gruber), were excluded from the European file, as were the twelve western populations that we

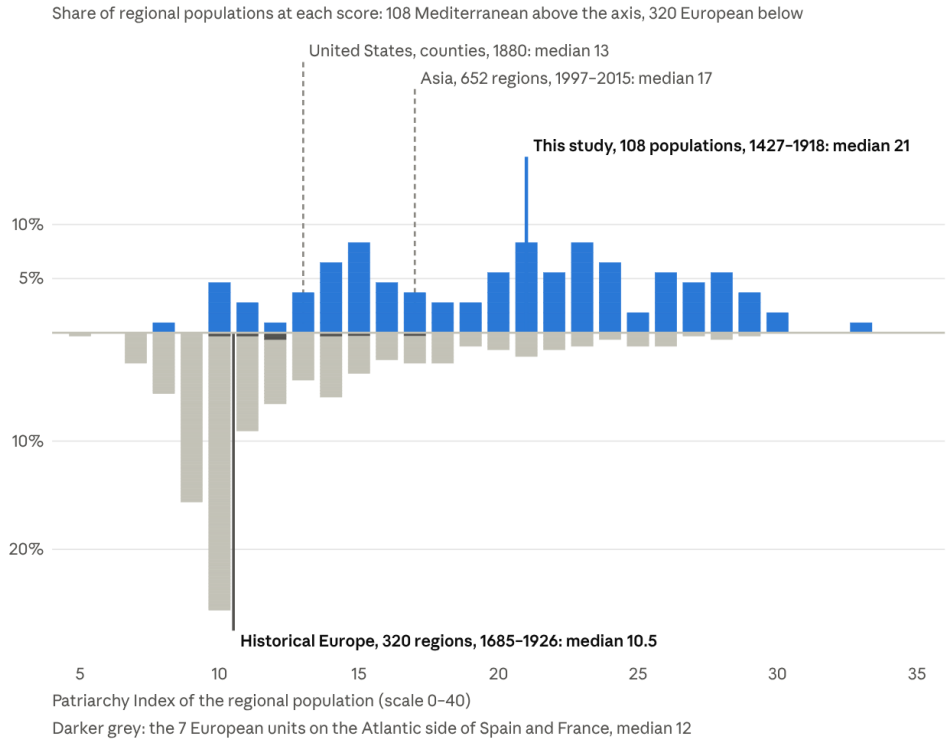
count as Mediterranean, so that none of its populations belongs to the sixteen samples analyzed here and the two distributions are independent.

The European median is 10.5, with an interquartile range from 10 to 14; the published median for a related set of 311 regions is 12 (Szołtysek et al. 2026a). Two further benchmarks use the same indicators but a different standard population. For the United States, the county-level PI computed from the full-count census of 1880 has a median and mode of 13, with more than 98 percent of counties falling between 11 and 16 (Szołtysek et al. 2026b). For Asia, the index computed from IPUMS-International census samples taken between 1997 and 2015 for 652 subnational units in 22 countries, Egypt included, has a median of 17 and a maximum of 30 (Szołtysek et al. 2026c). The last benchmark is deliberately anachronistic: it represents the "classic patriarchal belt" in the census era, and it provides the most demanding standard against which a historical population can be called highly patriarchal.

Against these yardsticks, the historical Mediterranean stands out clearly (Figure 4). The median of our 108 regional populations is 21, and its interquartile range, from 15 to 24, lies wholly above the European one: the lower quartile of the Mediterranean distribution is higher than the upper quartile of the European. Only six Mediterranean units, Zagreb in 1857 and five Spanish populations of Andalusia, Almería, Navarre, and Aragon, fall to the European median or below, whereas only 30 of the 320 European regions, or 9 percent, reach the Mediterranean median. A Mediterranean population drawn at random outscores a European region drawn at random in 85 percent of pairs. This is the probability of superiority, or common-language effect size (McGraw and Wong 1992): every one of our 108 units is compared with every one of the 320 European regions on the unrounded index (34,560 pairs in all), and ties, fewer than one pair in a hundred (0.8 percent), count as half a win. The statistic equals the Mann–Whitney U divided by the number of pairs and reads as the probability that a unit drawn at random from one distribution exceeds a unit drawn from the other; two indistinguishable distributions would give 0.5. Resampling units gives a 95 percent interval of 0.81 to 0.89; resampling whole samples on our side and whole countries on the European side (16 and 24 clusters), which allows for the clustering of units within sources, widens it to 0.68 to 0.95. Seventy-three of the 108 units, or 68 percent, reach or exceed the median Asian region of the late twentieth century, and the highland Albanian district of Puka in 1918, at 33, scores above every one of the 652 Asian regions and every one of the 320 European ones.

The comparison also shows where the difference lies. Averaged over all units, the Mediterranean exceeds historical Europe by 7.7 index points; male domination and patrilocality contribute about a third each, generational domination and son preference about a sixth each (Table 2). More telling are the European regions that do reach Mediterranean levels. All 23 of them lie in the east, in present-day Russia, Belarus, and Ukraine. Eighteen come from the Russian household census of 1710 (perepis' 1710

Figure 4: Distribution of the Patriarchy Index in the Mediterranean and in historical Europe



Notes: The 108 Mediterranean regional populations above the axis and 320 regional populations of historical Europe below it, both computed with the same code and standardization. Bars show the share of units at each integer score; darker grey marks the seven Atlantic units of Spain and southern France. Dashed lines: the medians of the American and Asian benchmarks (Szołtysek et al. 2026b, 2026c).

goda), whose instructions ordered the clerks to register in every house all persons of both sexes "by name and by age, omitting no one, not even the smallest infants," on pain of death for concealment (Mogil'nikov and Boiarshinov n.d.: fol. 1; our translation). At a similar height (a mean of 24.4, against 25.3 for the 48 Mediterranean units that score 22 or more), they are built differently. Measured by their contributions to the index, the lineage domains[7] are stronger in the European east, by about one point each for generational domination and patrilocality, while the Mediterranean populations lead in male domination, by 1.5 points, and in son preference, by 1.8. Behind these differences lie the same features that will separate the rim from the Balkan interior below. In the Mediterranean, daughters became wives earlier (a median of 39 percent of women aged 15–19 ever married in the high-scoring Mediterranean units, against 16 percent in their eastern European counterparts), wives were more rarely older than their husbands (about 6 against 18 percent of couples), and boys outnumbered girls among small children (a

[7]We call generational domination and patrilocality together the lineage domains, because both register the hold of the male line over co-residence: whether old men keep the headship, whether young married men set up households of their own, whether the elderly live with lateral kin or alone, and whether young wives live with their husband's kin. Male domination and son preference, by contrast, register the position of daughters and wives.

median of 110 per 100 at ages 0–4, against 102). High family patriarchy was thus not peculiar to the Mediterranean; the early marriage of daughters and the deficit of girls were.

Table 2: Mean domain scores of the Mediterranean units and the European regions, for all units and for those whose rounded PI is 22 or more

Domain (scale)	Mediter-ranean, all units	Europe, all regions	Difference (share of gap)	Mediter-ranean, PI 22 or more	Europe, PI 22 or more
Number of units	108	320		48	23
Male domination (0–40)	28.98	18.73	+10.25 (33%)	32.00	26.22
Generational domination (0–40)	26.06	20.72	+5.34 (17%)	30.60	34.87
Patrilocality (0–10)	4.69	2.20	+2.49 (32%)	6.98	8.22
Son preference (0–20)	3.23	0.67	+2.56 (17%)	5.40	1.83
Patriarchy Index (0–40)	20.06	12.40	+7.66 (100%)	25.33	24.40

Notes: Domain scores in the standard notation of the index, the sum of the domain's indicator scores; both files computed with the same code and the same standardization. Because the index is the sum of the four domain means, a domain's share of the gap is its difference divided by the number of its indicators, as a share of the difference in the index, and the shares decompose that difference exactly (they do not sum to 100 because of rounding). All 23 European regions scoring 22 or more lie in present-day Russia, Belarus, and Ukraine.

The western shore does not resemble our rim. The eleven Spanish units, some 86,000 persons from four sources, score between 10 and 18, with a median of 11. From Andalusia and the towns of Vera and Mazarrón on the coast of Almería and Murcia to Aragon and Tudela on the Ebro, they score 10 to 14, the level of Norwegian counties in 1900; only Catalonia, at 14 to 18, reaches the level of Serbia. The difference lies where it lies between the rim and Europe: no more than 12 percent of women aged 15–19 had married, against 39 to 45 percent in the rim villages, and 9 to 22 percent of wives were older than their husbands. Within Spain, Rowland's (2002: 69) geography reappears: Catalonia, on the northern rim of the peninsula to which he confined the complex households of a stem type, scores highest, with generational domination of 22 to 23 out of 40, and the south and southeast, where he found simple family households to be the rule, score lowest. The Atlantic populations left in the European file look the same, the Basque and Cantabrian towns of 1887 at 10 to 12 and the three French units at 14 to 17. The area of Dubrovnik in 1674, at 20, is the only western or Adriatic unit that would not look out of place in the Balkan interior, and its profile is the interior's as well: generational domination of 31 out of 40, but only 5.5 percent of women aged 15–19 married, 22 percent of wives older than their husbands, and no son preference. This is what one would expect from Kaser's (1996: 383) placement of Dalmatia in the northern variant of the Balkan patrilocal household-cycle system, where scarcity of land kept married sons together, and from the early traces

of the extended family that Gavazzi (1982: 90) found in Dalmatian documents and in the notarial records of Dubrovnik. The western shore of the sea thus bears out what Sacchi and Viazzo (2018) inferred from the household literature: the high-patriarchy Mediterranean we observe is a Mediterranean of the east and south, not of the whole littoral.

The size of the gap depends, first, on the composition of the European distribution. The 188 counties from the North Atlantic censuses of 1880–1901 have a median of 10, the 132 Mosaic regions one of 15, and the 91 European regions observed before 1850, among them most of the Russian east, one of 16. Against each of these subsets the Mediterranean median stands 5 to 11 points higher, and a Mediterranean population outscores a European one in 96 percent of random pairs against the North Atlantic counties, 70 percent against the Mosaic regions, and 67 percent against the regions observed before 1850. The contrast narrows when the comparison is confined to earlier and more easterly European populations, but it does not disappear. Second, the American and Asian benchmarks standardize the age-specific indicators to other standard populations (Model West level 10 with a growth rate of 10 per 1,000 for the United States, the average age and sex structure of the national populations for Asia), so that their medians are only indicative; the European comparison, computed with the same weights as ours, is not affected. Neither caveat alters the order of magnitude of the difference: a gap of more than ten index points between the Mediterranean and European medians is twice as wide as the five-point band within which almost all American counties fell in 1880. The result also differs from what comparative research has found for family values today: the distinctiveness of contemporary Mediterranean familism, Calzada and Brooks (2013: 523) report, "recedes considerably" once Eastern Europe and non-European societies enter the comparison, whereas the historical Mediterranean of family behavior keeps its lead even against the most demanding benchmark available to us.

The boundary of the region itself matters as well. No single rule fits every definition of the Mediterranean, and Table 3 therefore reports the results under seven. Two are the populations as sampled and our primary set. Two more widen the primary set, one by the three populations of southern France, the other by taking Tillion's countries whole, the Atlantic side of Spain and France included. The remaining three narrow it: the countries Tillion named, which drops the Danubian, Rhodope, and Istanbul samples; the Mediterranean drainage basin, which drops the Serbian, Danubian, and Zagreb samples and the Montenegrin unit of Old Herzegovina; and a littoral Mediterranean of the coastal samples, the Montenegrin Littoral, the seven coastal Albanian units, the Mediterranean coast of Spain, and Dubrovnik. Under every definition the Mediterranean outscores Europe in 84 to 91 percent of random pairs, the four domains contribute to its lead in nearly the same proportions, and more than seven tenths of its inequality lies between samples. Nor does the high level come from the Balkan hinterland: without the Albanian,

Montenegrin, and Serbian samples the median falls only from 21 to 20.5, and without any Balkan sample it rises to 23. The coast makes little difference within the Balkan samples either. Stoianovich placed the largest households of the western Balkans in the mountains and "the lowest rate" on "the coastal sites of the Adriatic" (Kaser 1994a: 251). In the index, however, the seven Albanian units whose centers lie within 25 kilometers of the sea have a median of 26 and the seven others one of 25.5, and the Montenegrin Littoral, at 21, scores like the inland nahije (20 to 22).

Table 3: The Mediterranean under seven definitions

Definition	Units (samples)	Median PI (IQR)	Europe: regions, median	Probability of superiority (95% interval)	Shares of the lead: male, generational, patrilocality, son preference (%)	Between samples (%)
D0. As sampled	96 (11)	21.5 (16–25.25)	332, 11	0.89 (0.85–0.92)	33, 17, 33, 16	72
D1. Primary set: D0 with Mediterranean Spain and Dubrovnik	108 (16)	21 (15–24)	320, 10.5	0.85 (0.81–0.89)	33, 17, 32, 17	79
D2. D1 with southern France	111 (17)	21 (15–24)	317, 10	0.85 (0.82–0.89)	33, 17, 32, 17	79
D3. Tillion's countries taken whole: D0 with all nineteen western units	115 (17)	20 (15–24)	313, 10	0.84 (0.80–0.88)	33, 17, 32, 17	81
D4. Countries named by Tillion: D1 without the Danubian, Rhodope, and Istanbul samples	90 (13)	22 (17–26)	320, 10.5	0.87 (0.83–0.91)	29, 18, 36, 16	76
D5. Mediterranean drainage basin: D1 without Serbia, the Danubian plain, Zagreb, and Old Herzegovina	70 (13)	23 (20–26.75)	320, 10.5	0.89 (0.84–0.93)	28, 19, 35, 18	80
D6. Littoral: coastal samples, Montenegrin Littoral, coastal Albania, Mediterranean coast of Spain, Dubrovnik	51 (11)	24 (21–27)	325, 10	0.91 (0.87–0.95)	28, 18, 35, 19	77

Notes: Medians and quartiles of the rounded PI; probabilities of superiority on the unrounded index, with 95 percent intervals from 2,000 bootstrap resamples of units (for D1, resampling whole samples and whole countries instead, 16 and 24 clusters, widens the interval to 0.68–0.95). Shares of the lead: each domain's contribution to the difference between the Mediterranean and European means. Inequality between samples: the between-sample share of the Theil index. D1 is the set used throughout the paper.

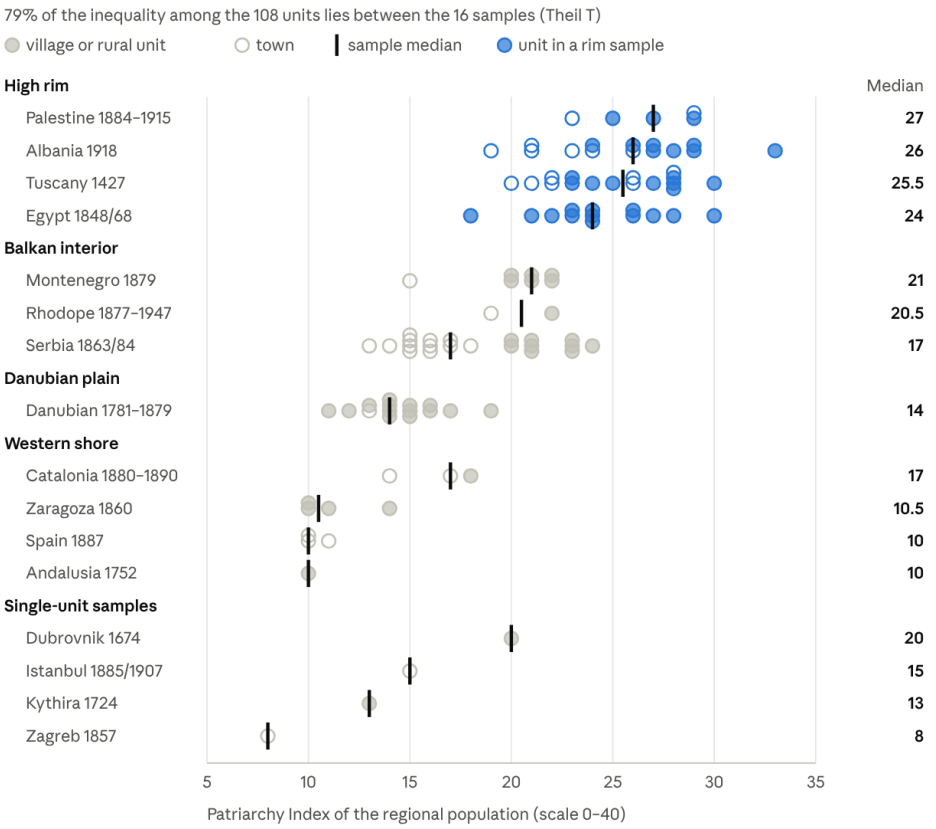
Behind the level, however, lies a range as wide as that of all 320 European regions: the Mediterranean populations run from 8 in Zagreb to 33 in Puka, against 5 to 29 in Europe. A region in which the least and most patriarchal populations differ by twenty-five index points is not obviously a single family system, and the question of how this variation is structured is the subject of the next section.

5 One system or several?

A single patriarchal system would leave its populations differing in degree, with most of the variation within its regional samples. Neither expectation holds: ordered by their median scores, the samples fall into four broad groups (Figure 5). A high rim, formed

by Palestine (median 27), Albania (26), Tuscany (25.5), and Egypt (24), stands clearly above a Balkan interior consisting of Montenegro (21), the Rhodopes (20.5), and Serbia (17), and above two lower groups: the Danubian plain (14) and the western shore, where Catalonia (17) stands above Aragon (10.5), the towns of the 1887 census (10), and Andalusia in 1752 (10). Of the four single-unit samples, Istanbul (15), Kythira (13), and Zagreb (8) fall at or below the level of the plain, and Dubrovnik (20) at the level of the interior. These groups are descriptive cuts read off the sample medians, not the result of a clustering procedure, and we do not attach any typological meaning to them.

Figure 5: Patriarchy Index of the 108 units by sample



Notes: Samples are grouped by the descriptive cuts used in the text and ordered by their median within each group.

A Theil decomposition of the 108 index values confirms that the differences between samples dominate the picture: about 79 percent of the total inequality in the PI lies between the sixteen samples (79 percent without Istanbul), compared with about 7 percent between urban and rural units. Because each sample is also a single type of source within a single window of enumeration, this share is an upper bound on purely regional variation; some of it reflects differences in period and in recording practice. Even so, the rank order of the samples is not what a model of a common Mediterranean patriarchy, weakening from a core toward its periphery, would predict. It recalls instead the household formation systems that Kaser (1996: 380–383) distinguished in southeast-

ern Europe: the Danubian plain, the lowest of our Balkan samples, was the home of the Romanian neolocal-nuclear system, while Albania, Montenegro, and most of Serbia belonged to the patrilocal household-cycle system of the western and central Balkans.

Istanbul makes the point most clearly. The Muslim population of the Ottoman capital, observed in the censuses of 1885 and 1907, which we pool into one sample to enlarge it, scores 15, at the level of the Danubian plain and far below the 23 to 29 points recorded in the rural and urban populations of Ottoman Palestine in the same decades. Within one empire and one religion, the capital and its Palestinian provinces differ by eight to fourteen points, more than the distance between the Mediterranean and the historical European medians. The Istanbul profile is distinctive mainly in its low patrilocality (2 points out of 10 against an overall mean of 5.0) and its near absence of son preference (1 point out of 20). Its index is that of the Balkan towns of the period: the town unit of Montenegro in 1879 also scores 15, and the twelve Serbian town units of 1863 and 1884 have a median of 15.4. This bears out, in measured form, the conclusion of Duben and Behar (1991) that the city's Muslim households followed "a north-east Mediterranean/Balkan urban" pattern rather than the joint-family system of rural Anatolia, and it fits Kaser's (2008: 274) observation that relatively gender-symmetric enclaves appeared early "where commerce and capitalism developed," in "mega-cities" such as Istanbul or Athens. Kythira, a Venetian island in the Ionian Sea, makes it too: in 1724 it scores only 13. Even the littoral does not behave as one region, as the Spanish samples confirm on its western shore.

Confession does not sort the samples either. Within Islam, Palestine (median 27) and Egypt (24) stand nine to twelve points above Muslim Istanbul (15); within Latin Christianity, Tuscany in 1427 (25.5) stands more than seventeen points above Catholic Zagreb in 1857 (8), with Dubrovnik (20) and the Spanish samples (10 to 17) between them; within Orthodoxy, Montenegro (21) and Serbia (17) stand four to eight points above Kythira (13). The rim itself joins a Catholic population, two Muslim-majority populations, and Albania, where Muslims lived alongside Catholic and Orthodox minorities. This is consistent with Tillion's insistence that the frontiers of the phenomenon "are not those of the Muslim religion," but it is a comparison between samples, in which confession moves together with period, source, and urbanization. The sharper test, a comparison by confession within one source, will be possible where the microdata record religion for every individual, as the Egyptian registers of 1848 did (Fargues 2003), but it lies beyond the scope of this paper.

The ranking of the samples can also be set against the one systematic attempt to map family systems across the Old World from the ethnographic record. Coding the domestic cycles of some two hundred human groups, Sagart and Todd (1992: 161) found a continuous zone of patrilineal communal families stretching from the Baltic to Vietnam, from northern Siberia to Arabia, and from India to the Maghreb, with only three pockets

outside it. The first, in central Italy, they judged not clearly different from the communal zone of the Serbs, Montenegrins, Bosnians, and Albanians across the Adriatic. Around that zone they placed a periphery of nuclear and stem families that took in the upper Nile valley, southwestern Turkey, and maritime Greece (ibid.: 162), and they counted Greece and western Croatia among the nuclear areas along its European border (ibid.: 166). Much of this geography agrees with our measurements: Tuscany belongs with Albania and Montenegro, and Venetian Kythira and Habsburg Zagreb score at the bottom of our range. In 1848, however, the provinces of Upper Egypt were no nuclear periphery: Girga (30) and Qina with Isna (27) score highest of all the Egyptian units, and they do so in the lineage domains as well, with patrilocality scores of 9 and 8 against an Egyptian median of 7. Sagart and Todd relied for Upper Egypt on ethnography and on the census of 1960, which in their reading showed households to be clearly more nuclear throughout Upper Egypt (ibid.: 173), while the Ethnographic Atlas, whose Egyptian fellahin are located in Upper Egypt, codes them with small extended households (D-PLACE n.d.). The disagreement is probably one of date, not of evidence, for the ethnographic maps of family systems are, for the most part, maps of the twentieth century.

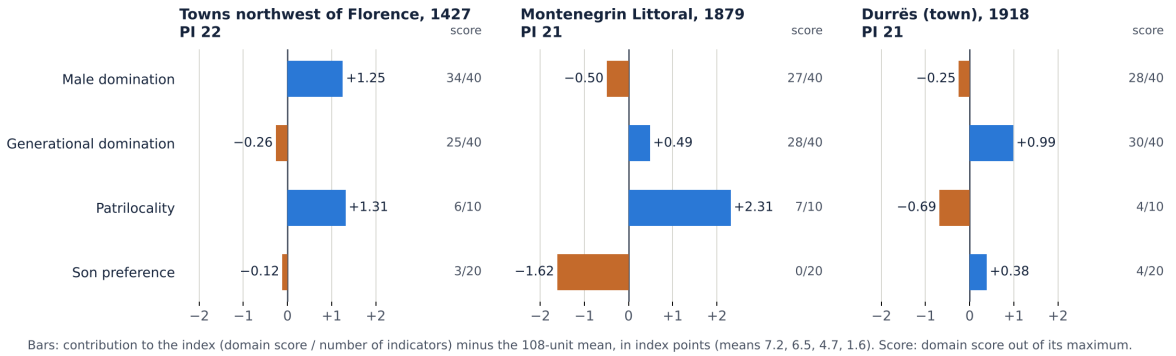
The ranking can also be set against the present. Across our sixteen samples, the rank correlation between a sample's median Patriarchy Index and the 2017 Patrilineal/Fraternal Syndrome score of its present-day state (Section 1) is 0.69 without Tuscany and 0.47 with it, for the Tuscan score of 1427 is set against one of the lowest present-day scores, Italy's.[8]

The second expectation of the Mediterranean hypothesis concerns not the level of patriarchy but its composition. A single system should produce similar profiles across the four domains at any given level. To examine this, we compare populations with nearly identical overall scores and ask whether they reach those scores in the same way. Among all sets of three units drawn from three different samples whose PI differs by no more than one point, the set formed by the towns of northwestern Tuscany in 1427 (PI 22), the Montenegrin Littoral in 1879 (21), and the Albanian port town of Durrës in 1918 (21) is among the most contrasting (Figure 6). The mean contributions of the four domains to the index across all 108 populations are 7.2 points for male domination, 6.5 for generational domination, 4.7 for patrilocality, and 1.6 for son preference. Relative to these, the Tuscan towns owe their score to male domination and patrilocality (about one point above the mean in each), the Montenegrin Littoral to patrilocality (two points above the mean) despite the complete absence of son preference, and Durrës to generational domination, with patrilocality seven tenths of a point below the mean. That similar totals can conceal different routes is the practical content of Micheli's (2018: 4)

[8]With sixteen points and modern borders the coefficient is illustrative; the Danubian sample is set at the mean of Romania and Moldova, the Spanish samples at the score of Spain, and Dubrovnik at that of Croatia.

warning that gradients are not typologies, since an intermediate value on a single scale reveals nothing new. The domain profiles are the minimal step beyond the gradient; we do not take the further step to a typology here.

Figure 6: Three routes to the same score



Notes: Contributions of the four domains to the index in the towns northwest of Florence in 1427 (PI 22), the Montenegrin Littoral in 1879 (21), and the town of Durrës in 1918 (21), shown as deviations from the mean of all 108 units, in index points. Blue bars lie above the mean, orange bars below it, and the figures at the right of each panel are the domain scores themselves, out of 40 for male and generational domination, 10 for patrilocality, and 20 for son preference.

The contrast between towns and villages points in the same direction from another angle (Table 4). In every sample that contains both, urban units score lower than rural ones. The difference, however, comes almost entirely from the lineage domains, generational domination and patrilocality. Male domination changes by less than one point in either direction, while the lineage domains fall by up to six and a half points.

Table 4: Rural and urban units within samples

Sample	Rural units	Urban units	Rural mean PI	Urban mean PI	Change in male domination	Change in lineage domains
Albania	8	6	27.8	22.1	−0.9	−3.2
Palestine	3	2	26.8	26.1	+0.9	−0.7
Tuscany	9	7	25.9	23.3	−0.4	−2.2
Rhodope	1	1	21.8	18.5	0.0	−1.8
Serbia	9	12	21.6	15.5	−0.2	−6.6
Montenegro	6	1	21.1	15.0	−0.5	−5.1
Catalonia	1	2	18.3	15.6	−0.5	−1.4
Danubian	14	1	14.5	13.3	−0.5	−0.4

Notes: Means of unrounded PI; changes are urban minus rural means, in index points. Changes in the domains are changes in their contributions to the index; lineage domains = generational domination plus patrilocality. Samples without both rural and urban units are omitted.

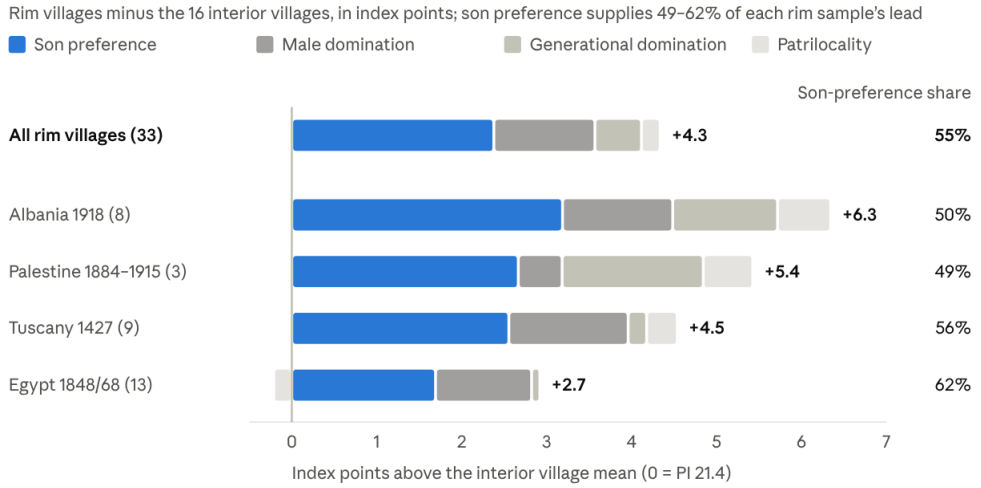
Towns, then, loosened the lineage rather than the husband. The finding echoes Herlihy and Klapisch-Zuber's observation that in 1427 the patriarchal household, which "subjects to the authority of an aged man one or more married couples of the following generation, forms a third of all peasant hearths, but only one-fifth in the city." Indicators of co-residence, however, depend on demography as well as on norms: where men married late and died early, fewer young men had a living father with whom to share a roof. Saller's (1994: 66) microsimulation of the Roman kinship universe showed that the proportion of twenty-year-olds with a living father depended more on the age at which men married than on life expectancy. Szołtysek (2015, 1: ch. 5 and secs. 9.10 and 10.11) used microsimulation to separate such demographic constraints from residential rules in headship succession and in the stem- and joint-family arrangements of Poland–Lithuania. The town–village contrast thus tells us where co-residence differed, not necessarily that urban norms of authority were weaker. Palestine is the exception to the general rule: the town of Hebron scores 29, as high as the surrounding countryside, and its urban units show slightly more male domination than its villages. Catalonia and Tuscany come next: among the samples with several towns, their rural–urban differences, under three points, are the smallest after Palestine's, against about six points in Albania and Serbia; the Montenegrin, Rhodope, and Danubian samples have one town unit each. Within the Tuscan countryside, too, the household regime varied little with the economic setting. Comparing the smallholders of the Val di Cecina with the sharecroppers of the Florentine quarter of Santa Maria Novella, Emigh (1997: 625–626) found 33 and 42 percent of individuals living in vertically extended or joint households and mean maternal ages at first birth of 20.9 and 21.0 years. The authority of the male head, "customarily transferred to the coresident male offspring only upon the death of the elder" (ibid.: 621), was common to both tenures. Law and custom pointed the same way: married couples ordinarily began life in the household of the husband's father, and married sons, however old, remained under their father's power (patria potestas) for as long as he lived (Kirshner 2015: 7, 11).

6 What separates the rim from the interior

The most consequential contrast in our data is the one between the high rim and the Balkan interior, and it is also the one most exposed to the objection that towns and villages are unevenly distributed across samples. We therefore compare village with village. The 33 rural units of the rim (Albania 8, Palestine 3, Tuscany 9, Egypt 13) have a mean PI of 25.7; the 16 rural units of the interior (Montenegro 6, the Rhodopes 1, Serbia 9) have a mean of 21.4. Because the unrounded index is the sum of the four domain contributions and a difference of means is linear, the village gap of 4.3 points

can be decomposed exactly into domain contributions (Figure 7).

Figure 7: Decomposition of the village gap between the rim and the Balkan interior



Notes: The gap is decomposed into the four domains of the index, pooled and by rim sample. Bars show the difference between the mean contributions of the four domains to the index in each group of rim villages (33 in all) and in the 16 interior villages, in index points.

Son preference contributes 2.4 points, or 55 percent of the gap, and male domination 1.2 points, or 27 percent. Generational domination (0.5) and patrilocality (0.2) together account for less than a fifth. The pattern is not an artifact of pooling: son preference supplies between half and three fifths of each rim sample's own lead over the interior villages, from 49 percent in Palestine and 50 percent in Albania to 56 percent in Tuscany and 62 percent in Egypt. The only notable deviation is Palestine, whose lead of 5.4 points includes 1.7 points of generational domination.

The rim and the interior thus organized co-residence around the male line in broadly similar ways and differed in how early daughters married and in how many girls appear among young children. The similarity in household structure should not be mistaken for an identity of kinship systems. The lineages of the Arab world were endogamous, those of the Dinaric highlands exogamous as a rule, as Kosven (1963) emphasized for the Montenegrin and Serbian brotherhood (bratstvo), and as Courbage and Todd (2011) found for the Muslims of Albania and Bosnia. The same household structure could thus coexist with opposite marriage rules. Within the Balkans, moreover, the line between the rim and the interior runs through a single household formation system. Albania, Montenegro, and most of Serbia all belong to what Kaser (1996: 383) called the patrilocal household-cycle system, whose southern variant carried the cultural complex of "Balkan patriarchy": strong blood ties, ancestor worship, patrilineal descent and kinship, patrilocal residence, bride-price, and the blood feud. In that order, as Kaser (1994b: 73) described it, house and land could be held only collectively by the men of the household, a woman could never own or inherit them and could head a household only as a widow,

a daughter married out into the house of her husband's father, and the bride was paid for. Patrilineality, he noted, usually goes with bride-price and bilaterality with dowry. Kaser placed Albania, Montenegro, and Serbia alike within this patrilineal zone (ibid.), and yet our samples from the three fall on both sides of the line between the rim and the interior. What separated wives in the two zones was above all the age at which daughters became wives. The male-domination component of the gap comes almost entirely from the proportion of women aged 15–19 who had ever married: in the rim villages it ranged from 39 percent in Albania and 40 percent in Tuscany to 43 percent in Palestine and 45 percent in Egypt, against 9 percent in Montenegro, 13 percent in Serbia, and 17 percent in the Rhodopes. Female headship, by contrast, does not separate the two zones.

Here the critique of Armstrong-Partida and McDonough (2023) bites, because an unrecorded unmarried woman raises the proportion of teenage wives and lowers the proportion of women living as non-kin. The catasto shows the problem where they would expect it. In the city of Florence, men outnumber women by 124 to 100 at ages 15–19 and by 138 to 100 at ages 20–34, and only 2 percent of women aged 20–34 appear as non-kin of their household head. Yet Herlihy and Klapisch-Zuber (1985) note that many rural girls entered household service in the city and that "the census takers observed women only casually because they were not subject to the head tax." In the countryside, sex ratios are a poorer guide, because the same tax gave households a motive to conceal boys and young men. The ages of girls were misstated as well, but in a direction that works against our result: fathers kept their nubile daughters at about eighteen, the modal age of first marriage, and households in the countryside reported adolescent sons as girls once the boys reached the age of the head tax (Herlihy and Klapisch-Zuber 1985: 141). Both practices keep unmarried girls in the 15–19 group and so, if anything, understate the share of teenagers already married. We therefore bound the problem from the city. If every man in excess of parity in Florence were matched by an omitted, never-married woman living as non-kin, the city's male-domination score would fall from 32 to 27 points out of 40, and its index by 1.25 points (Technical note 2). Applying a correction of that size to the index of every Tuscan village, a deliberately extreme assumption, lowers Tuscany's lead over the interior villages from 4.5 to 3.3 points and the pooled village gap from 4.3 to 4.0. The critique thus qualifies the Tuscan level but not the contrast. The year 1427 also caught Tuscany at a particular moment: between 1427 and 1480, Herlihy and Klapisch-Zuber found, Florentine girls delayed their marriages by a further three years.

The son-preference component rests on the sex composition of young children as the sources recorded it, and that record cannot be taken at face value. The median ratio of boys to girls aged 0–4 is 119 in Tuscany and 117 in both Palestine and Albania, against 103 in Montenegro and Serbia and 100 in Egypt. Ratios of this magnitude admit two readings. Either daughters were neglected, so that excess female mortality thinned their

ranks, or daughters were not counted, because household heads and clerks omitted them. Both are patriarchal practices, but they are different claims, and census data alone cannot settle between them, although they can narrow the choice. The procedure we developed for the European data predicts each population's child sex ratio from its infant mortality and from indicators of census quality, and flags only the populations whose bootstrapped lower bound lies above that prediction; in that comparison the Albanian census of 1918, the source we use here, showed the largest unexplained excess in historical Europe (Szołtysek et al. 2022). Where deaths were registered, the question can be put from the other side. An under-registration of girls would raise child sex ratios but lower measured female mortality, so the excess female deaths that Beltrán Tapia and Cappelli (2024) find in the vital statistics of Liberal Italy, where some 2 to 3 percent of girls went missing between 1861 and 1921, point to neglect; Beltrán Tapia and Raftakis (2022) reach the same conclusion for nineteenth-century Greece.

Our sources record no deaths, but the age pattern of the sex ratio offers a weaker test of the same kind, since girls omitted in infancy should reappear at later ages while girls who died should not (Szołtysek et al. 2022). Pooling the units of each sample, the excess of boys in Tuscany and Albania is present from the first year of life and persists through childhood: 120 boys per 100 girls at ages 0–4 in both, and 126 and 120 at ages 5–9, as neglect, or an omission of daughters at every age, would produce. In Palestine it is confined to infancy: 153 boys per 100 girls under the age of one (95 percent interval 125 to 186, on 407 infants), but 105 at ages 1–4 and 107 at ages 5–9, the signature of daughters left out of the count in their first year of life, not of daughters who died. Because our cross-section keeps only the persons entered at the opening of each register (Section 3.1), the excess measures omission at the enumeration, as it would in a census, apart from the few children born in the year of the opening whom missing registration dates do not allow us to separate. The registers also show that the omission continued after the count. Among the children born after the year of the opening and entered later, there are 116 boys per 100 girls (955 and 824), and 143 among the children of household heads, so that the routine registration of births, too, recorded newborn daughters less completely than sons. Ottoman population records had registered male newborns since the 1830s, whereas recording the births and deaths of female infants became a bureaucratic routine only from the 1870s (E. Niziplioğlu, personal communication, October 2026). In Palestine, then, the excess of boys among young children records the omission of daughters, which the index, as noted in Section 3.3, does not distinguish from their neglect. In Egypt and in the Balkan interior the ratio is normal at ages 0–4 and rises with age, to 136 in Egypt and to 115 and 117 in Serbia and Montenegro at ages 10–14. The rise points either to girls who went unrecorded as they approached marriage or, on the reading Beltrán Tapia and Raftakis (2022) give of a similar rise in Greece, to a disadvantage that continued through childhood.

For Florence in 1427, Herlihy and Klapisch-Zuber (1985) found evidence of both. They documented systematic distortions in the declarations, yet concluded that "it appears incontrovertible that the Tuscan population was marked by a true deficit of females"; the admission registers of the foundling hospital of San Gallo show that 61.2 percent of the children accepted between 1404 and 1413 were girls. Their summary judgment applies to our problem as a whole: "Behind many of these documentary distortions there lurked an attitude slighting the female sex and discounting its importance" (Herlihy and Klapisch-Zuber 1985: 157).

Egypt follows a different path. Its son-preference score derives from the proportion of boys among last-born children aged 10–14; the sex ratio of young children is balanced. On its face, Egyptian son preference thus appears in reproductive behavior, in the decision to stop childbearing once a son had been born, but the reading is fragile. If some daughters aged 10–14 had already left at marriage, boys would be overrepresented among the remaining last-born children for reasons unrelated to fertility; and the age pattern just described shows that girls of precisely that age are missing from the Egyptian samples, so that the indicator may record the omission of adolescent daughters as much as a stopping rule. For Palestine the case for omission is the stronger one for a further reason: Courbage and Todd (2011) argue that "endogamy thus plays a protective role" for women, including against excess female child mortality, and the concentration of the Palestinian excess in the first year of life fits a delay in registering daughters better than their neglect.

The contrast within the Balkans adds a caution of its own. Kaser (1994b: 73) noted, "if the statistics can be trusted," a surplus of men throughout the patrilineal zone, and in the last two decades, with prenatal sex selection, the sex ratio at birth has risen to 111 or 112 in Albania and Montenegro alike, within a western Balkan cluster that includes Kosovo (Kaser 2021: 87). Yet the Montenegrin children of our 1879 sample show no excess of boys, while the Albanian children of 1918 show the largest unexplained excess in historical Europe. A preference for sons that the patrilineal order made common to both left very different traces in the historical record, and the son-preference domain of the index measures what was done to daughters, or how they were counted, and not the preference itself.

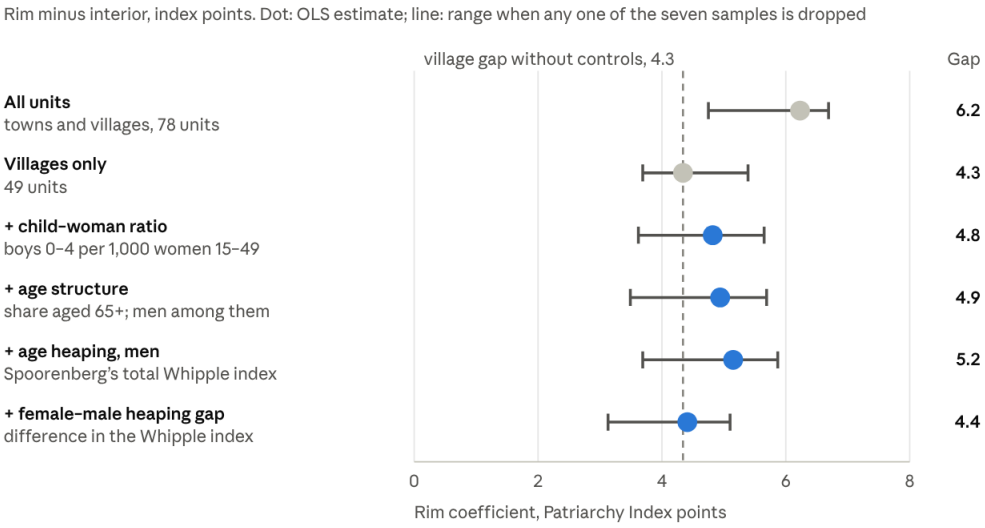
The result does not hinge on a single sample, on the son-preference indicators alone, or on where the line between the two zones is drawn. Without Tuscany, whose catasto combines the under-registration of girls with their excess mortality (Herlihy and Klapisch-Zuber 1985; Barbiera, Castiglioni, and Dalla Zuanna 2017), the village gap remains 4.3 points, of which son preference contributes 2.3. Without the son-preference domain altogether, the gap falls to 2.0 points, carried mostly by male domination. If, finally, the rim is confined to its littoral, with the seven Albanian units farther than 25 kilometers from the sea moved into the interior and the Montenegrin Littoral left out of both zones,

the village gap falls to 2.3 points. It falls because the Albanian hinterland, where the extended family survived longest (Gavazzi 1982: 98) and where tribal society gave Balkan patriarchy its sharpest form (Kaser and Halpern 1997: 66–67), holds some of the most patriarchal populations in our data, Puka among them at 33. The composition of the gap, however, does not change, son preference contributing 55 percent of it and male domination 36. The rim is thus distinguished first by what happened to its daughters as children, and second by how early they became wives.

7 Does the gap survive conditioning?

The third implication of the Mediterranean hypothesis concerns the persistence of regional differences once the conditions that may generate them are held constant. Our data allow a first, demographic, step in this direction; the ecological step is under way and is described at the end of this section. We estimate ordinary least squares regressions of the unrounded PI on an indicator for the rim, using all 78 rim and interior units in seven samples, Egypt included, and then the 49 village units among them (Figure 8).

Figure 8: The rim coefficient under demographic controls



Notes: Coefficients from OLS regressions of the unrounded Patriarchy Index on a rim indicator, for all 78 rim and interior units and for the 49 villages, with demographic controls added cumulatively. Whiskers show the range of the coefficient across seven re-estimations, each omitting one sample.

Across all units, the rim scores 6.2 points higher than the interior. Restricting the comparison to villages reduces the gap to 4.3 points, a fall of 30 percent that reflects the larger share of towns in the interior samples. We then add, one block at a time, the demographic conditions that we can measure for every unit. Fertility itself cannot be measured in these sources, only approached through a child–woman ratio, here the number of boys aged 0–4 per 1,000 women aged 15–49. The ratio is not a fertility

rate. It counts the survivors of five years of births, so that it falls with infant and child mortality as well as with fertility, and it depends on how completely young children were recorded. It is best read as a measure of the weight of young children in the population, the demographic condition that bears most directly on the age-specific indicators of the index. We count boys rather than all children because girls missing from the registers are part of what the son-preference domain measures, and a control that counted them would partly absorb the outcome. Age structure is captured by the share of the population aged 65 and over and by the share of men among the elderly. The quality of age reporting, a proxy for the type and accuracy of the source, is captured by Spoorenberg's (2007) total modified Whipple index for men and by the difference between the indices for women and men.

None of these controls diminishes the gap. With the child–woman ratio, the rim coefficient is 4.8; with age structure, 4.9; with male age heaping, 5.2; and with the female–male heaping gap, 4.4, that is, the full village gap of the uncontrolled comparison. Because the rim indicator varies only between seven samples, conventional standard errors overstate the precision of these estimates. We therefore report, for each model, the range of the rim coefficient across seven re-estimations that each omit one sample. The lowest value in the fully controlled model is 3.1. The results are not sensitive to the choice of child–woman ratio: with the conventional child–woman ratio the fully controlled coefficient is 4.6, and with boys aged 0–5 it is 4.4. In the pooled model of all units with an urban indicator, the rim coefficient moves from 5.6 to 5.1 once all covariates are included.

These estimates should be read as conservative. The child–woman ratio and the female–male heaping gap are in part outcomes of the family system itself, through early marriage and through women's access to numeracy, so that controlling for them risks removing some of the very differences we wish to measure. Age heaping also measures the type of source: it is almost absent in the Palestinian registers, because they record each person's date of birth (Kilinç 2024), and heavy in the Egyptian census samples, where ages were stated at the count. Under the full set of controls the composition of the gap also shifts somewhat. The son-preference component falls from 2.4 to 1.8 points and the male-domination component from 1.2 to 1.0, while the two lineage domains together rise from 0.8 to 1.6 points. Our statement that the rim and the interior share lineage households is therefore a descriptive one; once age structure is held constant, part of the rim's lead reappears in the domains of generational authority and patrilocal residence.

The ecological step is the obvious next one. Theories that derive family patriarchy from the material environment point to terrain and isolation, to the agricultural use of land, to the plow, and to pastoralism (Alesina, Giuliano, and Nunn 2013; Nunn and Puga 2012). Each of these conditions can be measured for our units by overlaying the coordinates of the units, population-weighted where the sources allow, on gridded data

for ruggedness, elevation, land suitability, caloric potential, and historical land use, following procedures already applied to the Mosaic regions (Szołtysek et al. 2025). A first indication of the difficulty ahead is provided by distance to the sea, the obvious geographic correlate of the suggestion, made for antiquity, that the influence of dominant cultures appeared to become more pervasive the closer elites lived to the Mediterranean coast (Nathan 2017: 335). It separates the rim from the interior at the level of samples (the correlation with the rim indicator is -0.61), but within samples it shows no consistent gradient: the pooled within-sample slope is -0.7 points per 100 kilometers with a standard error of 0.9, and the slopes of individual samples differ in sign. Ecological conditions are thus likely to be confounded with the rim at the between-sample level, and their contribution will have to be identified from within-sample variation, which our data provide for Albania, Tuscany, Egypt, and Serbia.

8 Conclusion: codes and structures

We set out to treat the Mediterranean family as a hypothesis. Measured by the same instrument, its populations were more patriarchal than historical Europe and the United States in 1880, and more so than most of Asia in the late twentieth century; where historical Europe came close, in the Russian east, it did so through stronger lineage co-residence, not through early marriage and a deficit of girls. The Mediterranean was nonetheless not one system: most of the variation lies between populations, which range from the high rim of Palestine, Albania, Tuscany, and Egypt through the Balkan interior to the Danubian plain and the western shore, and similar levels are reached through different combinations of domains. The village gap between the rim and the interior, finally, is so far unaffected by controls for the child–woman ratio, age structure, and the quality of age reporting, although its composition shifts somewhat.

These results bear directly on the puzzle with which we began. The rural Florentines of 1427 and the villagers of southern Palestine around 1905 reached almost identical scores, and they did so through largely similar routes. In both, between a third and two fifths of women aged 15–19 were already married, boys outnumbered girls among young children by 126 to 136 per 100, and young wives typically lived with their husbands' kin. Where the two differ, Florence owes more to the age hierarchy between spouses, for only 1 to 4 percent of its rural wives were older than their husbands against 15 percent in rural southern Palestine, and Palestine owes more to the generational domain, above all to the co-residence of the elderly with lateral kin, the mark of the fraternal joint household. In this narrow sense, Herlihy and Klapisch-Zuber's question can be answered: the Tuscan configuration was not merely medieval, since it recurs in nineteenth- and twentieth-century populations on the southern and eastern shores of the sea. But it was not

"the" Mediterranean either, because the Balkan interior, the Danubian plain, Istanbul, Kythira, and the Mediterranean side of Spain, all within or adjacent to the same sea, did not share it. Sacchi and Viazzo (2018: 428) have put the comparative question in the right form: what matters is not whether the Mediterranean was homogeneous but "whether southern Europe looks closer in significant respects to the countries on the other side of the sea than to northwestern Europe." For rural Tuscany in 1427, with the qualifications set out above, the answer is yes; for the Mediterranean side of Spain in the eighteenth and nineteenth centuries, it is no.

The same puzzle also exposes the limits of our evidence. Tillion's republic of cousins was a theory of endogamy, honor, seclusion, and the disinheritance of daughters, and our index observes none of these directly; it observes their residue in who lives with whom, who marries when, and who heads what. Klapisch-Zuber, writing of Florence, warned that "lineage ties and domestic configurations evolved independently of one another, each according to its own logic, the latter much more sensitive, apparently, to the demographic conjuncture" (Klapisch-Zuber 1985: 21, quoted in Kirshner 2015: 9). That residue tells us that the rim differed from its Balkan neighbors less in the shape of the household than in the treatment of daughters, whether they were neglected or merely not counted, and in the age at which they became wives. It also tells us that a high score did not require the cousins. Florence, where the Church forbade cousin marriage without dispensation, belongs to the rim; Albania, whose Muslims Courbage and Todd describe as "resolutely exogamous," belongs to it too. Nor did it require a single code of property. In rural Tuscany devolution was bilateral, with partible inheritance for sons and a dowry at marriage for daughters (Emigh 1997: 620). But the dowry was the daughter's share, and once dowered she was excluded by statute from the paternal estate, which passed to her brothers and, failing them, to her father's male kin (Kirshner 2015: 13, 161–162; on the value of dowries relative to sons' inheritances, which remains disputed, see Botticini and Siow 2003 and Kirshner 2015: 11). Women were not thereby without property. Wives and widows defended their claims to dotal and other assets before notaries and jurists (Kirshner 2015: 14–15), and the women who lived alone, many of them widows, owned vineyards and olive groves, worked some of them themselves, and took part in the market for land and labor about as often as men in the same position (Emigh 2000: 124–125). In the patrilineal Balkans, as Kaser (1994b: 73) described the rule, a woman could neither own nor inherit house and land, and a bride was paid for rather than dowered, although our Serbian census of 1863 lists a minority of women as property owners. Where a family had no son, its property and its line could be saved only by a daughter who swore lifelong virginity and lived as a man, an institution that served, in Kaser's words, "not to free women from their rightless position but above all to repair the fundamentally very fragile patrilineal system" (ibid.: 74; our translation), and no survival of matriarchy (ibid.: 77). The rim thus joins different codes of property and

descent, the dowry and the exclusion of dowered daughters in Tuscany, collective male ownership of house and land and the payment of bride-price in Albania, and, in Tillion's account, disinheritance and cousin marriage on the Muslim shore, which pursued one agnatic aim by different instruments. One patrilineal code, by contrast, is shared by Albanian, Montenegrin, and Serbian populations on both sides of the line between the rim and the interior. Tillion was right about the aim, to keep the patrimony in the male line, and about the frontiers, which are not those of religion; but the mechanism she proposed was one instrument among several.

Our evidence also bears on an older suggestion about the social reach of Middle Eastern patriarchy. Tracing a Damascene patrician lineage over two centuries, Schilcher (1988) proposed that the extended patriarchal family was an early modern and possibly elite phenomenon, while the masses of the nineteenth century "were obliged to live in smaller family units" than they otherwise would have. The villagers of late Ottoman Palestine, at least, were not confined to small units. Rural Palestine and the town of Hebron record some of the highest scores for generational domination in our data, 34 to 39 points out of 40 against an overall mean of 26.7, above all through the co-residence of the elderly with lateral kin. Only the towns of the north and center, at 25, come closer to the pattern Schilcher described. Whether this held among the poor as well as the propertied is what the index computed by stratum will show.

Whether codes such as endogamy, dowry, and the exclusion of daughters from inheritance operated independently of the family organization our index records, from headship and the timing of marriage to the age gap between spouses, co-residence across generations and with the husband's kin, and the sex composition of children, is a question these data cannot settle, but two bodies of evidence at the heart of our project can. One is the corpus of the LOOP project, "Late Ottoman Palestinians: Social and Cultural Dynamics in an Eastern Mediterranean Society during the Age of Empire, 1880–1920" (LOOP n.d.), which reconstructs the Ottoman population registers of Palestine together with the marriage registers kept by the same population offices. The marriage registers give, for each union, the ages of the spouses, the bride's status as a virgin (bikr) or a previously married woman (thayyib), whether her father was alive, the origin of each spouse, and the dower (mahr), and they have begun to yield the kind of evidence the codes require. In the Gaza subdistrict between 1908 and 1913 the mahr fell into four levels that read as a scale of social stratification, brides without fathers received significantly lower payments, and neighboring villages differed in their propensity for local or "foreign" marriages in ways that tracked wealth (Büssow 2026; Niziplioğlu et al. 2025a). In a larger set of 3,265 marriages the median bride was about 16 and the median husband some six years older (Büssow 2026), and spousal age gaps in the registers have been analyzed as a measure of patriarchy in their own right (Niziplioğlu et al. 2025b). Linked to the household registers, and to the names of fathers, mothers, and lineages (ḥamūla)

recorded for each person, these records will allow the incidence of kin marriage, and the dower paid for it, to be measured directly. The other is the Florentine evidence on dowries and marriage ages, above all the records of the Dowry Fund (Monte delle doti), founded in 1425, two years before the catasto, which Molho (1994) used to study the marriage strategies of the city's propertied families (Kirshner 2015: 94, 115). The same sources open two further lines of inquiry. One is social stratification: the catasto records the taxable wealth of every household, the Egyptian registers whether a dwelling was owned or held in waqf, and the Ottoman registers each person's occupation. The index can therefore be computed by stratum within each source, to show how far the regional contrasts we describe hold among the propertied and the poor alike or are carried by particular social groups. The other, the ecological line outlined above, will show whether the regional differences we describe are rooted in the material environment of the rim or persist independently of it.

The broader implication is that the Mediterranean is better treated as a set of variants than as a model. This holds however the region is drawn: under each of the seven definitions we tested, from Tillion's countries taken whole to the littoral alone, it remains high and varied. Its populations shared a high level of family-based inequality, but they arrived at it through a limited number of recurring combinations of domains, some of which reappear across the boundaries of religion, empire, and period.

Our results also bear on two debates beyond the sea. In accounts that place the origins of the western European family in the Church's campaign against cousin marriage (Goody 1983; Schulz et al. 2019; Henrich 2020), the dissolution of intensive kinship and the retreat of family patriarchy tend to appear as one process. Florence in 1427 suggests that they need not have been: a population in which cousin marriage was forbidden without dispensation still married its daughters early, kept its married sons under their fathers' roofs and power, and scored as high as Ottoman Palestine. The second debate concerns persistence. Across Europe, historical family patriarchy predicts present-day gender inequality (Szołtysek and Poniat 2025), but the Tuscan case shows how quickly it could recede, both within the fifteenth century (Section 6) and by the present day (Section 5). Arguments from deep roots are better served by dated measurements than by codes attached to modern countries. Whether the same few combinations recur beyond the sea, in the European east, in Asia, and in the Americas, where the index has already been computed, so that family patriarchy draws on a limited repertoire, a grammar, rather than on endlessly local arrangements, is a question for future work.

Technical notes

Technical note 1. The Patriarchy Index for the Egyptian census samples

The Egyptian samples of 1848 and 1868 contain neither a marital-status variable nor a group-quarters variable, and the standard code had to be adapted in three respects. First, marital status was reconstructed from the household roster. Couples were identified from relationship codes of opposite sex (head and spouse, son and daughter-in-law, father and mother, and so on). Where a household contained several such pairs, for instance three sons and three daughters-in-law, they were matched by rank of age, eldest with eldest, provided that all their ages were known; a head with several spouses was treated as polygynous, all spouses being coded as married with spouse present; persons with children but no identifiable spouse were coded as widowed or divorced; and persons whose relationship to the head implies a past or present marriage but whose spouse could not be found, such as a daughter-in-law without a husband in the household, were coded as ever married, status unspecified. The procedure was validated on data in which marital status is recorded, both by checking the classification of individual cases and by comparing the resulting index values, with very close agreement. Second, the code was adapted to the reconstructed variable. The filters for neolocality and patrilocality, which in the standard code list all ever-married statuses one by one, now also admit the category "ever married, unspecified"; they select the same persons as a filter for ever-married status would, so the definitions of the indicators are unchanged. The proportion of wives older than their husbands is computed on the couples identified in the reconstruction. Third, slaves were treated according to their status. In the Egyptian samples the relationship codes 1225 and 1226 denote slaves and the children of slaves, whereas in Mosaic and NAPP the same codes denote other relationships. Enslaved women were not counted among women aged 20–34 living as non-kin, an indicator meant to capture a degree of female autonomy that slavery precludes, although they remain in its denominator; enslaved women and the children of slaves were excluded from both the numerator and the denominator of patrilocality. Only a handful of persons are affected. Finally, a few inconsistencies in the data were resolved by rule. In five households without a head, the first-listed person was made the head (households 10153000 and 16737000 in 1848; 16715000, 16727000, and 18457000 in 1868). Head–spouse pairs of the same sex, about 140 persons, were treated as recording errors, and the sex of the spouse (in male pairs) or of the head (in female pairs) was recoded; excluding these cases does not change the results. Some 270 persons whose two relationship variables disagreed, recording a sibling in one and a grandparent in the other, were coded as relatives of unspecified type; and the few persons coded "harim," a category the documentation does not define, were

coded as of unknown relationship.

Technical note 2. The bound on omitted women in Florence

The bound asks how far the Tuscan male-domination score could fall if the deficit of women in the city of Florence were entirely an artifact of omission. In the city the catasto records 1,545 men and 1,242 women aged 15–19 (124 to 100) and 4,273 men and 3,101 women aged 20–34 (138 to 100). We add the missing women, 303 and 1,172, as never-married women living as non-kin of their household head, the status in which Herlihy and Klapisch-Zuber expected rural girls in urban service to be missed. Two of the four male-domination indicators change. The proportion of women aged 15–19 ever married falls from 0.449 to 0.361 ($0.449 \times 1{,}242 / 1{,}545$), and the proportion of women aged 20–34 living as non-kin rises from 0.021 to 0.289 ($(0.021 \times 3{,}101 + 1{,}172) / 4{,}273$); female headship and the share of wives older than their husbands are unaffected. The index scores these two indicators in equal steps of the proportion, about 0.072 for ever-married teenagers and 0.073 for non-kin women (steps inferred from the 428 regional populations of our file and the European file, every one of which they score as the files do). The first change therefore costs one point (6 to 5) and the second four (10 to 6), so that the domain score, the sum of the four indicator scores, falls from 32 to 27, and the index, to which the domain contributes a quarter of its score, by 1.25 points. The computation ignores the age weights within each age group and assumes that none of the omitted women had married, and both simplifications enlarge the bound. Applied to each of the nine Tuscan villages, a correction of 1.25 points lowers their mean index from 25.9 to 24.7 and their lead over the sixteen interior villages from 4.5 to 3.3 points; because these villages are nine of the thirty-three in the rim, the pooled village gap falls by $1.25 \times 9/33$, or 0.34 points, from 4.3 to 4.0.

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