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Macro-level changes and micro-level processes: family change in Rostock, 1819-1867

Abstract

This study is informed by competing perspectives on family bahavior in periods of turbulent social change and intends to provide some fresh insights into the effect of macro-level changes on micro-level processes involving the family. In this pilot study we take our first step towards analyzing the impact of developing urban-industrial life on the family system in the northern German city of Rostock. A variety of quantitative approaches is employed to capture longterm changes in household structure and composition, household formation rules and patterns of leaving home in this historic Hanseatic community in two census years, 1819 and 1867. Overall we can observe rather stable patterns for both censuses, 1819 and 1867, with only small shifts from more "traditional" towards more "modern" patterns of the family. Interestingly, the persistence of the family pattern in Rostock rested primarily on the continuity of nuclear family-centred patterns of coresidence. Neither we detected a destruction of the traditional pattern of extended family household, nor we proved the progressive nuclearization of the family in Rostock between 1819 and 1867.

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I. Introduction

The classic theoretical wisdom, from F. Le Play up to the early 1970s, held that industrialization resulted in desintegration of the family group into smaller units of nuclear families. The supposed 'structural fit' between the nuclear family and industrial society was particularly firmly established in the works of structural-functionalist school. The nuclear family was thought to be best adapted to the demands posed by high rates of social and geographical mobility of individuals typical for the industrial system. In order to have this adaptation completed, the family group must take structurally isolated position in relation to more extended kin and neighbours, and kinship obligations towards the nucleus must take precedence over obligations to kin outside it. Accordingly, it was presumed that nuclear families will do better than extended ones in achieving social and economic goals characterized for indudstrial society, and individuals living in nuclear family units will be better equipped to reach the higher placed positions in life (Parsons & Bales 1955; Goode 1966; Gore 1968; Sennett 1970; Smelser & Halpern 1978). The nuclearization thesis has been most simply summarized by Goode who argued that "Wherever the economic system expands through industrialization, family patterns change. Extended kinship ties weaken, lineage patterns dissolve, and a trend toward some form of the conjugal system generally begins to appear" (Goode 1963, 6; see also Lee 1982, 114-119; for a general overview: Popenoe 1988)[1].

Later research first undermined the hypothesis of the progressive nuclearization of the family by suggesting continuity in nuclear family structure over many centuries, at least in Northwest Europe (Laslett & Wall 1972). Some scholars went so far as to argue that particular developments in the West were owed to distinctive family and demographic arrangements, and that the nuclear family along with the Western European marriage pattern were among the necessary preconditions for modernization and industrialization (Macfarlane 1978, 1987; Wrigley 1977; Laslett 1983; Hartmann 2004).

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[1] The nuclearization (or nucleation) thesis has also a parallel, but wider meaning within contemporary demographic discourse concerned with development of family patterns in the non-European societies. It holds that a shift towards conjugal marriage and nuclear household residence patterns is an inevitable consequence of globalisation, specifically the penetration of Western-like socioeconomic developments, as well as Western ideology through formal education, Christianity and the mass media. Accordingly, evidence of increased conjugality as caused by those processes will also be reflected in the reduced symbolic importance of the lineage and ancestors, greater marriage stability, the demise of polygyny and widow remarriage, increasing age of first marriage for women, and decreasing age differentials between spouses (Neil and Neil, 1999).
Empirical research on industrialization in contemporary developing nations provided at least partial support for Goode's theory of convergence (Goode 1963), where it has been shown that economic development is associated with a decline in family complexity. For example, two decades of rapid industrial and urban growth in Taiwan were accompanied by a well-documented decline in the proportion of extended households (Freedman, Chang & Sun 1982). Similar examples regarding other Asian societies include: Wong 1975, Martin 1990; De Vos & Lee 1993. Other recent studies, however, show the highly variable response of household and family characteristics to the processes of rapid socio-structural change (see McDonald 1992, 20-23; Ruggles 2009, 250-251).

Others yet, countervailing further structural-functionalist assumptions, argued that the harsh economic conditions of early industrial capitalism strengthened the interdependence of family members and led to a high frequency of complex households (Anderson 1971; Hareven 1978, 1982; Katz 1975). Laslett became himself involved in recasting of this big historical debate, and suggested that exact reverse proposition about industrialization and the structure of the household is becoming increasingly possible to prove. He pointed out that where some English communities were compared before and after industrialization took place, 'it can be shown that households became more, not less, extended' (Laslett 1973, 23; Laslett, Wachter & Laslett 1978, 75-77). Wrigley speculated along similar lines and argued that, indeed, the impact of industrialization on the family may have been 'anti-modern'. During the early industrialization, the argument followed, people might find 'a web of informal relations with kin and neighbours the only resort against disaster', what may consequently 'produce changes in family structure and bahavior which appear regressive when compared with later changes' (Wrigley 1977, 82).

M. Anderson's study of family structure in nineteenth-century Preston, Lancashire (Anderson 1971) seemed to provide a prime empirical justification for promoting the view according to which hardships of industrial city life might have actually stimulated the formation of extended households. Especially among young couples and the elderly, kin relations and kin support from within the household appeared to be highly functional in helping individuals to adapt individuals to the impact of the process of social change. Still, however, even in Preston, 73% of families were nuclear, and no more than 23% of households contained related persons other than members of the current nuclesar family of the head (Anderson, 1971, 44).

T.K. Hareven's study on migrant families in the textile community of Manchester, USA, at the beginning of the 20th century, pointed in the similar direction (Hareven, 1982). Despite the development of industrial relations in the community, large and extensive family networks have existed among the migrants to the city. According to Hareven, that must have been explained by the fact that kin assistance was crucial in handling family crises and in coping with the insecurities imposed by the industrial system. Traditional functions of kin in rural society did not diminish, but were modified to fit the needs and requirements of urban, industrial life.

H.Medick (1981), looked at the problem from the perspective of developing subclasses of rural industrial producers. Referring to Mendels' classic protoindustrial thesis (Mendels 1972), Medick argued that in some parts of Europe the protocapitalist period in the rural settings has witnessed a growing number of protoindustrial producers whose links with the market economy made them an increasingly distinct socially and demographically from more traditional peasant classes. Working under the conditions of the limited familial production capacity and high

consumption pressures, such families have often found the formation of extended households a viable mean to counterbalance the poverty generated by the family life cycle. Such an extended family would function 'as a private means to redistribute the poverty of the nuclear family by way of the family-and-kinship system', and would contain widowed or unmarried sisters or brothers, nieces and nephews 'fairly frequently' (Medick 1981, 58-59; for similar arguments, see Scott & Tilly, 1975).

D.Kertzer added yet another aspect to the discussion of the nuclearization thesis. He found virtually no change in the coresidential pattern of the community of Bretalia in central Italy between 1880 and 1910, during which time that community began to be increasingly incorporated into the urban structure of neighboring Bologna and was undergoing critical transformation of its socio-economic and occupational structures. Interestingly, both before the urban expansion and in the midst of the modernization-processes, some 42% of the people out there were living in complex family households. Despite nearly doubling the household and population numbers, the proportion of simple, as well as extended and multiple families remained unchanged over the period of three decades. Such an 'uncanny similarity in coresidential situation' taking place notwithstanding of the process of socioeconomic change, undermined the nuclearization thesis, however, leaving many other problems not resolved at the same time (Kertzer 1984, 91-97)[2].

A.Janssens, who studied the Dutch industrial town of Tilburg between 1850-1920, also revealed a striking continuity in the overall pattern of living arrangements despite the gradual but profound proccess of social change surrounding the town's families. Both before and during the period of rapid demographic and industrial developments in the town, a large majority of families in Tilburg followed a traditional pattern of coresidence and developed a household structure beyond the nuclear core at some point over their cycle. Embarking upon her empirical findings, Janssens suggested a model of social change in which family change is not directly and immediately linked to structural social change. According to Janssens, Tilburg experience constitutes an example of the 'cultural lag' that can exist between family systems and sociostructural developments (Janssens 1986, 1993).

[2] According to Kertzer, so little change in coresidential characteristics as revealed in the persistent attachement to living in complex domestic units over the entire period of socioeconomic transformation should be attributed to continual cultural elements perpetuating postmarital (joint) residence, together with strong normative pressure on the younger generation to provide for their ageing parents. These customs, although they evolved in response to entirely different set of economic conditions, continued afterwards under altered circumstances, because people found a way 'to adapt patrilateral postesidence system to the problems (…) [they] faced in the new economic and social conditions' (Kertzer 1984, 105-106). Rapid population increase not accompanied with a concomitant increase in housing has also played a role.

By means of those studies, Kertzer and Janssens warned us that the effects of industrialization on households and families may differ from community to community (Kertzer and Schaffino 1983; Janssens 1993). This way of reasoning was also followed by T.A. Arcury (Arcury 1990). He specified the factors affecting household and family characteristics during industrialization and argued that the nature of the pre-existing family system, the characteristics of the industry and its technology, demographic processes in the community, the relative poverty of the workers and availability of housing, along with socio-cultural characteristics of the population, may all affect the nature and direction of change in family system in a variety of ways (Arcury 1990, 286-287).

Other perspectives exist, however, adding to the theoretical confusion. S. Ruggles (Ruggles 1987), for instance, challenged that interpretion that the extension of the household structure served as a functional adaptation to the mode of industrial life by arguing that extended family living arrangements in the nineteenth century were something of the luxury. They were far more common about bourgeoisie than among the industrial working class. According to him, the demographic change alone could account for visisble signs of the rise of the extended family in the nineteenth century. He advanced an argument according to which increasing life expatancy and declining marriage between 1700 and 1900 greatly expanded the opportunities to reside in extended families.

Such a proliferation of opinions proves a scientific debate over the links between 'modernization' processes and the family structure has yet not come to an end. That the topic itself needs further elaboration is also suggested by the negligible number of research on that issue for the German speaking territories. Admittedly, H. Rosenbaum offered a very generalized overview of familial developments in nineteenth-century Germany, which, however, can hardly be translated into more structurally defined notion of the progress (Rosenbaum 1996: 183-187, 476)[3]. What kind of trend in household changes can be expected within this cultural area can only be hypothesised on the basis of a very scanty research. W.H. Hubbard's 'GRAZHAUS-Projekt' from the 1970s, for example, used Austrian published census data from 1857, 1880 and 1900 to ask a related set of questions in relation to family developments in the city of Graz (Hubbard

[3] According to Rosenbaum, during the 19th century the bourgeois and proletarian families were introduced as new kinds of familial patterns. The proletarian families became important because of their number, while the bourgeois families were much fewer, but have had their ideals spread to other groups of the population. After 1830, the artisan families, particularly the richer ones, also took over bourgeois family ideals and separated themselves from their employees, what led to increasing quotas of the journeymen living alone with their own families. The households of journeymen and partly also those of poorer independent artisans were increasingly similar to that of workers, while the households of richer artisans became increasingly more bourgeois in style. However, there are almost no statistics in Rosenbaum's book and especially not about household structures. For example, worker's families were mostly simple family households, but partly also extended family households (Rosenbaum 1996, 431).

1976)[4]. Hubbard observed an increase of extended family households at the expense of simple family households in the second half of the 19th century. In 1857 households without non-kin were two thirds simple family households, 22 % extended family households and about 15 % solitaries. In 1900 simple family households were only one half, while extended family households make up about 40 % and the remaining 10 % were solitaries. Hubbard's research, however, suffers from some typological inconsistencies which prevent it from making fully fruitful comparison with other datasets.

Crude data on means size of private households available for some German towns may suggest something of a reverse pattern. Between 1849 and 1867, MHS declined from 6.49 to 4.42 persons per household in Berlin, and from 7.46 to 5.02 in Frankfurt am Main between 1840 and 1871, what may have been indicative of a simplification of family structure. On the other hand, the data from Dresden and Leipzig shows no change in MHS over 1849-1871 period (Rothenbacher 1997, 271-271).

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This research attempts at re-introducing the problem of relationship between set of processes often subsumed under the label of 'modernization' and the family change to the historical-demographic literature by means of examining the impact of developing urban-industrial life on the nature of family system in the industrializing city of Rostock. We employ a variety of quantitative methodologies to capture longterm changes in household structure and composition, household formation rules, patterns of marriage and celibacy as well as those of leaving home in the two censuses. The research is also motivated by the intention to provide some fresh insights into the effect of macro-level changes on micro-level processes involving the family. It is hoped that this newly available material might provide new empirical insights sufficient to contribute to further theory building regarding the interplay between processes of social change and family change in the past. This pilot study has a potential to set up new promising research directions also due to expected extension of the existing database so as to include two additional censuses from Rostock of equally high quality: the censuses of 1890 and 1900[5]. This new corpus of data may prove to be particularly meaningful. It will allow to place coresidential patterns in Rostock in the much longer perspective that would cover the period of supposedly more critical alterations in the city's socioeconomic and institutional framework.

[4] See also Hubbard 1984. Mitterauer 1976 concerned the effects of protoindustrial developments on the family composition, albeit in the rural setting only.

[5] Mecklenburg-Schwerin (Großherzogtum), Volkszählungsamt. *Volkszählung am 1. Dezember 1890*. Landeshauptarchiv Schwerin. 5.12-3/20 Statistisches Landesamt (1851-1945); *Volkszählung am 1. Dezember 1900*. Landeshauptarchiv Schwerin. 5.12-3/20 Statistisches Landesamt (1851-1945).

Those processes would then be analyzed in the context of broader demographic change, especially the onset and speed of the first demographic transition.

II. Socioeconomic development and demographic characteristics

A) There are significant reasons why the city of Rostock can serve a particularly good laboratory for re-evaluating existing models and theories regarding the relationship between developing urban-industrial life and the change in family system.

First of all, there exists the rich statistical, micro-census data gathered for this urban community of northern Germany between 1819 and 1867. These two dates mark two censuses carried out in Mecklenburg, and they offer valuable early data. The 1819 Census of Mecklenburg is one of the oldest surviving individual level data population censuses in Germany. For the first time ever, the total population of Mecklenburg-Schwerin was quantitatively and qualitatively recorded[6]. The wealth of information collected in the census of 1819 (sex, first name, last name, day of birth, place of birth, parish of birth, relationship to household head or occupation, property ownership, duration of residence, marital status, religion) has rightly earned it the reputation of being a leading German population census at that time (Tscharnke 1943: 29). It was followed by the 1867 Census which used modern refined population-counting methods, just implemented in Germany in the 1860s[7]. Both censuses provide a wealth of information (an individual's name and surname, sex, year of birth, place of birth, social status, relationship to the household head, occupational and marital status, and religion) and, making certain allowances for specificity of the 1819 data, can be utilized to carry on structural analysis of the family system (see, however, certain reservations discussed below).

Socioeconomic structural development of the town during the 19th century also presents an interesting context for setting up the investigation into changes in its inhabitatnts' family and coresidential behavior. Rostock was the biggest city of the Grand Duchy of Mecklenburg, with ca 5 percent of its entire population. Once a vital port-town of the Hansa, sharing a common

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[6] The census was ordered by the Grand Duke of Mecklenburg-Schwerin. The purpose of the census was to determine the exact military contingent of each Confederation territory. The lists were to constitute a "comprehensive register of every person living on the day of the census, as young or as old as they may be, of every gender, trade, or religion". Census enumerators were instructed to visit every household in order to list every person living in that household. The lists were due to be submitted by August 25th. However, taking the census took more time than assumed and the closing date was delayed to mid-November and then again to early December. The last survey questionnaires were handed as late as in February 1820.

[7] The 1867 census of the Grand Duchy of Mecklenburg-Schwerin was taken on the night of December 2-3, 1867. That night authorized enumerators visited every house in the district assigned to them, listing every person staying there at that moment in time. The head of each household was responsible for the correct completion of the census form. The census was taken along the rules used by the North German Confederation and the German Customs Union, which the Duchy of Mecklenburg-Schwerin became part of in 1867/68. The census was supposed to gain an overview of the taxable and conscriptable population.

maritime past with Hamburg, Bremen and Lübeck, it just had experienced a centuries-long economic decline. At the beginning of the 19th century it was surrounded by agricultural land heavily characterized by manorialism and estate property patterns, but the city- and private rights set the town distinctly apart from the rural hinterland. While serfdom was abolished in Mecklenburg in 1819, right of abode was only granted in 1868 and freedom of trade was declared in 1869 (Kuna & Deya 2007). At that time, however, even the city itself still exhibited certain features of the pre-modern social and institutional order. It held on to its pre-modern municipal laws until 1871, which were replaced by the first unified German civil law code in 1900 bringing to an end the two-class system of 'citizens' and 'inhabitants' in the town (Reichsgesetzblatt 1874/ Nr 1019; Bundesgesetzblatt 1896; Reichsgesetzblatt 1896/ Nr 195). The dissolution of the guild-system in Rostock was only initiated in 1871 to become finally accomplished in 1890 (Schröder 2003, 140). Rostock social and occupational structure at the end of the second decade of the nineteenth-century was classified as 'pre-modern', as reflected in the high percentage of domestic servants, and the city represented a prime example of a trading-, commerce-, and service-center (Manke 2000, 210-212). The city's economy derived its identity from its longstanding maritime trading, with the grain as the foremost trading good. Rostock's commitment to grain export was moved along by the agricultural structures of Mecklenburg's hinterland and by the interests of manorial landowners, who ran large farms oriented towards grain production.

Still, however, the time between the censuses was marked by important structural developments which affected the overall living standards of the city's population in a considerable way. From the mid-1840s compulsory school education was introduced and the number of public schools increased from 1 in 1820s to 7 in 1860[8]. The first railways had come to Mecklenburg in 1848 and Rostock got connected two years later. In 1873 the Friedrich-Franz Railway Company of Mecklenburg took up regular schedule with the city (Mecklenburgischer Staatskalender 1880, 250-253). The installation of steam-engines marks another aspects of the general developmental trend. The Gieseler Register of known steam-engines[9] documents 4 steam-engines in Rostock for the time period before 1850: the first being the steam engine of the oil mill company Karnatz in 1823, followed by a machine in an iron-casting factory in 1838, another in an oil mill in 1846, and one in a brewery in 1848[10]. Finally, the first bank for private

[8] Among them: 1 Civil School of higher Education -"Höhere Bürgerschule"; one "Industry School", as well as 4 for poor children). Source: Mecklenburgischer Staatskalender 1830, p. 143; 1840, p.196-197; 1850, p. 207; 1860, p. 185 and 213.

[9] Gieseler, A. (2009). http://www.albert-gieseler.de/dampf_de/texte/impressum.shtml ; http://www.albert-gieseler.de/dampf_de/tables/gsn1310.shtml ;

[10] The next wave of steam engines seemed to have arrived in Rostock only during the 1880s with a peak in the early 20th century.

savings of Rostock had been established in 1825, and a second general bank of Rostock in 1850 (Karge & Münch 2004, 270-273).

Despite turbulent socioeconomic changes revealed so far, Rostock was by no means a fully successful pioneer of industrial development. While during the first part of the 19th century the city witnessed innovative developments, they were by and large hampered by prohibitive legislation of the time. The interests of manorial landowners from the hinterland had the effect of delaying incentives for industrial production and export in Rostock other than that of grain (Manke 2000), a deficit which became more and more apparent in the second half of the 19th century. Economic crisis of the 1820s caused by overproduction of grain in Mecklenburg, heavily affected Rostock's shipping trade as well (Manke 2000, 199). The city regained its foothold in the second half of the 19th century and again entered a period of vigorous economic growth and modernization. The Crimean War (1853-1856) between England, Russia and the Ottoman Empire allowed Rostock to recover by profiteering from it. Grain-shipments and transports of weapons into the war zone kept Rostock's merchant fleet busy and allowed for transport profits of up to 240% (Schröder 2003, 135). What looked like prospects for the future long-term development, however, soon turned into somewhat stalling structural innovation (with a distinct slump between 1850-1880) accompanied by legislative liberalization.

Although the first iron steamship with propeller propulsion ever built came from a Rostock shipyard in 1851, this innovation was not continued. Instead, Rostock shipyards prolonged the construction of wooden sail ships. Only forty years later, when the merger of local ship sites created the great ship yard "Neptun" (almost exactly on the spot where the present MPI building is located), the construction of steel ships was initiated and reached industrial dimensions (North 2008, 76). Contrary to cities like Hamburg, Bremen and Stettin which had developed modern harbors with excellent transport connection, Rostock's docks were becoming increasingly antiquated, its harbor entrance too shallow with no investments to dig deeper shipping lanes. It became significantly more profitable, even for Mecklenburg crop farmers, to lodge goods directly by train to Hamburg (for shipping westward) or to Stettin (for shipping eastward) than to load ship in Rostock. (Karge & Münch 2004, 135).[11] The Prussian Railway line from Hamburg to Stettin traversing Mecklenburg, set up in 1870, added to the city's misfortune (Karge & Münch 2004, 135). Even though the next wave of steam engines arrived in Rostock during the 1880s, the city could hardly compete with other centers like Bremen[12]. Last, but not

[11] In 1873 the Baltic harbor of Stettin already handled 1,020,000 tons of goods and Rostock 56,000.

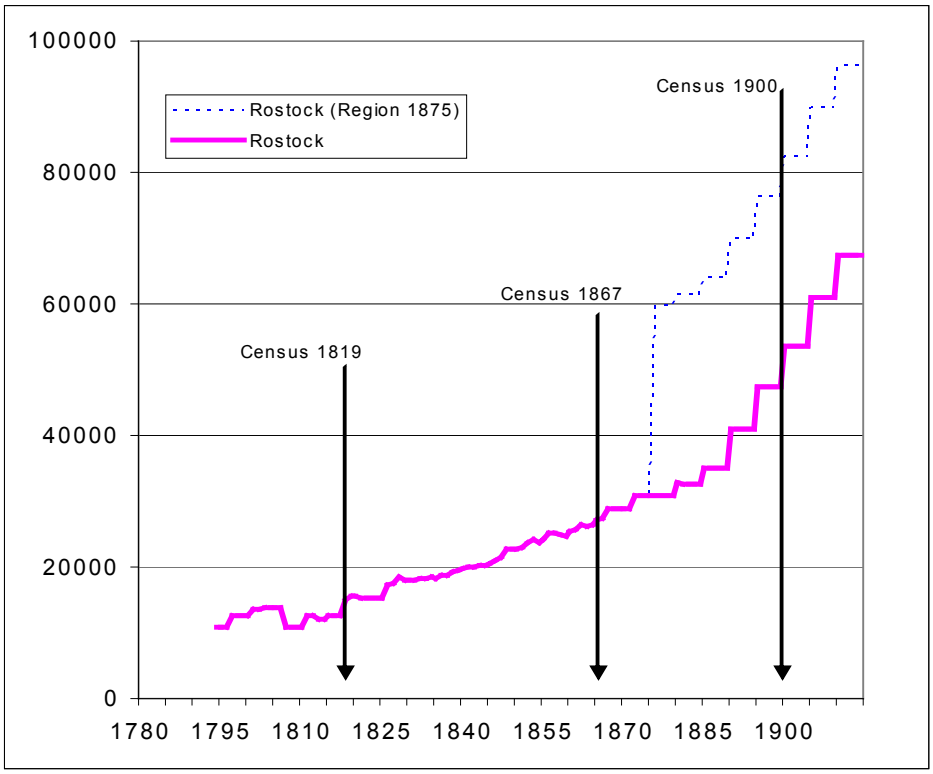
[12] By 1910, Rostock counted for 36 documented steam engines, most of them used by the shipping industry. 6 additional engines could be found in near-by villages. A comparison: Bremen at the same time has documentation for 85 machines, but seemed to have entered the steam-machine era much later than Rostock, starting only in the 1860s.

least, Rostock faced serious difficulties in establishing itself as a developing financial market for the region. Despite of being the largest city of the province, it only came in third in accumulating savings- and investment capital during the 19th century, ranking behind Schwerin and Wismar (Mecklenburgischer Staatskalender 1880, 274).[13]

B) Demographic structures and developments

The population in Rostock showed an almost steady increase in population from 12,585 persons in 1800 to 82,401 persons in 1900. Part of this increase was due to a change in administrative borders in 1877, which meant incorporating previously agrarian regions, which had been urbanized during the previous decades (**figure A** in the text)[14].

Figure A: Population growth in Rostock, 1795-1900



The yearly number of births was always exceeding that of deaths during the 19th century with the exception of 3 epidemics of cholera in 1832, 1850, and 1858. Crude birth rates were around 30

[13] It might be argued that this retarded socioeconomic development disqualifies Rostock as a suitable case to examine the raltionship between industrialization and the family systems. However, it has been argued that a classical industrial development characterized by dramatic and all-pervading change associated with large-scale industrialization should be considered as exceptional in historical reality. What the great bulk of the population in the nineteenth-century experienced was a social and economic change of a much more gradual and limited nature (Janssens 1993, 244-245)

[14] All figures related to our setting and data description, as well as to the research design are pasted in the text, whereas those referring to the exact data analysis were moved to the Appendix at the end of the paper.

and crude death rates between 25 and 20. These rates provided for a steady natural population increase, which was accompanied by a positive migration balance. Up to about the census year of 1867 immigration was more important for population growth than natural increase, while afterwards natural increase became the leading force.

Figure B: Population age structure – Rostock in 1819 and 1867

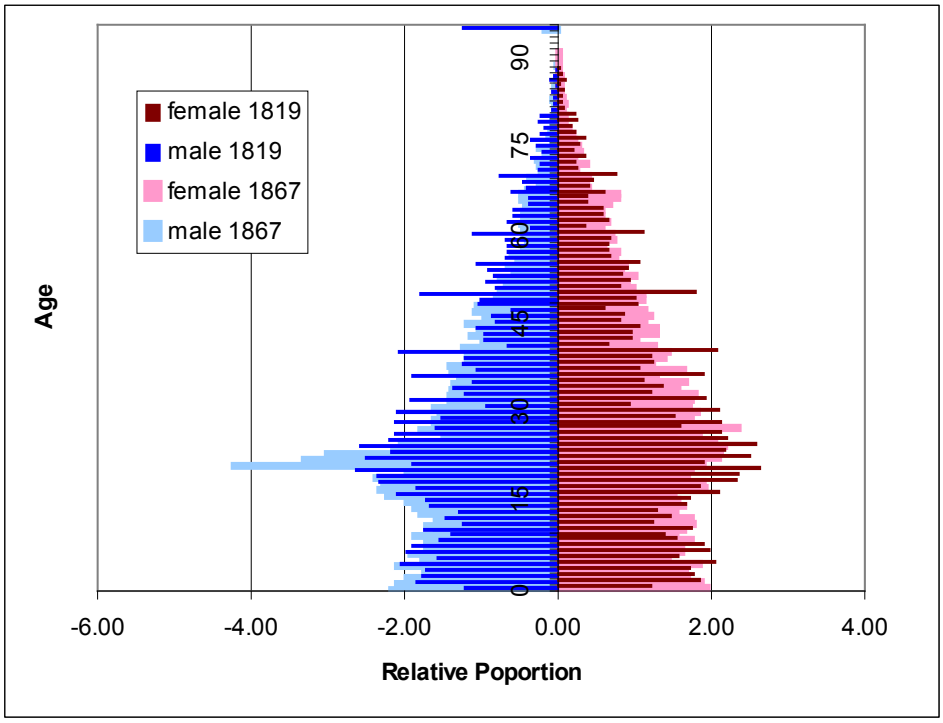
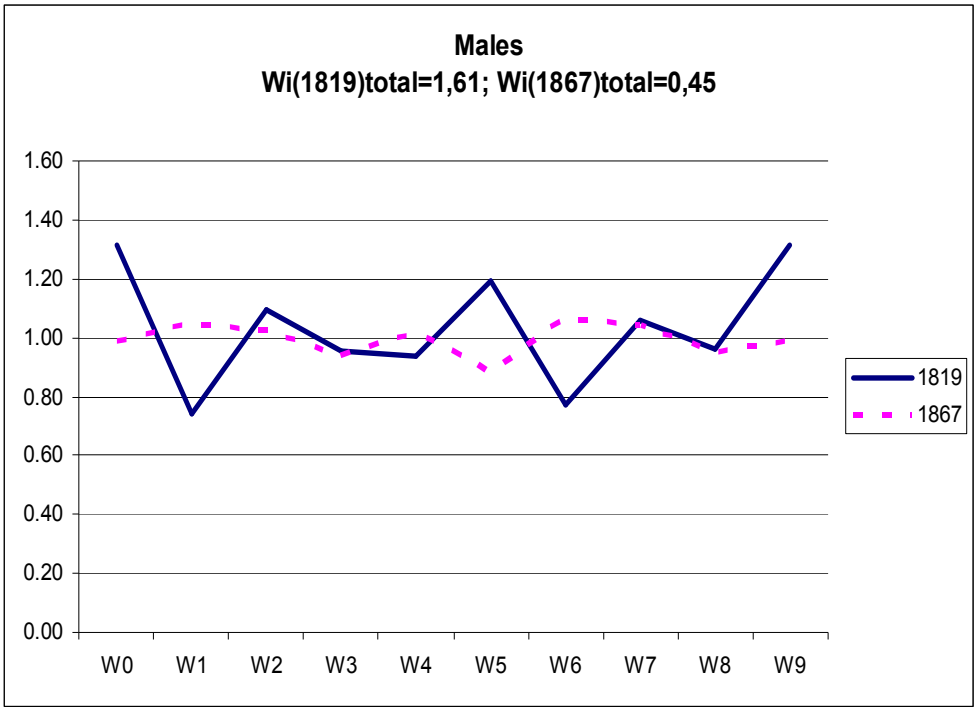
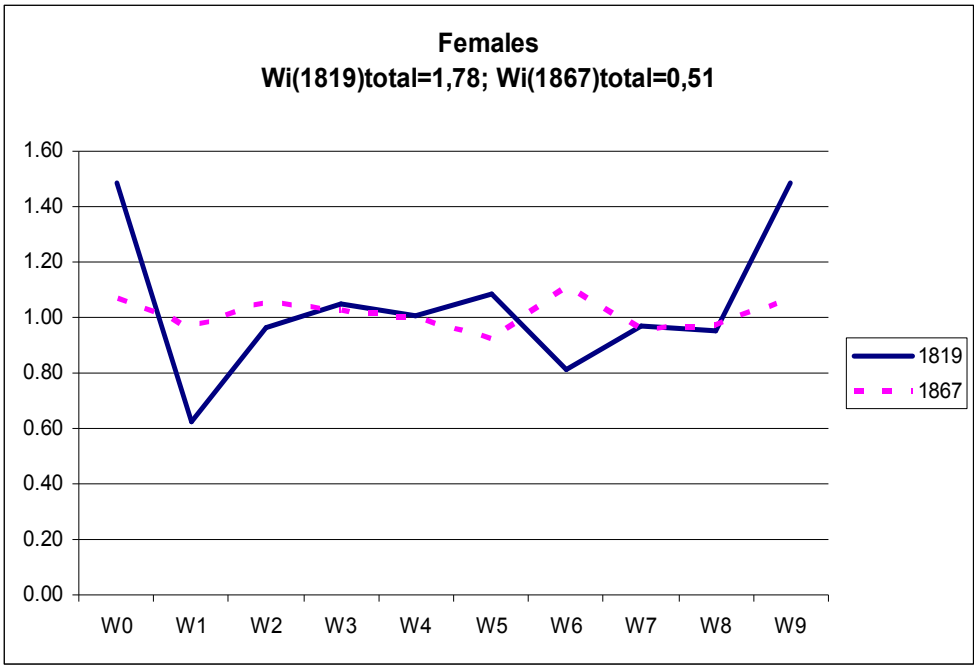


Figure C: Digit-specific modified Whipple's indices (W_i) and total modified Whipple's indices (W_{tot}), males of Rostock 1819 and 1867



Source: Census data Mecklenburg-Schwerin for the city of Rostock

Figure D: Digit-specific modified Whipple's indices (W_i) and total modified Whipple's indices (W_{tot}), females of Rostock 1819 and 1867



Source: Census data Mecklenburg-Schwerin for the city of Rostock

The age structure shows actually a pyramid with the effect of immigration of young adults causing a bulge around age 20 (**figure B**). The extreme peak for men at this age is caused by the presence of many soldiers in the city in 1867. We can also clearly see the effect of age heaping in the census of 1819, especially for women. The calculation of total modified Whipple's indices (Wtot) yields 1.61 for men and 1.78 for women in 1819 and only 0.45 for men and 0.51 for women in 1867 (**figure C and D**) (on Whipple's indices, see Spoorenberg 2007).

The census of 1867 in combination with the burials in the new cemetery for the period of 1865 to 1869 allows to calculate life tables for men and women (**table A** in the text). The results are quite similar to the ones for the whole of Germany in 1871/80, but much lower than the ones for the whole of Mecklenburg some three decades later, which showed a much higher life expectancy than the whole of Germany due to lower infant and child mortality in the region. The infant mortality rate was between 10 and 25 percent for the years 1827 to 1875 according to the church registers of the parish of St. Jacobi in Rostock (on urban mortality in Germany, see Vögele 1998).

Table A: Life table estimations – nineteenth-century Rostock in comparison

Age	Rostock 1) 1865/67		Germany 2) 1871/80		Mecklenburg 3) 1891/1900		Germany 2) 1891/1900	
	m	f	m	f	m	f	m	f
0	35.58	38.73	35.58	38.45	47.14	49.87	40.56	43.97
20	38.35	43.68	38.45	40.19	43.94	45.37	41.23	43.37
40	24.57	28.45	24.46	26.32	28.10	29.48	25.89	28.14
65	10.25	11.05	9.55	9.96	10.78	11.14	10.12	10.62

1) Calculations R. Scholz.2) http://www.lifetable.de/data/MPIDR/Germany1891-1900.txt3) Statistik des Deutschen Reiches. Neue Folge, Bd 200. Berlin 1910, S.32*-36*

III. Research design

A) The family system and its main contributory factors

We conceptualize the relationship between industrialization and the family relations as the former having an effect on the entirety or on some constitutive parts of the prevailing family system. The latter term requires some clarification. The concept of family system belongs to one of the most frequently used in the studies of historical demographic structures (Laslett, 1983; Todd 1985). Contrary to classic anthropological works (where it usually refer to relatively well specified phenomena from the kinship domain; see Yanagisako 1979), in historical demographic research it has long remained not well-defined and had been used to denote a wide variate of circumstances (see Wall 1991, 623; Berquo & Xenos 1992). Recently, building on theoretical developments in the works of Wall, Hajnal, Laslett, Mitterauer and others, Polla (Polla 2006) sat forth a valuable specification of it. Following this author, when speaking of a family system, we shall be referring to 'an entity that comprises the household and marriage arrangements typical of a certain population at a certain time and all connected phenomena'. In other words, the family system's main contributory factors include the household formation patterns, family forms, nature of the family life course, and marriage behavior. Such defined, a family system is a social institution that changes with time and which development 'depends on the combined effects of numerous external factors' - economic, social and ecological (Polla 2006, 28-29)[15].

[15] Other valuable contributions to conceptualization of the family systems include: Burch 1995; Wall 1995; Oris & Ochiai 2002.

Here, we are taking a step further in relation to those theoretical considerations with an intention to grasp the very manifestations of change and development of family systems as precisely as possible. We suggest that the change in a family system can be effectively detected by observing structural developments in one of the domains listed below, or – in several of them combined:

1) *Marriage behavior*: A change in nuptiality may have a profound effect on other constituents of the family system. For most preindustrial societies of Northwestern Europe marriage was essentially linked with the process of household formation. Patterns of age at marriage and celibacy were also determinative of the joint coresidence of several conjugal units (Laslett 1977; Hajnal 1965, 1982; Seccombe 1990). In England, marriage behavior strongly responded to short-term fluctuations in real wages. Towards the end of the 18th century, women's mean age at first marriage fell drastically in concurrence with unprecedented increase in demand for labor caused by the Industrial Revolution (Wrigley & Schofield 1981; also Schellekens 1997; King 1998).

2) *Household structure*: despite an older and newer criticism (e.g. Berkner 1975; Wilk & Netting 1984; Sabean 1990; Wall 2001b) change and variation in the kin component of the co-resident domestic groups (that is among persons sharing a clarly defined living space or dwelling; Laslett 1972), remains one of the most powerful indicators of alteration and diversity in family systems. In a given community, the change in household structure (i.e. shift in proportion of nuclear households in relation to extended or multiple-family ones) may reflect significant changes in preferable or achievable residential patterns. It may also indicate a change in the way obligations toward kin from outside the immediate family circle are structured (Das Gupta 1997). Households differing by structure may perform their welfare functions on a different basis altogether (Smith 1981; Cain 1991), and cope with economic hardships in a different manner (Laslett 1988). Family systems with different dominant patterns of households structure may also generate dissimilar health and other developmental outcomes (Das Gupta 1999; Skinner 1997)[16].

3) *Household compisition*: HC is partly a derivative of household structure, but it carries more complex set of meanings as well. Household composition is determined by **all people** living together and their relationships to one another. Therefore, the notion of household composition goes beyond the kin component of domestic group so as to assess to participation share and the role of other potential household members such as servants, lodgers and other non-relatives. Understood in that way, household composition provides more specific information on the character of family interaction and reveals in much more detail a certain form of organisation

[16] Examples of profound changes in the kin component of the co-resident domestic groups over time have been reported for such different settings as northern coastal Sweden 1700-1900 (Egerbladh 1989), French Haute Provence 1780-1836 (Collomp 1988), coastal Finland 1635-1895 (Moring 1993), central Belarus (Nosevich 2004), Hungary 1792-1804 (Andorka & Balazs-Covcs 1986), and pre- and post-famine Ireland (Fitzpatrick 1983).

governing the transmission of practices and vlaues within a domectic group (Goode 1964, 44-45; also Laslett 1983, 524-535). Since changes and differences in household composition may not always fully reflected when household structure is scrutinized alone, household composition analysis allows to discern a variety of more specific patterns within domestic groups, such as: the size of offspring and sibling group, type of co-residing relatives, types of relationships between all domestics (Wall 1977; Szołtysek, 2008a).

4) *Household formation patterns*: our approach to this problem refers to two distinct but related phenomena: a) the relationship between marriage and entry into headship (Hajnal, 1982, pp. 463 ff.). Under Northwest European demographic regime, marriage and household formation usually went hand in hand: men became household heads at first marriage, and entry into headship was concentrated into a comparatively narrow age range (Smith, 1981, 600). Any significant alteration in this sphere of behavior points to critical changes in the overall structure of a family system and bears direct consequences for household structure and composition; B) the tendency of adults in a population to head their own households or to share households (Burch et. al. 1987). This can be measured by either by age-specific headship rates among the sexes (percentage of heads among male and female population of given age group), or – more sophistically – by computing a ratio of the actual number of households in a population to a theoretical maximum number of households that would results if each age-sex group in the population were to experience maximum headship rates (*index of overall headship*; Burch 1980). Changes in headship rates over time may be indicative of changes in household formation behavior either within age-sex marital status categories, or in the population in total. For example, a decrease in the value of age-specific headship rates over time may suggest increasing constraints on establishing independent livelihood, or increased tendency to 'jointness' in residence among adults. Both tendencies would have clear implications for other elements of the family system (Burch et. al. 1987, 22).

5) *Life course transitions of individuals*: since the life of most individuals from historical populations evolved around household, individual life course transitions can be translated into changes in household position (Wall 1987, 82 ff). With the 'synthetic cohort approach' commonly used with cross-sectional data, the life course household position of different age groups in the cross-section (measured by the relationship of individuals to the head of the household according to the individual's age and sex) can be assumed to represent likely an averege experience of a real cohort passing through time, providing that such a group of individuals could be followed longitudinally. Changes in the percent distribution of different positions within a given age group over time may, in turn, be indicative of changes in the timing

of life course transitions and/or structural shifts in the sequence of roles an individual was commonly passing through (Kok 2007).

6) Leaving home patterns: LHP constitute a special case of life course transition. Societies with different patterns of leaving home are often considered representing entirely different family systems (Hajnal 1982; Reher 1998; Billari et.al. 2001), or as having different 'life course regimes' (Mayer 2001). Not only that changes in LHP reflect changes in the relationship between young adults and parents, different patterns of individualization and of intergenerational solidarity. Since leaving the parental home for the first time is usually the first and often one of the most significant migration decisions in the life course (Pooley & Turnball 1997, 390), it is therefore often determinative of later sequences in the life course trajectories: transition to marriage, headship and parenthood, and also of entering the labor market (Poppel & Oris, 2004). Leaving and staying of children at home depended on variety of factors including production and income pooling function of the domestic group, children's sex, patterns of the labor participation of children, and regional labor market characteristics (Wall 1978, 1987; Bras & Kok 2004, 423-429). This is why changes in the speed of the exit from parental home are potentially revealing both for tracing internal dynamics of the family life, as well as for placing these family developments within wider socioeconomic context.

7) *Residential patterns of the elderly*: Living arrangements of the aged is particularly good indicator of intergenerational coresidence, and the one which is less affected by variation in demographic conditions than household-level measures of family structure (Ruggles 2009, 252). Family systems may differ substantially in the way they perform their welfare functions to the most vulnarable fractions of the population (Smith 1981; Laslett 1988; Cain 1991; also Oris & Ochiai 2002). This is particularly well reflected in the residential patterns of the elderly people (Kertzer & Laslett 1995; Dillon 2008; Szołtysek, 2008b). What kind of position do the elderly find themselves in, and how does this change with urbanization?

8) *Service system*: the existence of a specific pattern of life cycle service is commonly agreed to be one a constitutive centerpiece of the eccentric northwestern European marriage and household formation pattern ensuring late marriage and the formation of a new production and consumption unit at marriage (Kussmaul 1981; Hajnal, 1982; Gates & Hendrickx 2005). The circulation of youths helped to equalize the supply and demand for labour across households differentiated by wealth and stages of family life cycle (Dribe, 2000; van Poppel and Oris, 2004). Domestic service, as well as apprenticeship, facilitated the accumulation of savings for the establishment of new households, and was also believed to promote economic growth in Western Europe, where it was supposed to strengthen 'acquisitory impulses' along with

'individualistic' behaviour (Macfarlane, 1978; Hartman, 2004; Fauve-Chamoux 2004). Since in the European past servants and apprentices were commonly treated as household members, changes in the incidence of this substantial stratum, as well as in the latter's demographic profile, encapsulate important structural shifts within a given family system. Despite having been an essential institution in early-modern England, life-cycle service slowly died during the transition from a pre-industrial to a fully industrial economy (Cooper 2005).

B) Other methodological considerations

Before presenting the results of our investigation it is necessary to make some additional notes on matters of methodology. Normally, the eight main constituents of the family system discussed above can be meaningfully analyzed with the use of cross-sectional census data[17]. Since we are analyzing changes of household structures over time using two separate population censuses, a constant effort had to be made, however, to make sure that we are comparing actually the same unit called 'household'. Even slight differences in definitions of a household will yield different data (Schmid 1988, 14). In this regard, despite the relative wealth of material that was availabe to us, we faced certain difficulties. Whereas the census of 1867 has had borders between households clearly assigned during the process of collecting the census data, the census of 1819 has no such household borders in the census manuscripts delineated. It is a list of inhabitants without clear designation, where one household ends and where a new household starts. There is also no information about the address of the people in the census manuscripts.

How can we cope with these data insufficiencies? Do they inhibit our research goals entirely? Is it possible to invent a realistic and meaningful way to delineate households in the 1819 census? A household has been defined by Laslett as a coresident domestic group, as a "series of names of individuals in blocks, with clear indications of where one block ended and the next began" (Laslett 1972a: 24). This coresident domestic group has three characteristics in common: sleeping under the same roof, sharing a number of activities, and being related to each other by blood or by marriage. In addition there may be occasionally non-related persons, like servants, visitors, boarders, or lodgers, members of a household (Laslett 1972a: 25). Later definitions presented by R.Wall concentrate on the first two characteristics (Wall 2001b). Households are similarly defined in contemporary demographic discourse (Schmid 1988, 14-15; Ermisch 1988, 23-26). The apparent straightforwardness of the definitional approach notiwthstanding, extracting household data from historical micro-census counts can not seldom be complicated and confusing task. The problems we faced presented itself to us as an extreme

[17] Note, however, Ruggles' remarks regarding sensitivity of household-level measures to demographic conditions (Ruggles 2003).

case of difficulties other scholars working in the field have been facing too (Berkner 1972, 1975; Hammel 1984; Hammel & Wachter 1996a, 1996b; Sovič 2008).

Interestingly, in a published version of the Rostock census of 1819, based on a database which has been created for historical research, the city's population is represented by households (Manke 2005). These 'households' were 'created' during the data entry of the census based on the characteristics of a person's last name, marital status, sex, property, relationship to household head, and occupation (Manke 1997: 131). A household such defined would contain the nuclear family of parents and unmarried or economically dependent children, coresident relatives, personnel (domestic servants, employees), and other persons (e.g. boarders and lodgers) (Manke 2005: 18). The basic criteria for being a head of a new household were the following:

- being adult,
- no relationship to a member of the previous household or family,
- no immediate dependent employee.

Another decisive factor for heading a household was having an income while not being a living-in-employee like a servant (project documentation). Manke states that this was relatively unproblematic (Manke 1997: 131, endnote 12), but later he is more skeptical about the effect of the missing household borders (Manke 1999: 651; Manke 2005: 458). In a book about the city of Rostock between 1750 and 1850 he again downplays this problem (Manke 2000: 346).

Although the rules might present themselves as pretty much straightforward, they actually led to overcounting the number of one-person-households, very often lone elderly people (table 2; 1819 file A). This fact was recognized by Manke, but was not considered a problem (Manke 2000: 19, 346). In consequence, people who lived in a poorhouse or soldiers were treated as individual households in this file and also in the published edition of the census. This is why a second file was created, which allowed for the creation of institutional households and the inclusion of more people into the previous households. The factor of having an income was considered in a more restricted way and therefore fewer persons qualified for heading an independent household (see 1819 file B in table 2).

In the next stage we decided to test the quality of both files with an algorithm that creates households according to a strictly defined set of rules[18]. The census of 1867, which was not affected by definitional problems discussed so far, was taken as our reference point for designing such rules of assigning people to household units and for assessing the apriopriateness of the algorithm's fit to the 'real' data structures. Artificial household structures simulated along

[18] We thank Josh Goldstein (MPIDR) for directing our attention to these possibilities of overcoming the deficiencies of the 1819 census.

common set of rules for both 1819 and 1867 censuses have yet another advantage. By imposing standar scenarios of household membership on undifferentiated groups of individuals in both enumerations, we intended to approach a required comparativeness of two datasets more effectively[19].

Our algorithm excercise was a two-fold process, back and forth between calculation and thorough comparison of the real and simulated structures. We conducted a number of experiments using various scenarios for assigning individuals to domestic groups with the intention to obtain most satisfactory match with 1867 census, and – if possible – with 1819 census as well. After several modifications our household membership rules consist now of the following principles[20]:

- a person belongs to the previous household, if

- the family name is the same
- the occupational title belongs to a list of occupational titles indicating co-residence (e.g. servant, apprentice, journeyman) and the person is unmarried
- the relationship to the household head indicates this
- the occupational title is the same as the previous one and the person is not married
- the person is absent at the time of the census
- there are indications of belonging to an institutional household (e.g. poorhouse, being mentally ill)
- the person is unmarried and below the age of 20 years
- the person is an unmarried woman below the age of 25 years
- there is no information about the relationship to the household head and no occupational information
- the person is a married woman and has no information about the relationship to the household head

[19] Our optimism, however, is strongly limited in this regard by the fact that more information is missing in the census of 1819 comparing to 1867. In the earlier census only 41.2 percent of males have an entry for relationship to household head and 77.7 percent for females as compared with 92.9 percent for men and 93.3 percent for women in 1867. The percentages for occupational titles are likewise lower for men (66.2 / 79.2 percent) and women (26.6 / 40.1 percent) in 1819 as compared to 1867.

[20] The first assumption for dealing with this problem is, that the members of a household were registered consecutively. According to Manke, this procedure is confirmed by other scholars (which ???)[20], although the German Customs Union (Deutscher Zollverein) obliged its member states to count the population according to households only in 1843 (Manke 2005: 457). The order of the persons within a household was not always like a sequence household head/wife/children/servants (Manke 2005: 458), and therefore the algorithm could not be build upon such a sequence.

- the person is an unmarried woman between the ages of 20 and 39 years and has no occupational information

Table B presents the results of the algorithm, which are quite fine for the file of the 1867 census for the first two measures, but much less fine for the overall measure of complete matches of households. The 1819 files have results which reflect their number of households: the larger number of households in file A leads to a higher number of household heads who are not found by the algorithm and a lower number of additional household heads created by the algorithm. The overall fit is better for file B. Better still, we can be sure that more than 80 percent of all households in all files are defined correctly and therefore for most of the results there are only minor effects of using different household limits.

Table B: Results of the algorithm, version 5

Census file	1819 file A	1819 file B	1867
Number of households	4,098	3,601	6,826
Number of households according to algorithm	3,924	3,924	6,715
Household heads not found	364	143	491
Percentage	8.9 %	4.0 %	7.2 %
Household heads found in both files	3,734	3,458	6,335
Percentage	91.1%	96.0%	92.8%
Additional household heads created by the algorithm	190	466	380
Percentage	4.6 %	12.9 %	5.6 %
Complete matches of households: not matched	774	642	1,145
Percentage	18.9 %	17.8 %	16.8 %

Still, however, we thought more elaboration was needed to finally make the decision which of 1819 files seems to be more suitable for comparative statistical analysis. This is why in the second step we focused on assessing the effects of the algorithm on household structures and compared household types of all three files with the typology of the households simulated by the algorithm. As can be seen from **table C**, there is almost no difference between real and simulated household structures for the 1867 census. The only minor difference is a slight increase in the number of solitaries at the expense of simple family households.

The algorithm for the census of 1819 resembles much more file B with the exception of solitaries (relative similarities of proportions nuclear and extended families, along with almost absolute sameness of results for other types of domestic groups seem to be critical here). Still, however, the observed mismatch of data for solitary households between simulated files and groupings from 1819 file B has two implications. First, since we know that the algorithm generally overecounts the number of solitaries and undercounts the number of simple households by approximately 2 percent, we may think of the discrepancy between the two files as

being a little bit smaller tha it is suggested[21]. On the other hand, our knowledge of literature and existing datasets prompt us to consider proportions of solitaries in the 1819 file A as unbelieveble high. Litchfield's study of nineteenth-century cities reports of only one case of having a share of 18 percent for households of people living alone or with non-kin only. All the others had lower percentages (Litchfield 1988; also Reher 1987). The highest proportion of solitary households ever registered comes from the 1802 census of Rheims where they constituted 19% of all domestic groups (Fauve-Chamoux 1983, 481; see also Duben & Behar 1991, 41). The high proportion of solitaries in file A would exceed all these examples by far. This is the rationale behind our decision to use 1819 file B rather than A for all subsequent tabulations presented in this paper.

Table C: Comparison of percentages of household types

	1819 file A	1819 file B	1819 algorithm 5	1867 file	1867 algorithm 5
1	27.4	17.4	25.6	17.8	19.9
2	5.4	2.0	2.4	2.7	2.7
3	53.4	75.3	67.7	71.1	68.4
4	13.5	5.1	4.2	8.3	8.6
5	0.1	0.1	0.0	0.1	0.0
6	0.2	0.2	0.2	0.8	0.3
N	4,098	3,601	3,924	6,826	6,715

Note. Type 6 includes institutional households.

III. Family system in Rostock: comparison of 1819 and 1867 micro-census data

Marriage

Age at first marriage was high and remained pretty stable over the entire period under investigation. Men married on average at an age of 30.5 years and women at an age of 27.7 years according to the marriage registers of the parish of St. Jacobi during the years 1863-1872 (no. of records?). The Singulate Mean Age at Marriage (SMAM) yields similar results: 30.5 and 27.4 years in 1819 and 30.3 and 28.2 years in 1867. However, proportions of never married in various age groups reveal important compositional shifts (**figure 1** in the Appendix). Up to the age 30 there were no differences in percentages unmarried in different age groups among both sexes between 1819 and 1867. The only exception here seems to be the arrestingly high quota of celibates among males aged 20-24 in the latter census caused by the presence of large numbers of

[21] Another factor contributiing to different results of the algorithm for both censuses can be related to the larger amount of information missing in the census of 1819 comparing to 1867.

unmarried soldiers residing in the city in 1867. The only important change took place among middle-aged males (age group 30-49). In both censuses, the shift from age group 25-29 to 30-34 was marked by a approximately 65% decrease in the quota of unmarried males but after that point, male entry into marriage market had become much faster in 1867 indicating better marriage opportunities for these age groups as compared to 1819. For women the reverse pattern can be observed: after the age of 34 constraints on female marriage seemed to have been at work in 1867 as compared to the data from 1819. This differential nuptiality behavior of middle-aged females in two censuses seemed to have also longer-term consequences. In the age group 50+ the number of celibate women is still higher in 1867 (16.26 to 18.95%). Despite these changes in the middle and later stages of the life course, the marriage pattern are rather similar during the period between these two censuses.

Household structure

Nearly three quarters of all households in 1819 Rostock were of nuclear structure, and all other types of domestic groups but those of solitaries appeared in only negligible numbers (**table 1** in the Appendix). The cumulative percentage of all complex households (extended and multiple-family together) only slightly exceeded 5%. Out of almost four thousand of households, only 5 displayed multiple-family structure. Such structural distribution of household types in Rostock pertains to the prevalence of a strictly nuclear family system in the city, also characterized by significant share of solitary households[22].

The comparison of those figures with data from 1867 reveals only minor shifts in proportions of different household types between two censues. First, there was a slight, four-percent decrease in proportion of nuclear families, which was paralleled by a comparable rise in the share of extended ones. Although the number of the latter nearly doubled in relative terms, the 1867 census still featured only very small proportion of households with extension, generally smaller than in preindustrial and industrializing England (Laslett, Wachter & Laslett 1978, 70-72; Laslett 1977, 21-21)[23].

The discussion of proportions of different types of households can be further supplemented by looking at overall percentage of domestic units containing coresiding kin other than offspring. Since our category is now more inclusive (apart from extended and multiple-family units it also includes households of Laslett's type 2), we end up with slightly higher figures than before. In 1819 households with kinsmen beyond the nuclear family constituted 7.10% of all

[22] By solitary households we mean here domestic groups headed by solitary persons, and not the single-person households.

[23] Laslett proposed the figure of 10.1 percent extended households for preindustrial England. In the city of Rotterdam, extended families varied from 6 to 13% between 1810 and 1880 (Janssens 1986, 29).

units, while their respective share in 1867 was 11.29%. Here, the general direction of change among households with kin coresidence is confirmed, whereas the amount of percent change between the censuses is only slightly larger than if we look at extended and complex families alone (3.23% to 4.19%). All in all, however, figures for both 1819 and 1867 contain siginificantly less complex households comparing to experience of the inhabitants of the mid-nineteenth century Preston, where 23% of all households contained related persons other than members of the conjugal family (Anderson 1971, 44).

The comparison of the 'real' data in tabel 1 also points out the stability of the pattern among solitary households over time. However, keeping in mind all reservations made so far regarding the data structure of 1819 census, one has to be careful in assigning too much of the importance to this observation.

Structural distribution of simulated households generally confirms trends already detectable in the real data, with only minor shifts in comparison to the latter. It points to only a very small change in the overall household structure pattern in the city over time. Although the rise in coresidence with kin (as revealed by proportions of households type 4-5) manifests somehow stronger among synthetic households (change by 4.5%), the overall change remains small and final levels of households complexity are still below the English standard (Laslett, Wachter & Laslett 1978, 71). Again, the suggested change over time in propensity towards living alone must be taken with caution.

In generally, if we assume that socioeconomic changes that were taking place in Rostock between 1819 and 1867 should have an affect on prevailing household structures, we must conclude that both observed as well synthetic changes in the household pattern seem to be rather trivial. Whether our observation of change in coresidence with kin is to be taken as a justification for Anderson's 'adaptation' hypothesis is disputable. Truly, the change goes in the predicted direction, but the amount of that change seems to be too small to prove the hypothesis.

If the observed increase in extended family households was not artificial[24], then it could be thought of as being an effect of changing residence behaviors, a change in the relative proportions of groups within the urban population showing different residence behaviors, or alteration in other demographic parameters such as increasing life expectancy. We do not have enough information yet to do research into these possible reasons for this increase.

To get the better sense of possible changes in household structure patterns between two censuses, we analyzed dynamic features of household organization in 1819 and 1867 (**figures 2-**

[24] It cannot be ruled out that the increase in the proportion of extended households in both tabulations could be artificial: since the 1819 census provides less detailed kin relationships within domestic groups, it may be that some of those from the pool of solitaries might have actually been coresiding kin in 1819.

5). The figures reveal a rather well-marked pattern of changes in family composition over the age of household head. In general, patterns for 1819 and 1867 are more or less compatible, both with regards to real and synthetic data. As could be expected, the incidence of nuclear households predominated throughout the entire life cycle except the youngest heads. In all datasets, over 80% of male heads aged 25 to 64 were heading nuclear households. The only slight difference in life cycle pattern of nuclear families over time seems to occur at older ages in 1867 where the increase in coresidence with relatives smoothed the otherwise quite precipitous decrease in proportion of simple family households comparing to 1819. The most siginificant difference between 1819 and 1867, confirmed by both real and simulated data, regards a large increase in the share of solitary households among the youngest heads (15-19 and 20-24), only to a limited extent accompanied by rising tendency for heading solitary domestic groups in later ages. In the 1819 real data, 56.3% of cumulative number of youngest heads (aged 15-24) were heading solitary households, whereas in 1867 this proportion increased to 86.8%. Synthetic household data yields even more striking evidence of that change (respectively: 56.9% to 91.3%). These patterns signal that some important shifts have been taking place in Rostock between the censuses. First, the link between entry into marriage and entry into headship must have weakened over time. This, in turn, may be indicative of increasing opportunities for young people to form independent households and cope with all difficulaties associated with heading them without support from other immediate kin. The observed change also suggests growing importance of households devoid of their socialization functions. All in all, we hypothesize that such significant increase in proportions of solitary households among younger heads represents an important departure from more 'traditional' household life cycle patterns. To some extent, this may be indicative of the emergence of a new sequence of life course transitions within some segments of the population: leaving home – heading alone an independent household (with or without other non-related coresident people) – establishing a nuclear family household at or after marriage. This small fraction of the city's male household heading population (1.4% in 1819, and 2.3% in 1867) may then be taken as representing innovative behavioral patterns[25].

The numerical importance of particular household types among the populations under study can be made better sense of by inferring the intersection between individual and household life patterns from age structure by household membership (comp. Lee & Gjerde 1986, 94-95). **Figures 6-9** give estimates of proportion of the entire population found in various types of households separately for 1819 and 1867, separately for real and synthetic data.

[25] This seems to be partly confirmed by the data on leaving home patterns presented later in the text. At this stage more detailed characteristics of this group cannot be provided.However, may well be that some of them were part of the immingration to Rostock from the neighbouring rural areas.

In all datasets the overhelming majority of children below the age of 15 (more than 80%) spent their childhood and early teenage years in nuclear households. A slight rise in the share of population living in extended households over time represents another pattern, otherwise very stable across all age groups in all datasets[26]. Thus, living with relatives cannot be attributed to any specific age group of the city's population neither in 1819, nor in 1867. Contrary to this, living in solitaries had a better pronounced life cycle pattern: in all datasets it mostly occurred among young adults and then elderly people. The only subset of population which seemed to be strongly affected by this life cycle change, were the aged. The direction of change among the elderly, however, is represented differently in the original and synthetic data. The former suggests a decrease in proportion of the elderly aged 65 and more living in nuclear households in favour of more pronounced tendency for them to live in extended, but more often in solitary or no family households. Whereas the synthetic data points to the same pattern regarding living in households with kin, it also suggests a siginificant decline in solitary living among the eldery over time. At this moment we have no sufficiently refined methodological tools to solve this problem. However, providing there was a tendency for the algorithm to multiply the number of solitary households in older age groups in 1819 census, we tentatively suggest that a moderate rise rather than decline in living in solitary households seems to represent better the real development over time.

Household composition

Analysis of household composition in Rostock privides more detailed view of the internal dynamics of family systems between the censuses. First, there was no detectable change in the mean number of residents per domestic unit between 1819 and 1867 censuses. Both in 1819 and 1867, an urban household in Rostock had around 4 persons on average[27]. Equally, almost no change is revealed when the mean experienced household size is taken under scrutiny (5.95 to 6.05)[28]. Similarly, no distinguishable trend is visible when the focus is on 'houseful' defined such as to include also inmates, lodgers and other coresiding non-kin (4.28 in 1819 to 4.21 in 1867).

Various measures of household size, however, can still be too crude and they may still obscure important compositional shifts among different subsets of population and groups of households. By looking at proportion of people living in households with different sizes in 1819 and 1867, the occurrence of compositional shifts in the population can be inspected (**figure 10**).

[26] Although the share of population living in extended families trippled in absolut terms (from 1119 to 3442), the relative change was much less pronounced (7.36% to 12.10% of total population 1819-1867).

[27] MHS is here defined along the rules suggested by Laslett 1972b, 133. It encompasses members of core families, their coresident kin together with servants attached to the household, but excludes inmates, lodgers and other non-kin.

[28] See Halpern 1972, 409 for a definition.

When real data from 1819 and 1867 are compared, however, proportions of people living in households consisting 1-3, 4-6, 7-9 and 10+ persons are basically identical in both enumerations. Similar stability is revealed when proportions of households of different sizes in both censuses are scrutinized (**figure 11**). This picture is generally corroborated by the synthetic data. In this regard, the only more pronounced difference concerns proportions of households with 1-3 persons. It's probable cause, however, can be related more with the artifical increase in solitary households due to the working of the algorithm on the 1819 data, than with the real trend.

More details regarding internal composition of households in two censuses are presented in **table 2** which focuses on two groups of coresidents: offspring and relatives. Basically, there is a striking stability of the pattern over time among offspring. A slight increase in the overall percentage of coresiding relatives in the population corroborates our previous observation regarding the increase in propensity towards coresiding with kin that took place between two censuses. On the other hand, however, the change in the mean number of relatives per household is almost negligible (0.09 to 0.14) and suggests that at the level of an 'average household' the amount of change was trivial.

More detailed view on types of coresiding kin and the change in their respctive share in the total population is given in **table 3**. This data suggest that the slight increase in coresidence was caused equally by rise in coresidence with parents as well as with lateral kin of other kinds. Until now we do not know whether this was caused by a changing pattern of coresidence, transmission of property, increasing care for the elderly, or simply an effect of increasing longevity in the case of parents. All in all, however, the numbers here are very small. More important is the fact, that in both censuses almost one quarter of the city population was made up of persons not related to the respective household head (servants, lodgers, and other non-kin)[29]. This should reflect the traditional pattern of having servants or other employees like apprentices living with their employers still existing far into the 19th century in Rostock.

Household formation patterns

With **figure 12** an attempt is made at examining changes in age-specific headship rates over time. Since female patterns of headship seem to be highly sensitive to procedures for setting up borders between households through the algorithm, we ficus here on male population only.

Two issues stand out. First, the match between real and synthetic data is almost perfect, particularly for age groups up to 40-44 years. More important, both real and synthetic datasets seem to be identical in terms of male household formation patterns. For males in both 1819 and

[29] Some of them may actually have been relatives, but they are recorded in the census manuscripts under their occupational relation to the household head and not their kin relationship.

1867, headship rates rose steadily up to age 35. After that, the process continued, although with much smaller pace, leading finally to peak values of male headship among those aged 44-54 years. Only then, a discrepancy between 1819 and 1867 censuses can be observed (still, of rather small magnitude). For example, in the age group 50-54, only 2.6% of males were not heading households in 1819 census, whereas corresponding proportion of men in 1867 more than doubled (=6.2%). The difference disappears, however, in subsequent age groups.

However, what really matters in uderstanding the very process of household formation, is the actual relationship between marriage and entry into headship (Hajnal, 1982, 463 ff.). Data pertaining to the understanding of this important link is shown in **figure 13** (real) and **figure 14** (synthetic). The overwhelming majority of those who married at around 1819, also became heads of households, either at marriage, or shortly after that. In other words, for the population of the earlier census the entry into mariage was essentially linked with household formation[30]. This link between marriage and entry into headship became weakened in 1867, particularly for adult males. Although after the age of 34 there was continuous increase in proportion of ever married men, this was not accompanied by a similar pace of entry into headship any longer. In age group 35-39, 98% of married males were also heading independent households in 1819, whereas in 1867 the respictive figure was only 94% (6% of ever married males at this age were not heads in 1867, comparing to 1.7% in 1819). Only among the elderly males aged 65 and more the 1867 figures converge with earlier census data.

On the other hand, in both censuses there has always been a small fraction of males who were heading their own households despite of never been married (approximately 4-7% of all males in respective age groups). Pattern of changes in this interesting phenomenon over time is better illustrated on the same chart by two respectives dashed lines (**figure 15)**[31]. Drastically discrepant patterns among younger heads between 1819 and 1867 must be attributed to the steady development of the city's university and the related significant influx of young adults occupying independent households. By the age of 30 much of the difference between two populations disappeared paving the way, however, for consistent decrease in proportions of never married heads among adult males between 1819 and 1867.

[30] The overall, mean difference between percentages of ever married males and ever married heads in all age groups, was minimal and was equal to 1.64%.

[31] Basci pattern from table 15 is to a large extent replicated with synthetic data in **figure 16**.

Life course transitions of individuals

Figures 17-20 show changes in an individual position in the household measured by the relationship to the head of the household, according to the individual's age, sex, and the census year[32]. Patterns of male life course positions in the household in both censuses corroborate most observations already made. Up to the age of 20, the two listings are almost indistinguischable. After that point, the numerical importance of children as coresidents diminished considerably more for 1867 than 1819 population. The context of these divergent leaving home patterns seemed to be related to the tremendous rise in proportion of coresident lodgers among young adults. That rise was most probably caused by the presence of large numbers of soldiers in the city who rented part of the premises from householders to whom they were not related. This upsurge in the number of young, mostly unmarried, people in their 20s not having yet attained headship, can also explain a delayed increase in headship rates among adult males in 1867. If that would be the case, then the observed pattern may only indicate a temporal alteration and not a behavioral change related to household formation at these younger ages. Contrary to 1819, elderly males in 1867 tended to live in households of relatives rather than coreside with non-related heads.

Developments among females in 1819 are matching very well those of the same sex in 1867, apart from slight increase in headship rates over time. It cannot be stated with certainty, however, whether significant shifts observed among elderly women between 1819 and 1867 (increase in female headsip rates in later stages of life; decline in coresidence as inmates in favor of living in households of relatives) should be taken at their face value. Artificial effects caused by defective information in 1819 census cannot be ruled out here.

Additional exercise may shed some more light on male and female residential opportunities, and the way they changed over time (**figures 21-24**)[33]. In this case, all individuals listed in households were classified according to whether they were or were not members of a core family group, defined as including unmarried children resident with at least one parent, married couples, and lone parents. All persons who were not members of core families were classified according to whether they lived with relatives, with non-relatives only, or alone. Contrary to the previous exercises, in this case the relatives have been identified not by their relationship to the household head but by their relationship with any household member

[32] Since original and synthetic data was almost identical for 1819 and 1867, only the former is displayed.
[33] Again, because of relatively good match of real and synthetic data for 1819 and 1867, only the former are displayed.

(including inmates) in the absence of closer family ties (see Wall, 1998). The relationships within the household of each person change over the individual life course. Overall we can distinguish tree stages for the inhabitants of Rostock during the 19th century: during childhood (age groups 0-14 years) most young people lived as children with at least one of the parents; during youth and young adulthood (age groups 15-24 years for women and 15-29 years for men) at least half of them coresided with people with whom they had neither closer nor any other kinship ties; and in adulthood most of them lived in conjugal units, either with or without children. However, there were people in each age group who lived in a constellation differing from that of the majority.

The proportion of men living as a non-relatives in the second stage of life increased between the censuses, what can be attributed in part to the fact of military service. This led young men to leave the parental home in addition to the ones leaving home because of occupational or educational reasons. Also in adult life some 10 percent of individual males shared domestic units only with non-related persons (either they lived as non-relatives in someone else's household or they head their own household with only non-related people). This share was higher for older people and especially high for women in 1819. The latter pattern, however, seems to be potentially affected by the procedures for setting up borders between households, since the algorithm yields lower percentages of older women as non-relatives.

According to all datasets, equally few males lived completely alone both in 1819 and 1867 census. Also, there was no change between the listings in the share of lone fathers aged 60 and more (10%). Living with related people other than a spouse, child or parent, was generally quite uncommon both for men and women, and in both censuses. However, between 1819 and 1867 this pattern of coresidence has somewhat gained in importance, particularly among older women.

One striking feature of the developmental pattern among women was the significant increase in the share of lone mothers in age group 60 and more. This trend is confirmed by both real and synthetic data (respectively: 16.7% to 26.4%, and 15.7% to 27.4%) and seems to point out some important demographic and residential alterations taking place between the censuses. Overall the changes during these 50 years were rather small and affected almost exclusively the older population.

Finally, we analyzed the proportion of the population living with father, mother and own child by age groups (**figures 25-27**) shows the pattern of leaving home in age groups 15-19 and 20-24 years for both sexes. This occurred earlier for men than for women and fewer men lived with their parents in the age group 20-24 years in 1867 as compared with 1819. For women we cannot observe such a change and also later in life there were only minor changes, mainly because the percentages were very low. However, there were changes in the youngest age groups: the

share of children living with their parents increased in this time period, which could be attributed to a decrease of adult mortality or more likely to fewer children being raised as foster children because of the social or living conditions of the parents or the mother.

The high age at marriage led also to childbearing later in life: only in the age-group of 30-34 years half of the population had at least one own child living in the same household. We can observe that the peak was reached in the age-group 45-49 years, when more than 70 percent of men and more than 60 percent of women had at least one child in the same household. These shares were higher for the second census and indicate slightly higher chances of successful reproduction. The high proportion of childless people (about a quarter of men and a third of women) is to a large extent the effect of the high share of permanently unmarried people. After the peak the percentage of adults living with at least one child steadily decreased and in the oldest age group (80 years and more) less than 40 percent of men and less than 30 percent of women coresided with a child. Among this oldest age group we can observe an increase in coresidence with a child in 1867.

Patterns of leaving home

Analysis of sex-specific patterns of leaving home in both censuses corraborates our previous observation of the important family change taking place between 1819 and 1867 (**figures 28-29**). Non-negligible discrepancies can be observed in the exit rates of males and females between the censuses. In general, children of both sexes were staying at home longer in 1819 than in 1867. This increase in exit rates over time should be reflected in compositional changes in the city's occupational structure. Unfortunately we do not yet have occupational titles coded and therefore we can only speculate about the reasons for the observed change in patterns of leaving home. More 'traditional' patterns detected in 1819 might have been related to protoindustrial, that is more domestic based, forms of household production which was disappearing over time. Increase in the number of urban children instead of rural children, leaving home to work as servants or apprentices in households of others in Rostock, might also be at work. Also, the increase in schooling that was taking place in the city since 1840s might have risen the number of children in boarding schools.

The fact that children were leaving home earlier in 1867 also means that the chances to form multigenerational lineally extended households were decreasing over time. Apparaently, we have more complexity in 1867, but it must have resulted from other forms of intergenerational jointness.

Residential patterns of the elderly:

Figure 30 shows both stability and change in residential patterns of elderly male heads in real and synthetic datasets. Despite increase in children's exit rates from home between 1819 and 1867, living with child and spouse (with or without others) remained the most widespread pattern of coresidence for the elderly in both censuses. Also the proportion of coresidents with spouse only remained at a stable level of some 15%. However, increasing speed of leaving home over time is confirmed by the fact that proportion of male heads coresiding with spouse in the absence of children is consistently higher in real and synthetic data from 1867. Nevertheless, all these figures mean that in both censues the majority of male elderly heads still coresided with at least one member of their immediate conjugal family. Both real and synthetic data pertains also to slight increase in the male heads' coresidence with relatives only, which was the part of a more general rise in extended-family arrangements. Finally, these processes among male elderly heads were accompanied by decline in living alone or with non-relatives only. This observation runs contrary to the usual structural-functionalist assumptions regarding the effect of urban life on family.

The living arrangements of older women (65 years or older and being either head of a household or the wife of a household head) is very much affected by the method of delimiting households (**figure 31**). Therefore the actual living arrangements cannot be reconstructed with certainty. The only result we can present until now is that fewer women lived with their spouse and a child, and more women lived alone or with a child, but no spouse. This is not surprising, since most women were younger than their husbands and therefore more women became widows than men became widowers.

Service system

There was a decline in the overall proportion of servants between 1819 and 1867 (**table 3**), from 16.9% of the total population to 14.2%. However, the mean age of servants remained stable between the censuses, as did the patterned tendency for female servants to be older on avegare than male servants. In 1819, as well in 1867, mean age of servants remained at around 22-23 years for males, and 25-26 years for females. In order to move beyond this highly aggregated measure we need to look more carefully at the age structcure of servant population (**figure 32-33**).

Figure 32 confirms there was a decline in service over time. However, this change did not affect males and females in the same way. Proportion of males as servants declined proportionally among all age groups with the exception of the youngest. Among females, however, a similar change affected most strongly the prime age group of female servants (20-24 years old).

Surprisingly, there is almost no change in servants distribution by age (**figure 33**). There seems to be a contradiction of the almost unchanged age structure of servants (male and female) in 1819 and 1867 and their decrease in the share of the respective age groups of the whole city population. The age structure of the servant population remained unchanged, but there has been a larger population increase in some age groups which reduced the share of the servant population. This should be the effect of rural labor migrants coming to Rostock in search of jobs in the expanding industrial and service sector. We do not have yet all the necessary data to verify this tentative observation.

This overall pattern of the decline in service is also reflected at the household level (**figure 34**). However, this decline has a clear life cycle pattern: young heads and those in the middle age seemed to be affected by diminishing ranks of servants most profoundly. The decreasing share of households with servants according to the age of the head indicates a change affecting the younger and middle generation, but not the older one. It looks like the older generation still behaved in a more "traditional" way, while an increasing number of younger household heads turned to a more "modern" type of household. This behavioral trend could have equally been the result of some unobserved changes in the production functions of household.

To lear more about the internal working of the service system we computed the average number of offspring and servants per household by the age of the household head for both censues (**figure 35**). The comparison of information from 1819 and 1867 reveals almost no change in the average number of offspring, only in the group of older heads it decreased between the censuses. The average number of servants was diminishing according to the decrease in the share of households having servants. This notwithstanding, in both datasets there exists a positive correlation between the number of children and the number of servants. Therefore, in both census there is no replacement either of children by servants or of servants by children as can be observed in rural households.

IV. Conclusion.

Overall we can observe rather stable patterns for both censuses, 1819 and 1867, for Rostock. Age at marriage was quite high and also the proportions permanently unmarried were high, especially for women. The majority of the households were nuclear family households, solitaries were following on the second rank. The average household size was about 4 persons and about a quarter of the population was not related to the respective household head. Most people left home as teenagers or young adults and marriage was closely connected with obtaining headship

in a household. Most elderly persons lived with a spouse and / or a child, but a considerable proportion also alone (especially women). Most people lived as children in the parental household and as part of a couple in adult life. In between about half of them had a phase of living with non-related people. A considerable share of them were servants, which showed a clear life-cycle-pattern.

Changes during the 50 years between these two censuses can be observed at first among the younger age groups. It was among those subsets of the city population that the emergence of a new sequence of life course transitions can be detected. They left home earlier and a rising proportion lived either alone or as non-relatives in other people's households. The proportion of servants among those unrelated persons diminished during this time period. There were better marriage opportunities for middle-aged men, but worse marriage opportunities for women in the same age group. However, the connection between marriage and obtaining headship significantly weakened, leading to higher quota of never-married, male household heads in 1867. There were also rises in successful reproduction and in coresidence with children in old age. A significant rise in the share of lone mothers among the aged points to the same direction.

A slight increase in extended family households and in the proportions of households containing relatives besides the nuclear family core points to an increasing propensity to coreside with relatives. However, an overall change in the household structure pattern in the city remained very small over time. Whether our observation of change in coresidence with kin is to be taken as a justification for Anderson's 'adaptation' hypothesis is disputable. Truly, the change goes in the predicted direction, but the amount of that change seems to be too small to prove the hypothesis.

We can therefore observe only small shifts from more "traditional" towards more "modern" patterns. In general, if we assume that socioeconomic changes that were taking place in Rostock between 1819 and 1867 were powerfully linked with structural alterations in prevailing patterns of the family, such trivial changes in household system (both observed and synthetic) in the population under study inevitably surprise. It is possible, though, that Rostock of 1867 was still anticipating more drastic changes to take place in the last third of the 19th century.

By demonstrating such a striking continuity in the overall pattern of the family in Rostock despite undergoing proccess of social change, we join the camp of the increasing number of scholars arguing that family change may not be linked directly and immediately to structural social change (Kertzer 1984; Janssens 1986, 1993). We do so only partly, however, and with the feeling that implications of this study are very much different from Italian or Dutch cases. Considering the underlying theoretical tenets of this work, the fact that the persistence of the family pattern in Rostock rested primarily on the continuity of nuclear family-centred patterns of coresidence, puts

us in a truly paradoxical situation. Neither we detected a destruction of the traditional pattern of extended family household, nor we proved the progressive nuclearization of the family in Rostock between 1819 and 1867. Our refusal of structural-functionalist developmental theories points to an unambiguous fact that in nineteenth-century Rostock both 'tradition' and 'modernity' were marked by the prevalent nuclearization of coresidence.

This paradoxical situation prompt us to ask several interesting questions. While it can be true that structural differentiation within the social system does not produce the nuclear family in a causal fashion (Janssens 1986, 27), it may equally be true that social change and family change may not correspond at all. Was that lack of family change in the course of sociostructural developments in Rostock predetermined by the original nuclearization of the family system out there? If families continue to respond to turbulent social developments surrounding them according to traditional family patterns (Scott and Tilly 1975), should we think of the inhabitants of this historic hanseatic town as having been much better equipped to cope with challenges of the emerging urban-industrial life? What are the implications of the fact that the seemingly good 'structural fit' between Rostock nuclear family system and modernization processes of the nineteenth-century never fostered a truly advanced industrial community?

Is it inescapable to assume that further, post-1867 developments in Rostock would inevitably lead to the rise in extended living arrangements? Or, maybe, it is possible to conceptualize later and more intense structural differentiation of the social system in the city without any direct congruence with family change? But what if progressive modernization of patterns of the family would accelerate during the last three decades of the nineteenth-century? Can we imagine the population of Rostock as pioneering the move towards 'postnuclear family trends' (Popenhoe 1988, 295-306) already at the beginning of the twentieth-century? Answering those questions must await further investigation.

We have done many sums and have counted a great many things, and we hope we have demonstrated the validity of the approach taken here. Now it is time to discuss briefly the limitations of our study. First and foremost, the deficiencies of 1819 census must be mentioned. Undoubtedly, some of our estimations are potentially affected by missing household borders in 1819, as well as by limitations of the procedures for setting them up either by hand, or through the algorithm. However, we have tried hard to minimize those potential errors with five versions of the alorithm, and, in fact, most of the 'real' data results presented so far were consistent with synthetic files created by the computer program.

Some might argue that cross-sectional approach applied in this paper does not present itself the most suitable tool for studying the evolution of household structure over time (Janssens

1993). Not very much can be done in this regard, apart from intensification of our efforts towards having micro-census data from the 1900 enumeration soon ready for analysis. Still, we believe that reliable census counts for one population at three different point in time, together with continuous series of vital statistics over almost the entire nineteenth-century, opens up non-negligible opportunities for investigating family change. If there would be any significant changes in the life cycle pattern of household extention over time they should also be visible in the cross-section.

This preliminary study also lacks any attempt at examining the influence of social class on the structure of the households and life course patterns of the individuals. By developing a standardized system of occupational categories, this weakness will be overcome easily at later stages of research. It may turn out, then, that population agregates used in this study actually obscured social class-specific patterns of family change taking place in Rostock (Szreter 1996, 546-558).

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APPENDIX: TABLES and FIGURES

Table 1: Household typology according to Hammel-Laslett scheme

		1819						1867					
		real			synthetic			real			synthetic		
		abs.	%	Cat. %	abs.	%	Cat. %	abs.	%	Cat. %	abs.	%	Cat. %
1. Solitaries	1a	233	6.48	17.41	513	13.09	25.60	476	7.03	17.84	501	7.48	19.89
	1b	393	10.93		490	12.51		732	10.81		832	12.42	
2. No family	2a	35	0.97	2.00	41	1.05	2.37	101	1.49	2.75	109	1.63	2.75
	2b	37	1.03		52	1.33		85	1.26		75	1.12	
	2c	0	0.00		0	0.00		0	0.00		0	0.00	
3. Simple family households	3a	612	17.02	75.38	615	15.70	67.82	902	13.32	71.06	881	13.15	68.54
	3b	1627	45.26		1586	40.48		3146	46.47		2996	44.71	
	3c	106	2.95		113	2.88		111	1.64		109	1.63	
	3d	365	10.15		343	8.75		652	9.63		607	9.06	
4. Extended family households	4a	71	1.97	5.06	52	1.33	4.19	175	2.58	8.29	152	2.27	8.66
	4b	14	0.39		10	0.26		50	0.74		54	0.81	
	4c	57	1.59		44	1.12		183	2.70		170	2.54	
	4d	40	1.11		58	1.48		153	2.26		204	3.04	
5. Multiple family households	5a	0	0.00	0.14	0	0.00	0.03	2	0.03	0.06	2	0.03	0.04
	5b	3	0.08		1	0.03		2	0.03		1	0.01	
	5c	0	0.00		0	0.00		0	0.00		0	0.00	
	5d	0	0.00		0	0.00		0	0.00		0	0.00	
	5e	2	0.06		0	0.00		0	0.00		0	0.00	
Total		3595	100.00	100.00	3918	100.00	100.00	6770	100.00	100.00	6693	100.00	100.00

Note: Households of type 6 are excluded.

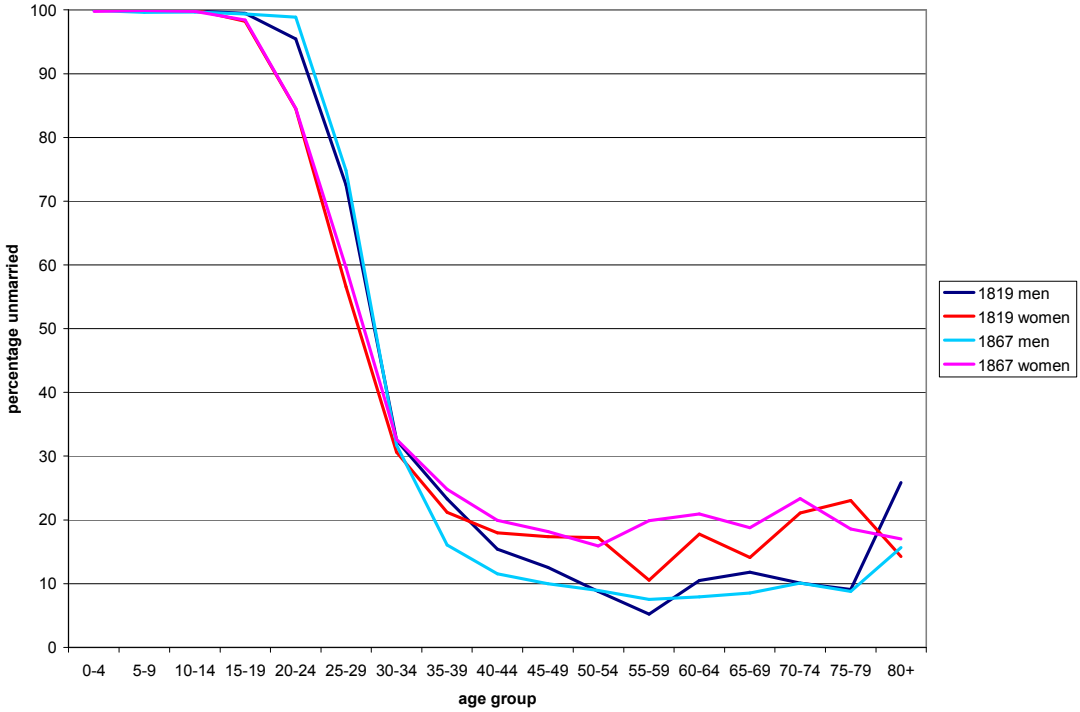
Table 2: Household summary characteristics

YEAR	Total households		Total population		Mean no of offspring per household	% relatives in the population	Mean no of relatives per household
	Incl. type 6	Excl. type 6	Incl. type 6	Excl. type 6			
1819	3601	3595	15460	15390	1.50	2.15	0.09
1867	6826	6770	29094	28511	1.49	3.40	0.14

Table 3: Summary characteristic of household composition

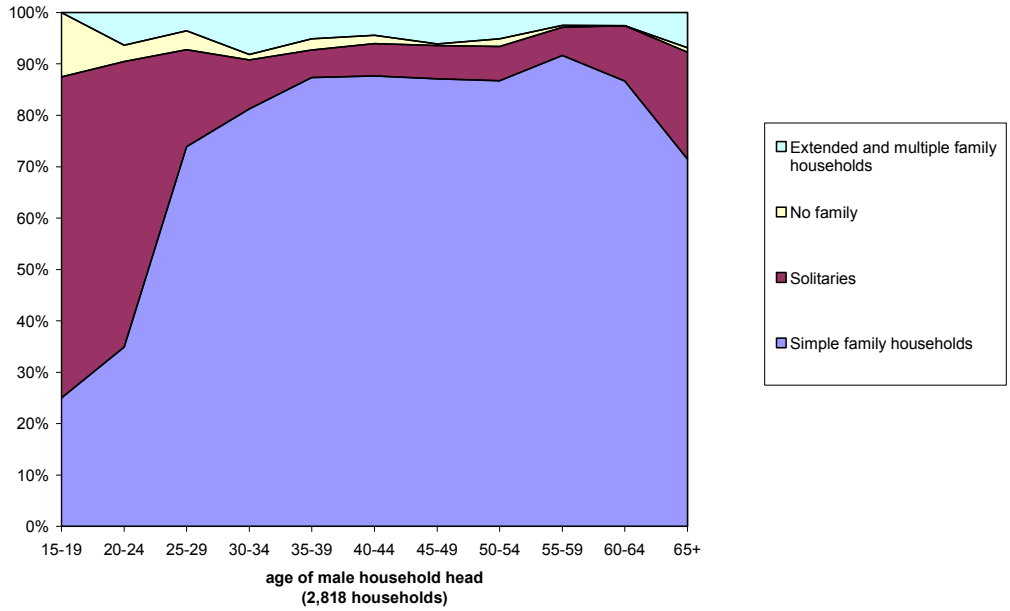
CENSUS YEAR			1819	1867
Total population excluding hhs type 6			15390	28511
% servants in tot pop		freq.	2600	4042
		%	16.89	14.18
% relatives in tot pop	Parents	freq.	67	219
		%	0.44	0.77
	Siblings and other lateral kin	freq.	124	429
		%	0.81	1.5
	Other kin	freq.	90	200
		%	0.58	0.7
	Total relatives in the population	freq.	331	968
		%	2.15	3.4
% non-kin in tot pop	Lodgers	freq.	571	1027
		%	3.71	3.6
	Other non-kin (non-servants)	freq.	526	1107
		%	3.43	3.88
	Total non-kin in the population	freq.	1097	2134
		%	7.14	7.48

Figure 1: Percentage of unmarried people by age groups



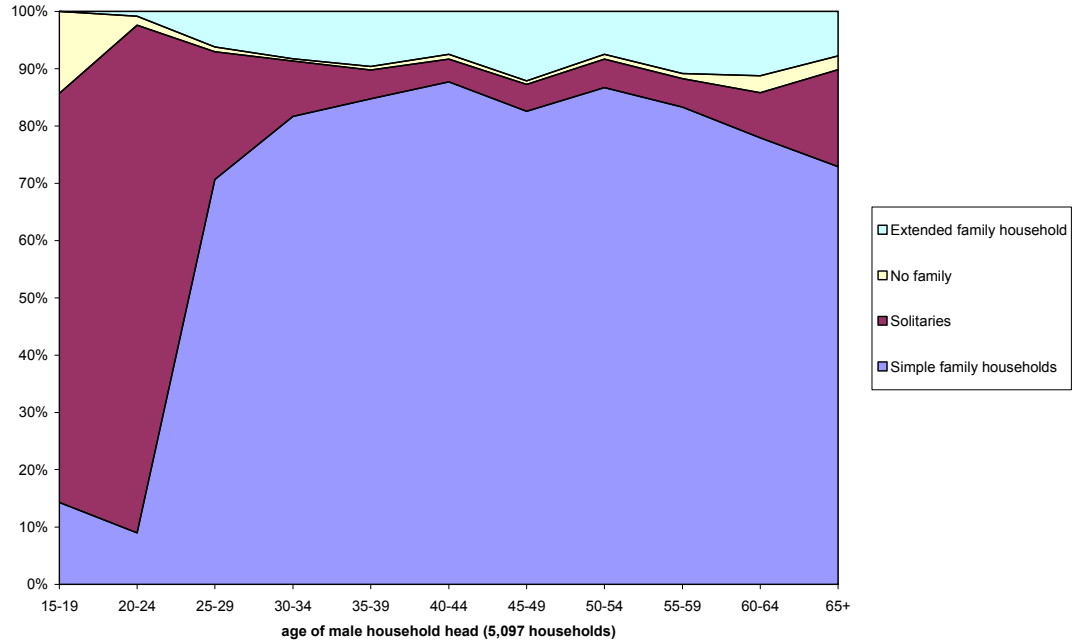
Note: Households of type 6 are excluded.

Figure 2: Household typology by age of male household head, 1819



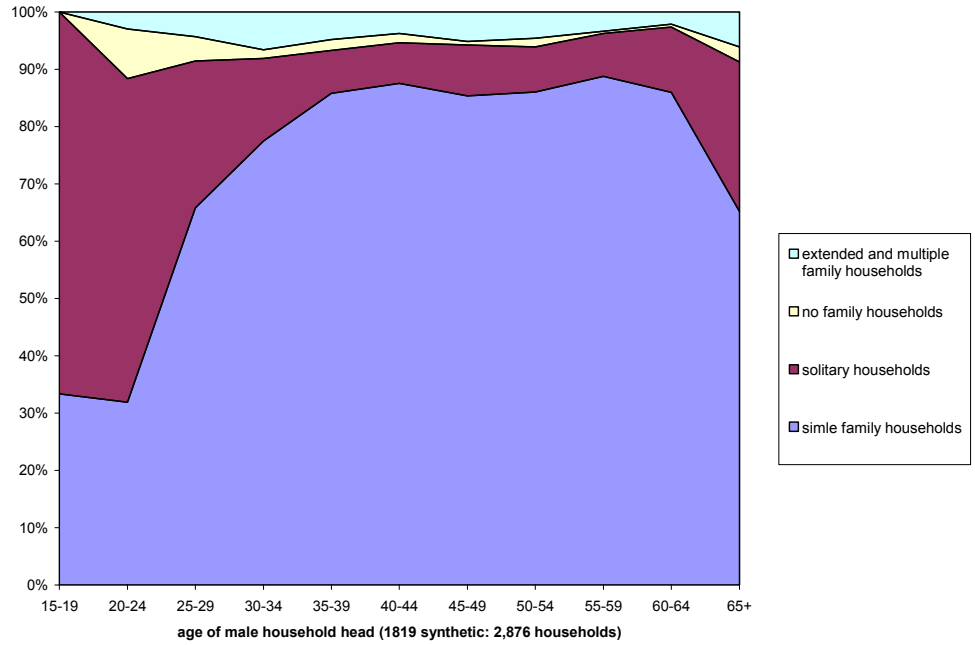
Note: Households of type 6 are excluded.

Figure 3: Household typology by age of male household head, 1867



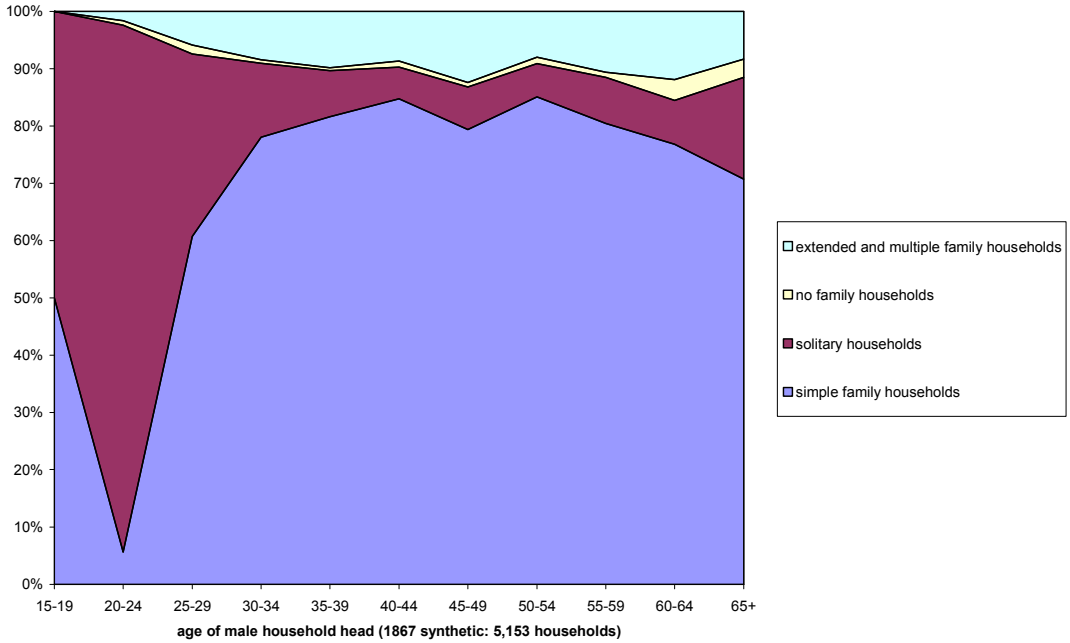
Note: Households of type 6 are excluded.

Figure 4: Household typology by age of male household head, 1819 synthetic



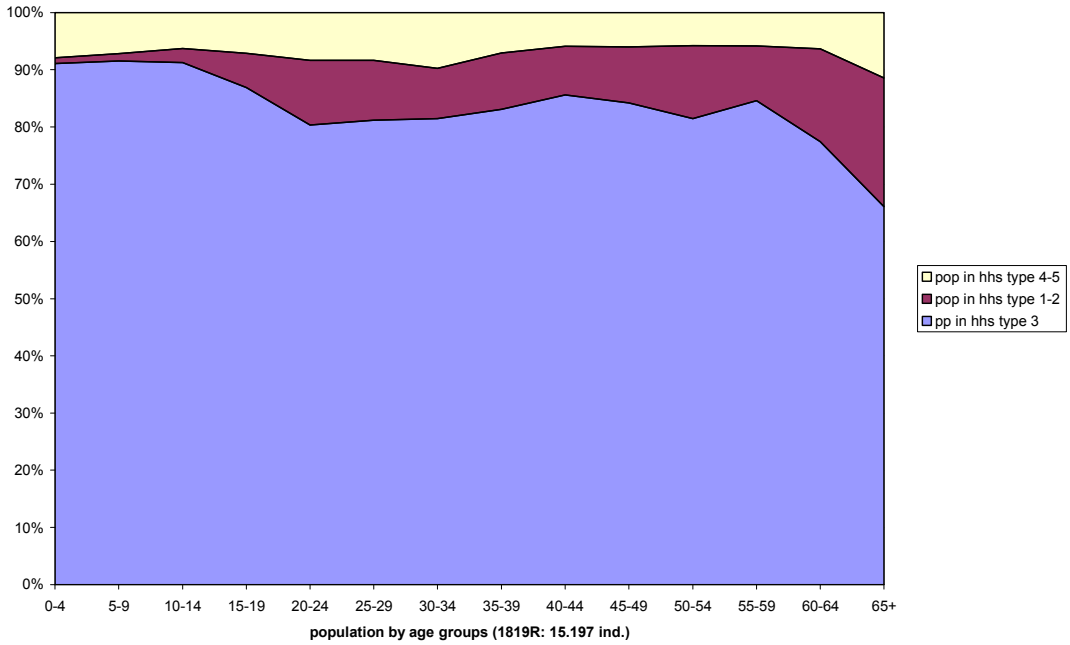
Note: Households of type 6 are excluded.

Figure 5: Household typology by age of male household head, 1867 synthetic



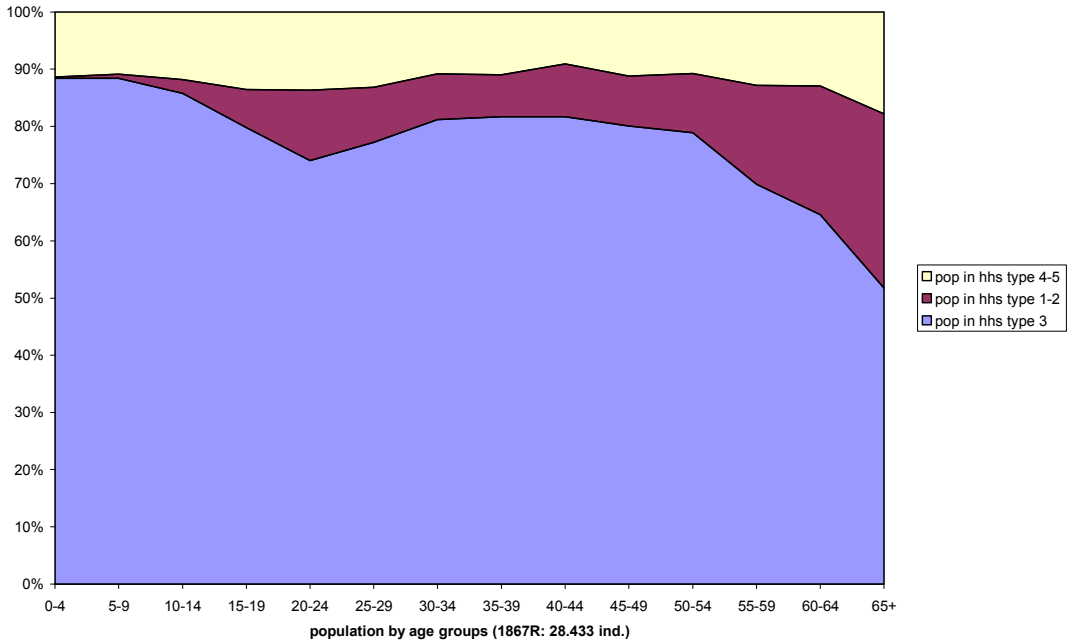
Note: Households of type 6 are excluded.

Figure 6: Household type membership by age, 1819



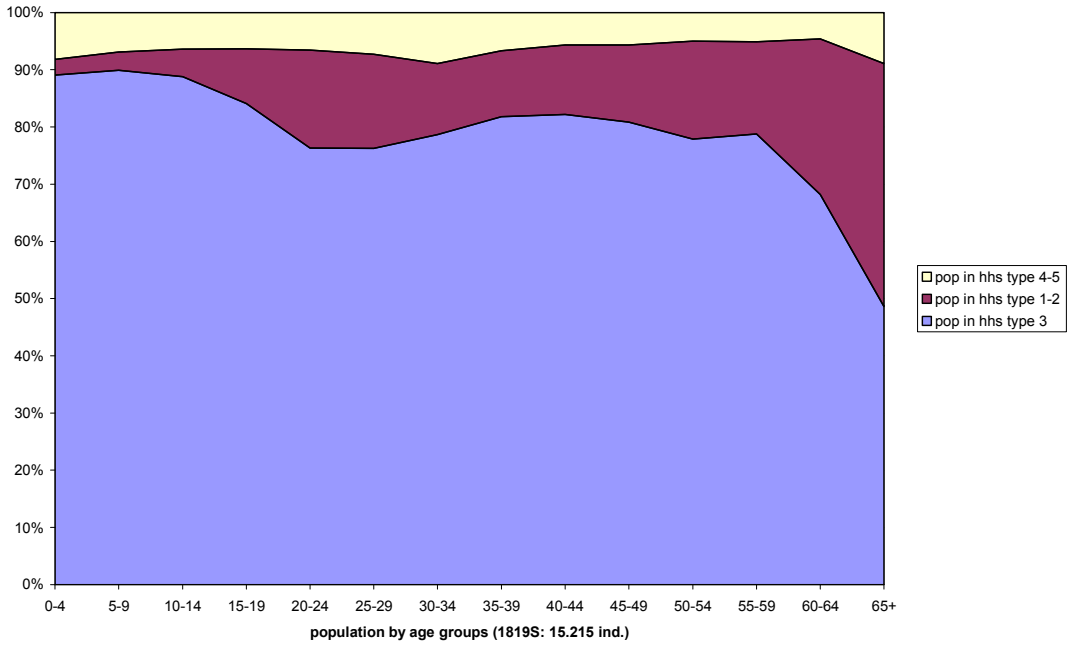
Note: Households of type 6 are excluded.

Figure 7: Household type membership by age, 1867



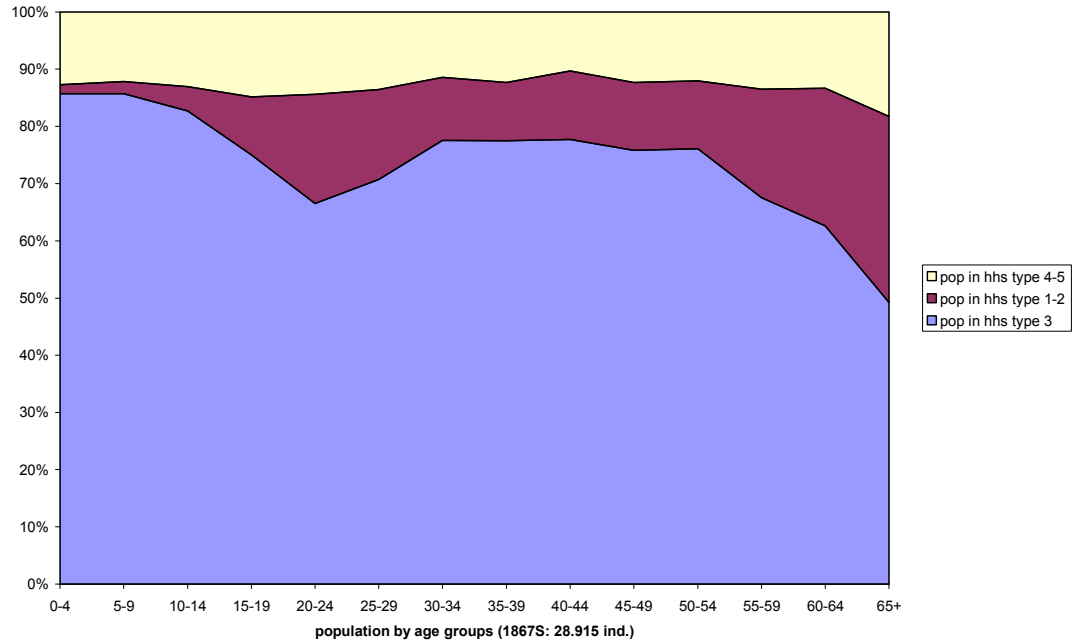
Note: Households of type 6 are excluded.

Figure 8: Household type membership by age, 1819 synthetic



Note: Households of type 6 are excluded.

Figure 9: Household type membership by age, 1867 synthetic



Note: Households of type 6 are excluded.

Figure 10: Population by household size groups

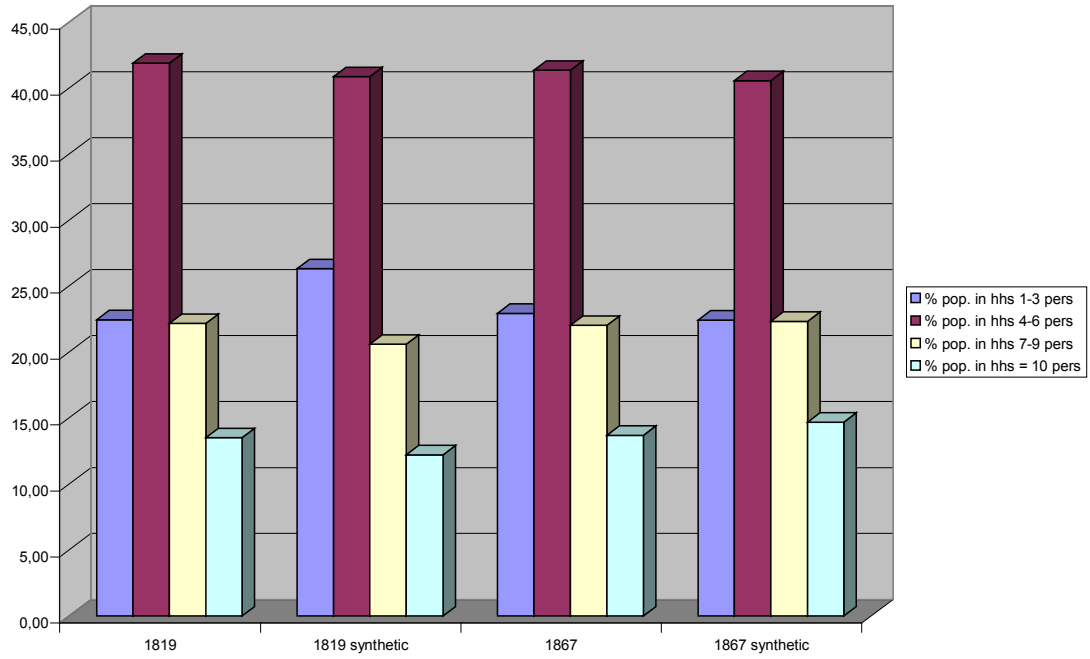


Figure 11: Households by household size groups

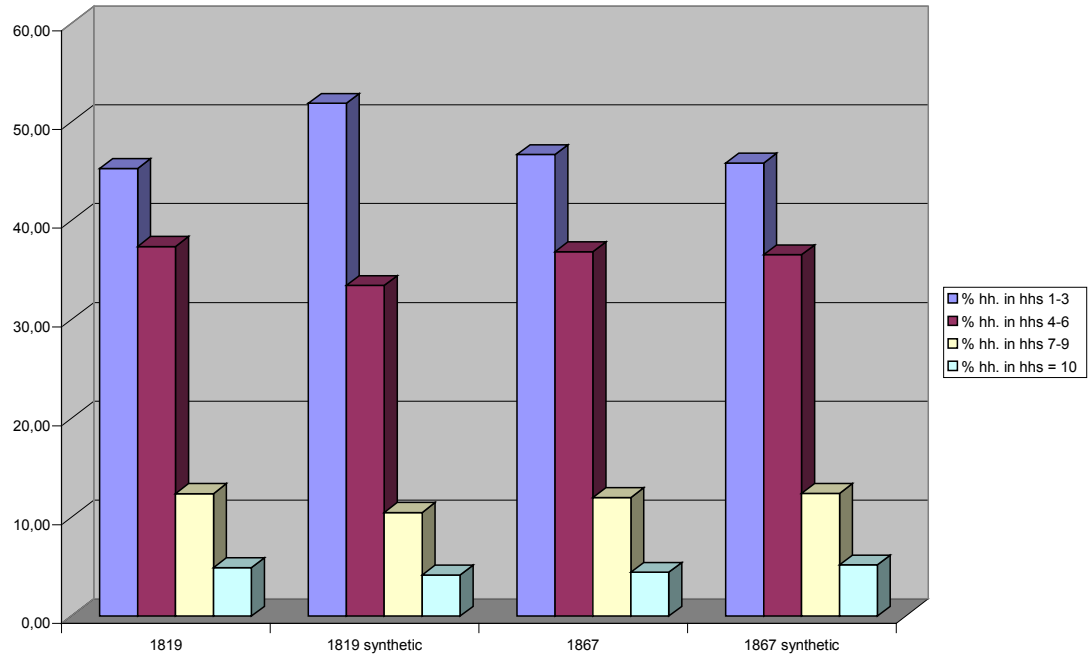
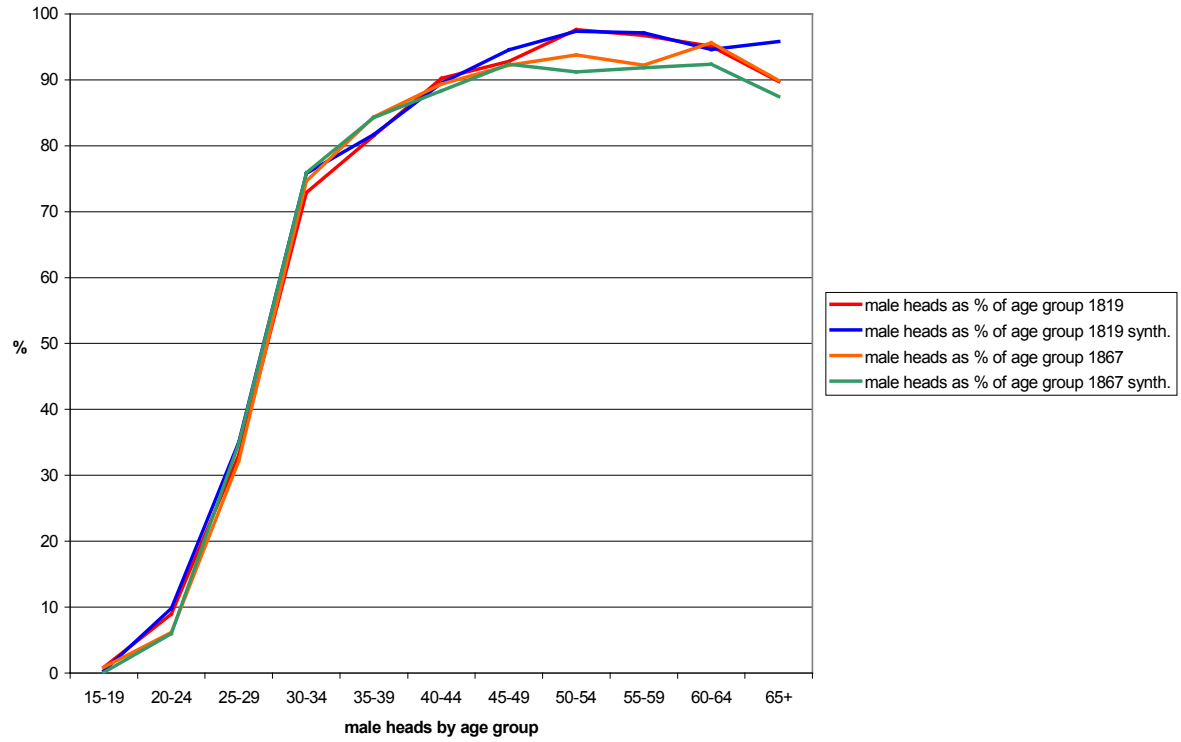
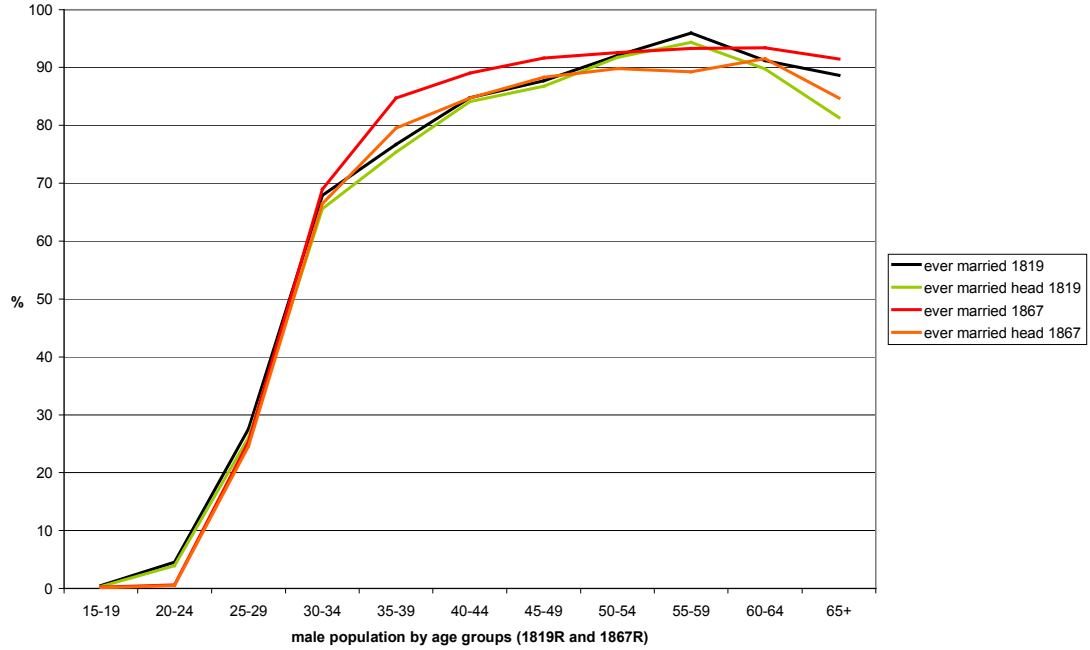


Figure 12: Headship rates of men



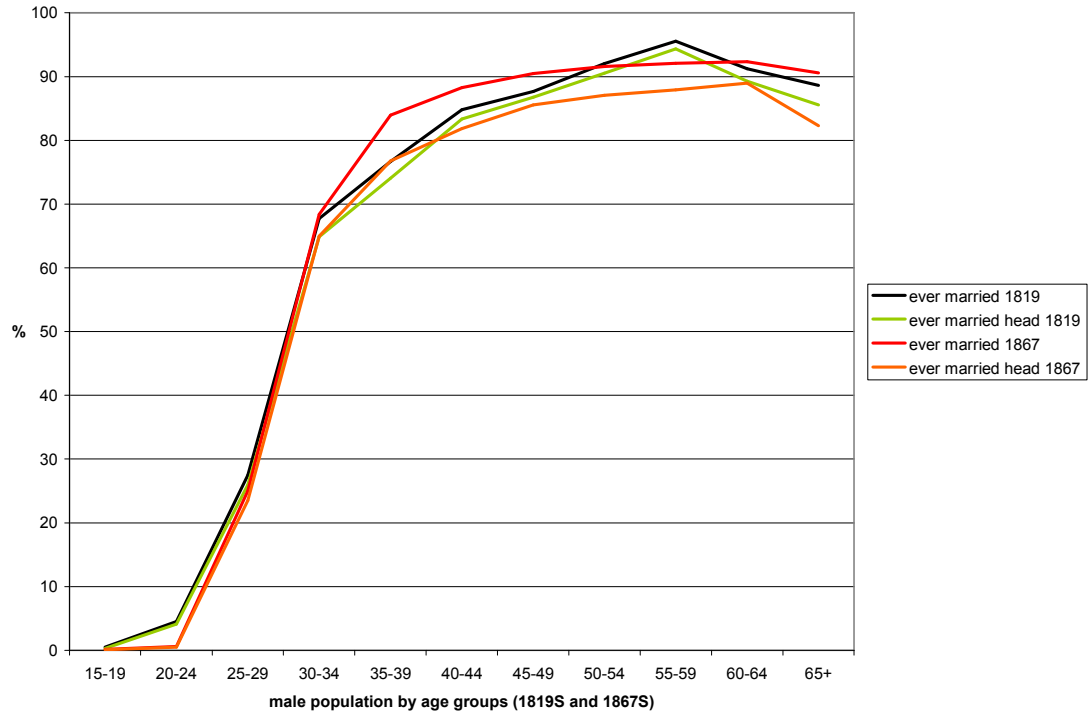
Note: Households of type 6 are excluded.

Figure 13: Entry into marriage and into headship: males in Rostock 1819 and 1867 (real)



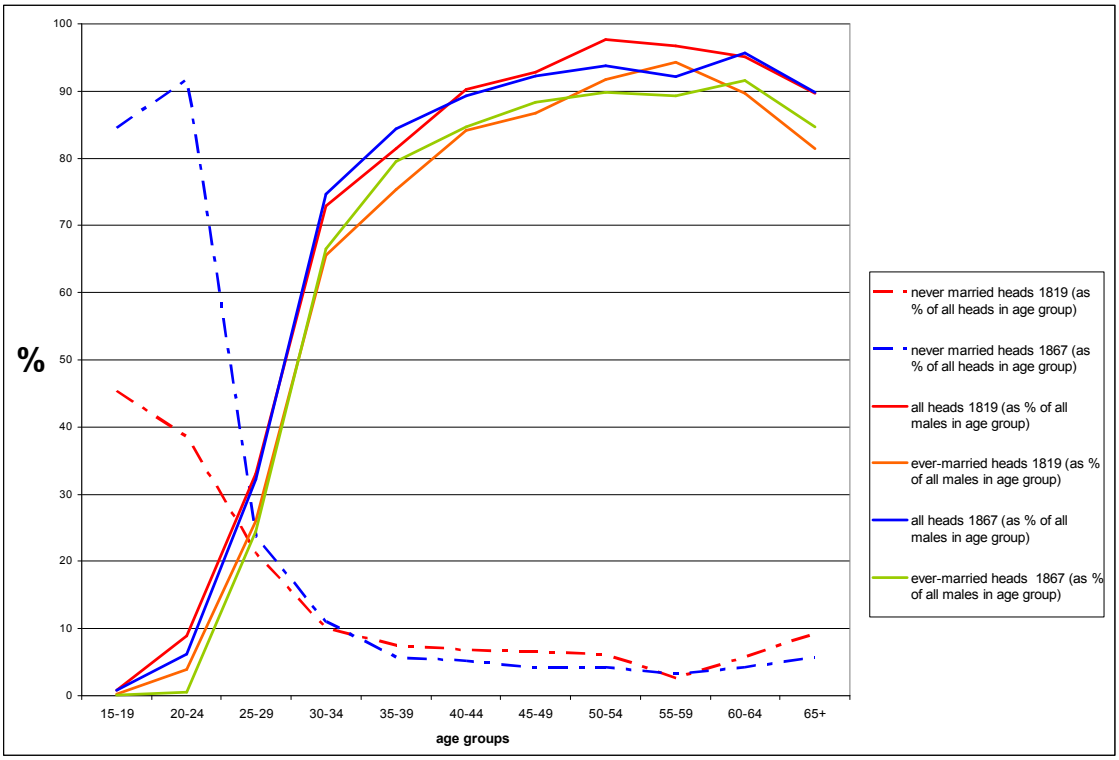
Note: Households of type 6 are excluded.

Figure 14: Entry into marriage and into headship: males in Rostock 1819 and 1867, synthetic files



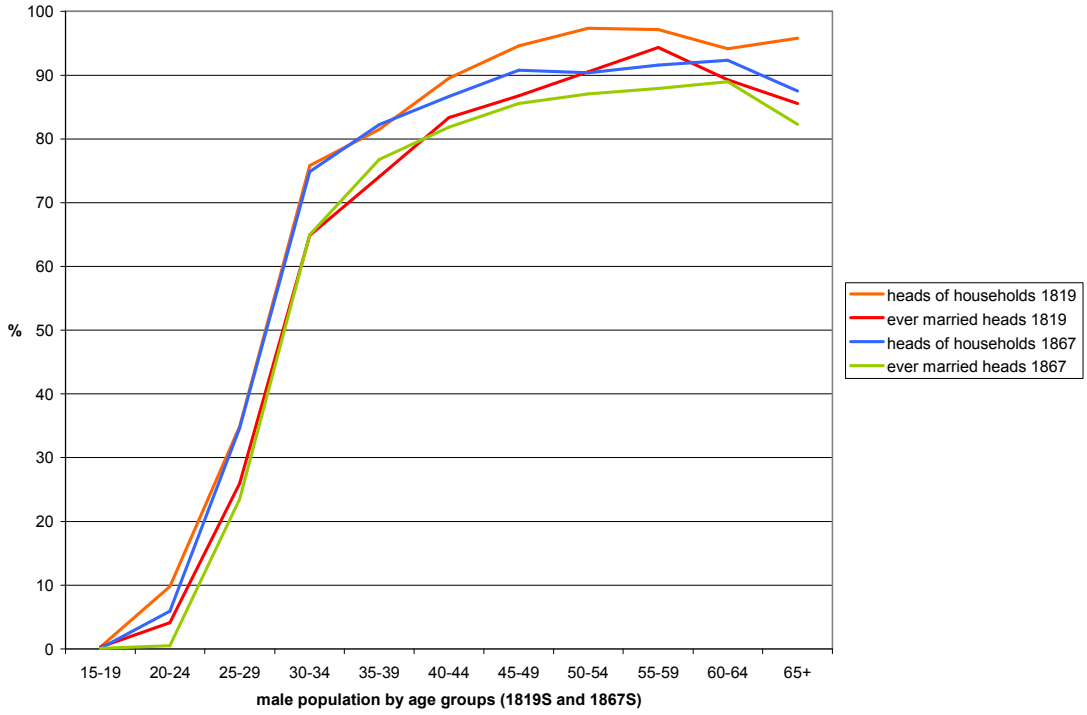
Note: Households of type 6 are excluded.

Figure 15: Headship rates, ever- and never-married household heads, men by age groups (real)



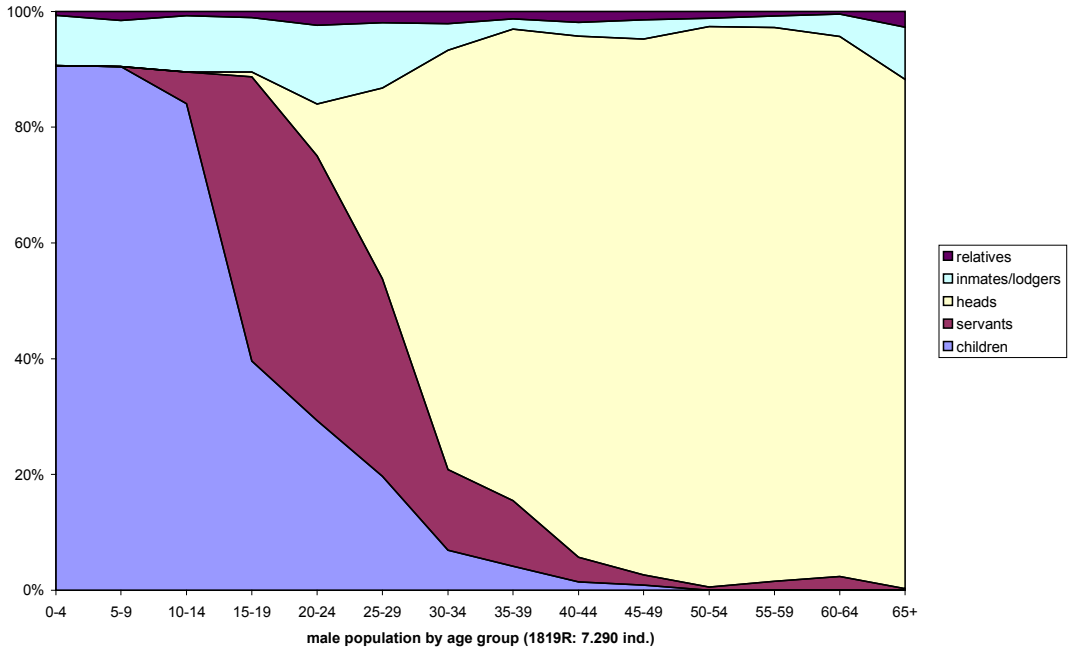
Note: Households of type 6 are excluded

Figure 16: Headship rates and ever married household heads, men by age groups, synthetic files



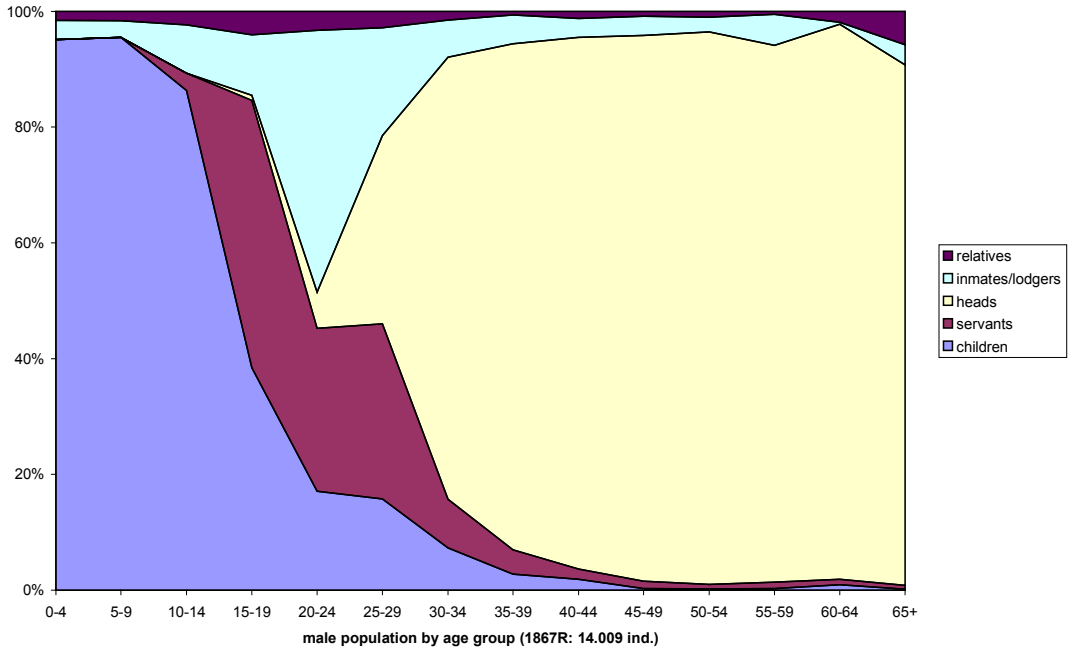
Note: Households of type 6 are excluded.

Figure 17: Relationship to the household head by age groups, men 1819



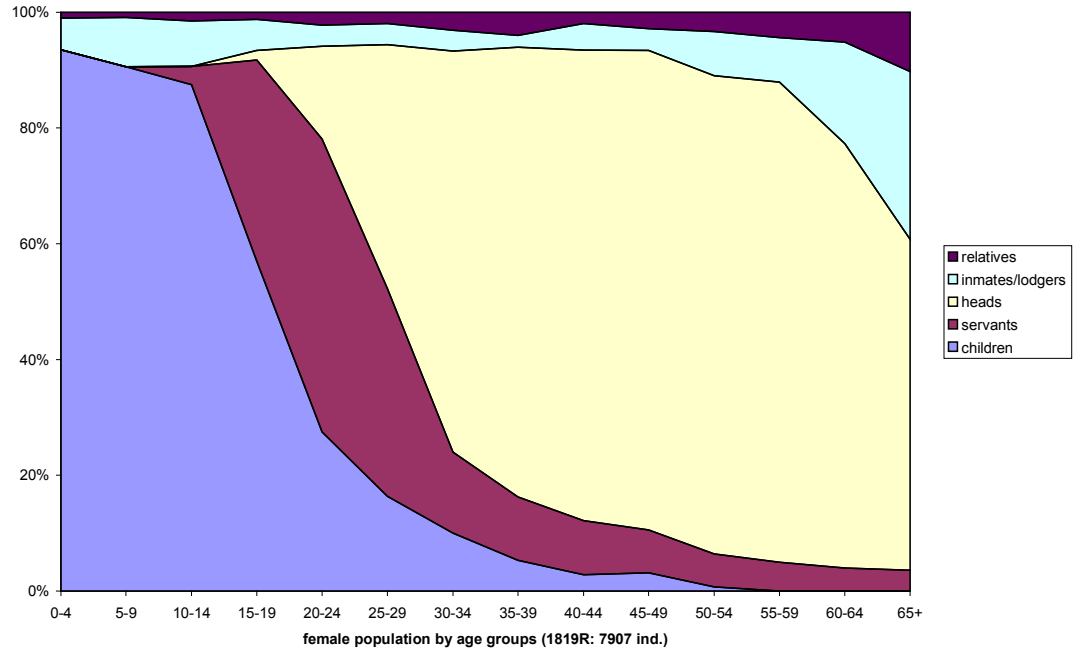
Note: Households of type 6 are excluded.

Figure 18: Relationship to the household head by age groups, men 1867



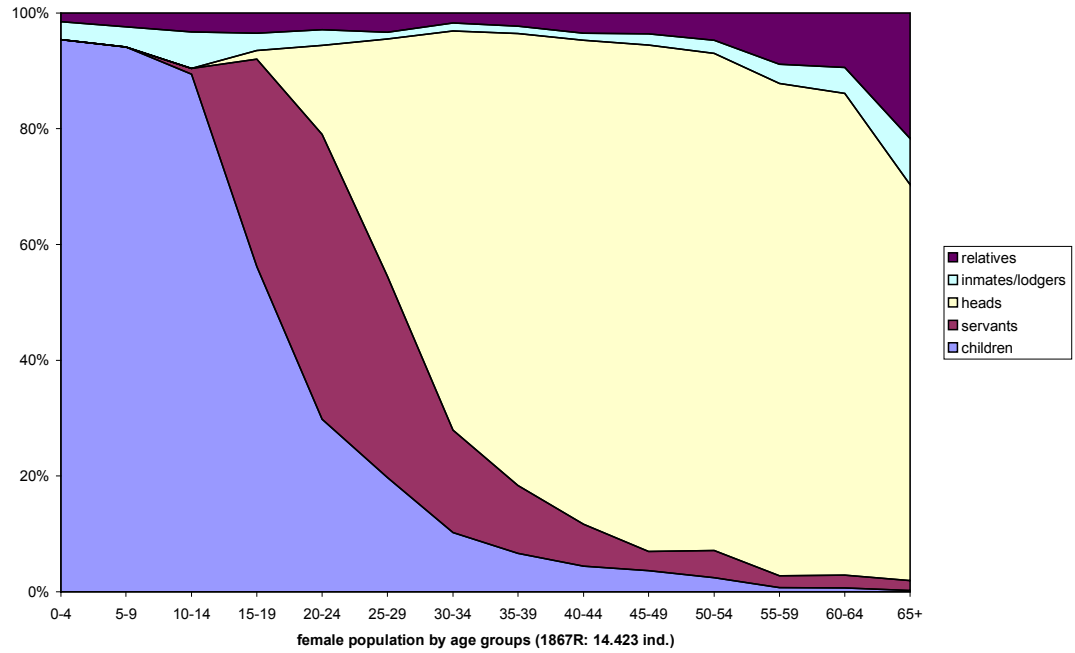
Note: Households of type 6 are excluded.

Figure 19: Relationship to the household head by age groups, women 1819



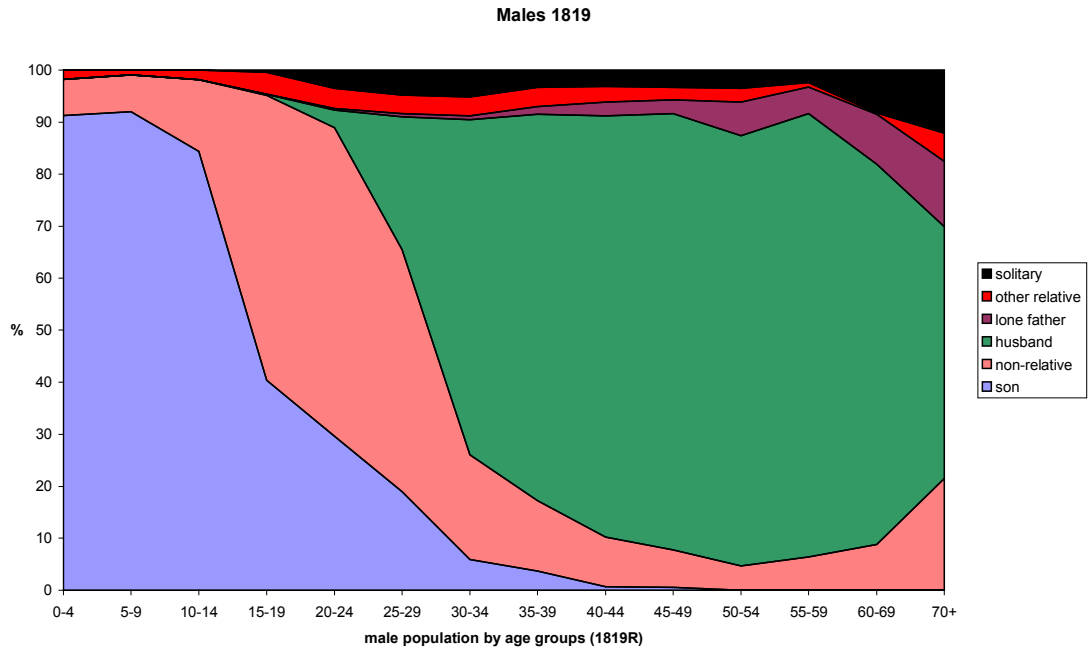
Note: Households of type 6 are excluded.

Figure 20: Relationship to the household head by age groups, women 1867



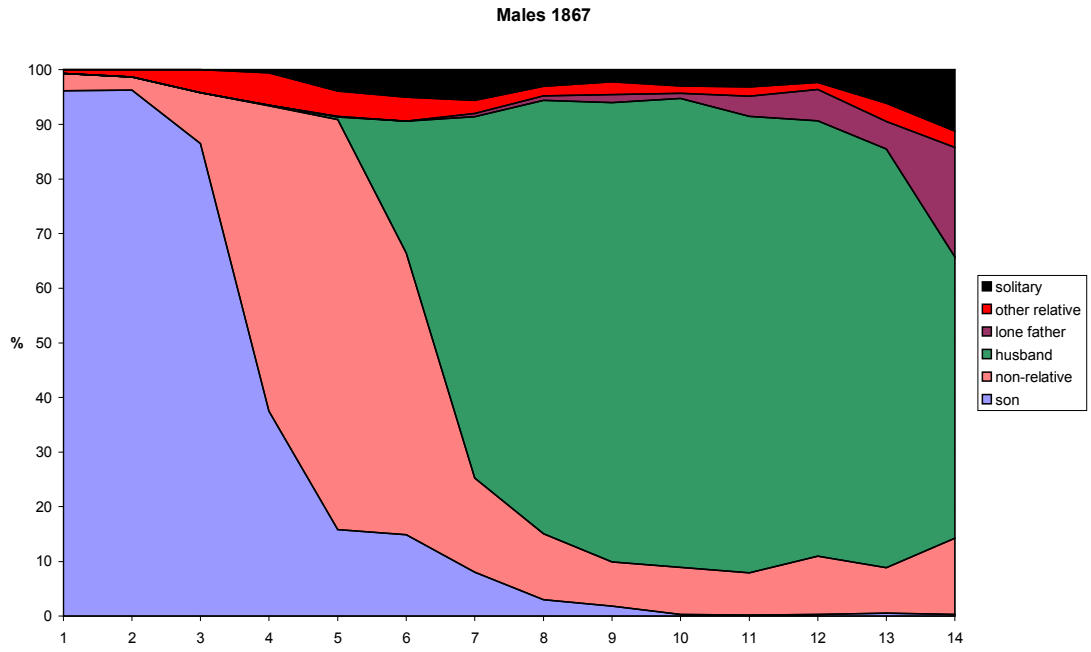
Note: Households of type 6 are excluded.

Figure 21: Relationship to other members of the household by age groups, males 1819



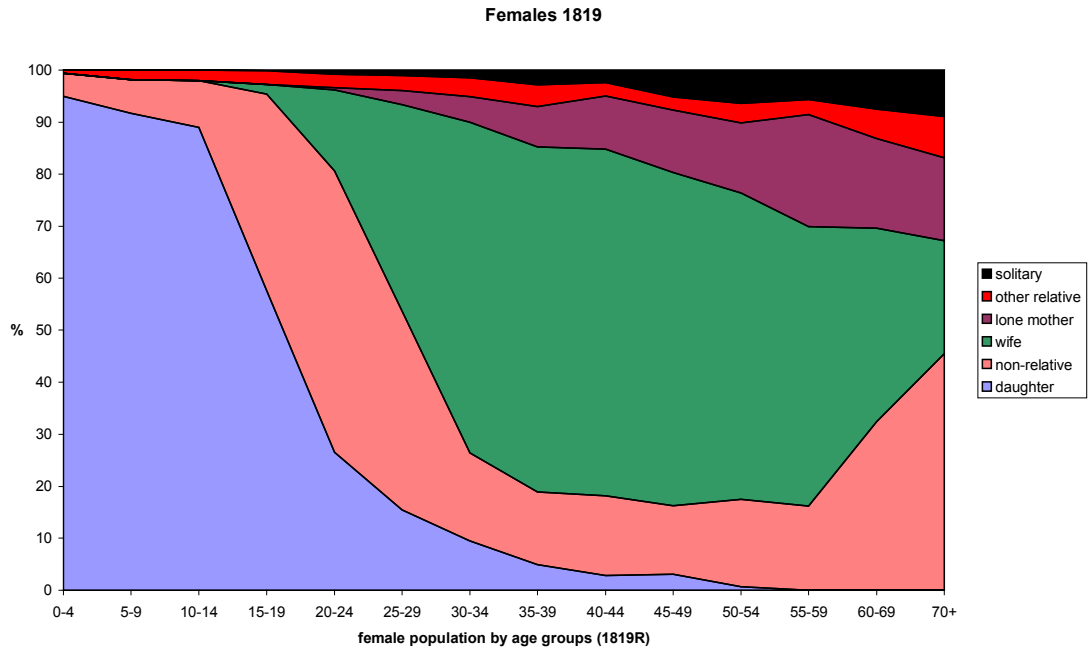
Note: Households of type 6 are excluded.

Figure 22: Relationship to other members of the household by age groups, males 1867



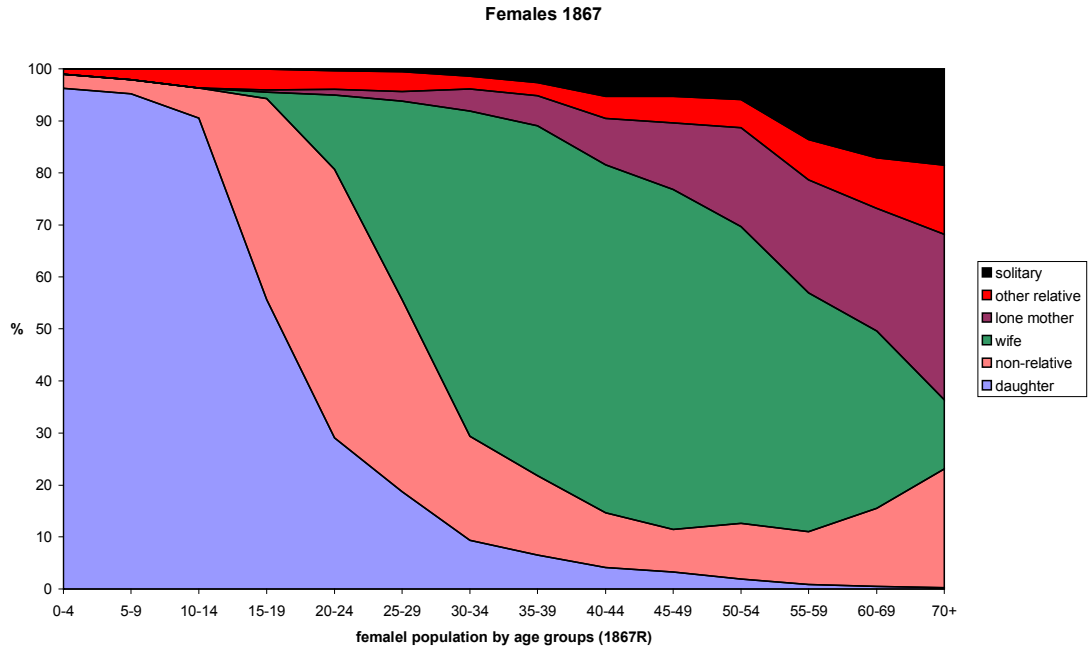
Note: Households of type 6 are excluded.

Figure 23: Relationship to other members of the household by age groups, females 1819



Note: Households of type 6 are excluded.

Figure 24: Relationship to other members of the household by age groups, females 1867



Note: Households of type 6 are excluded.

Figure 25: Living with the own father by age group

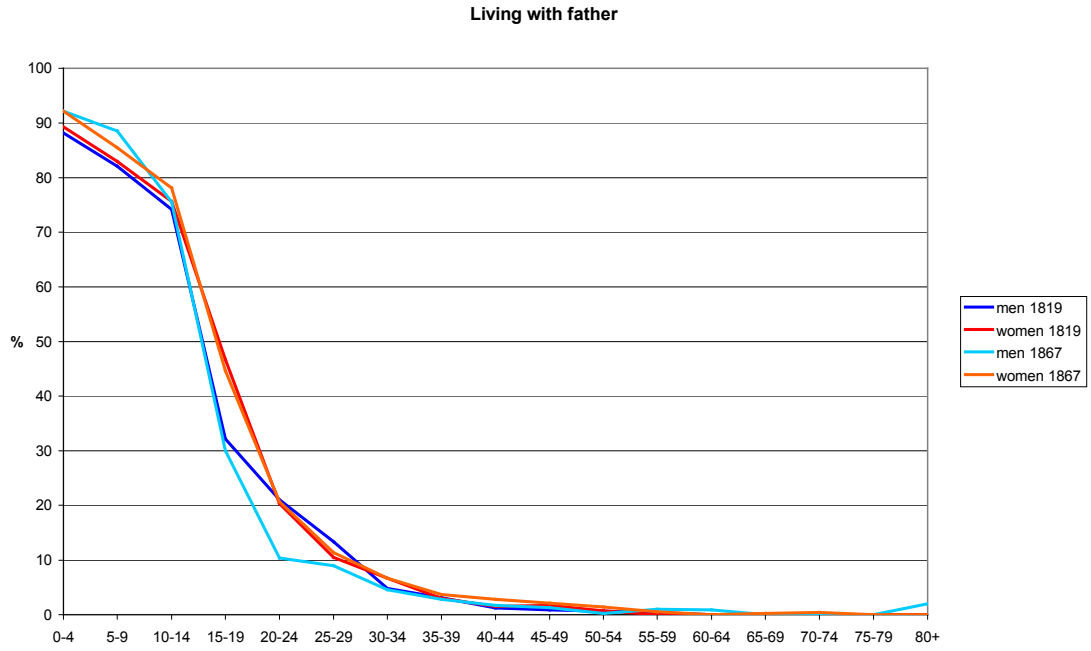


Figure 26: Living with the own mother by age group

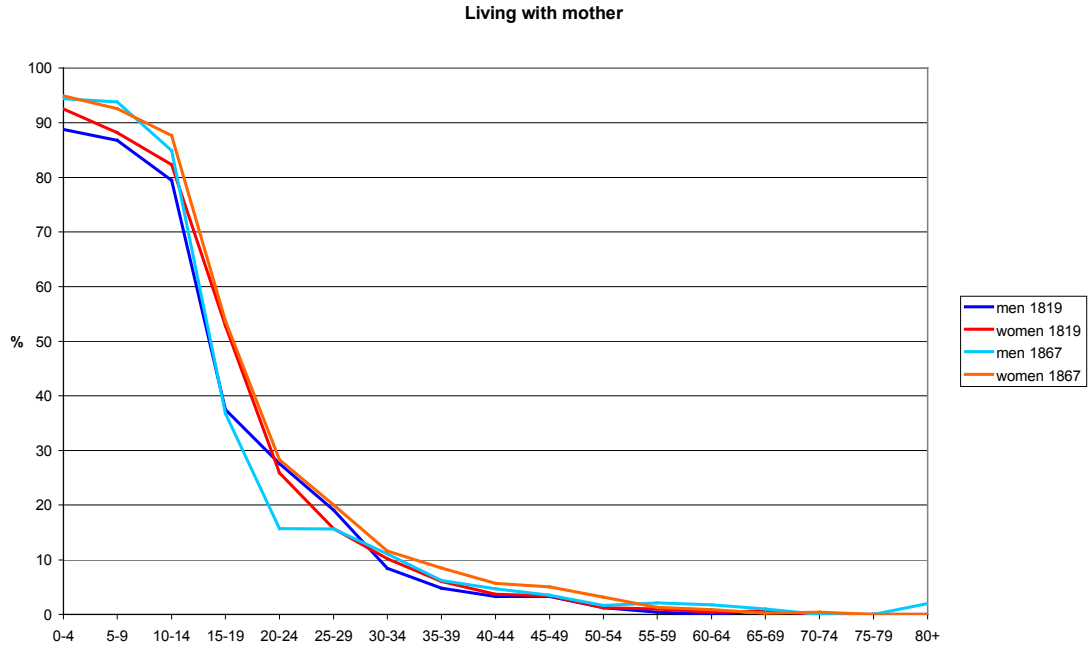


Figure 27: Living with an own child by age group

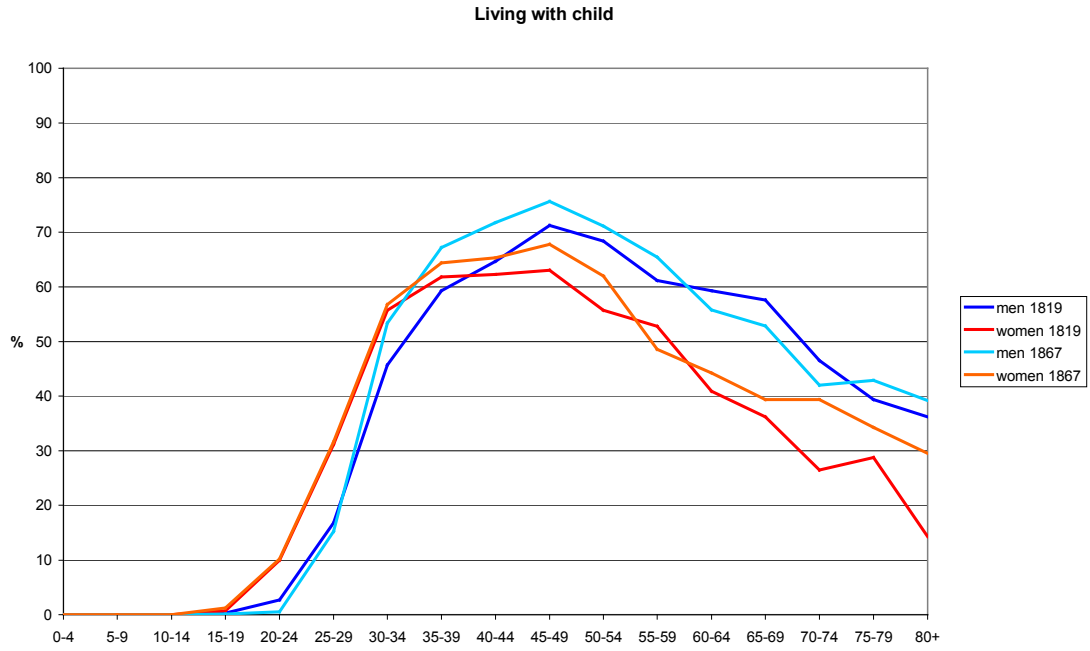
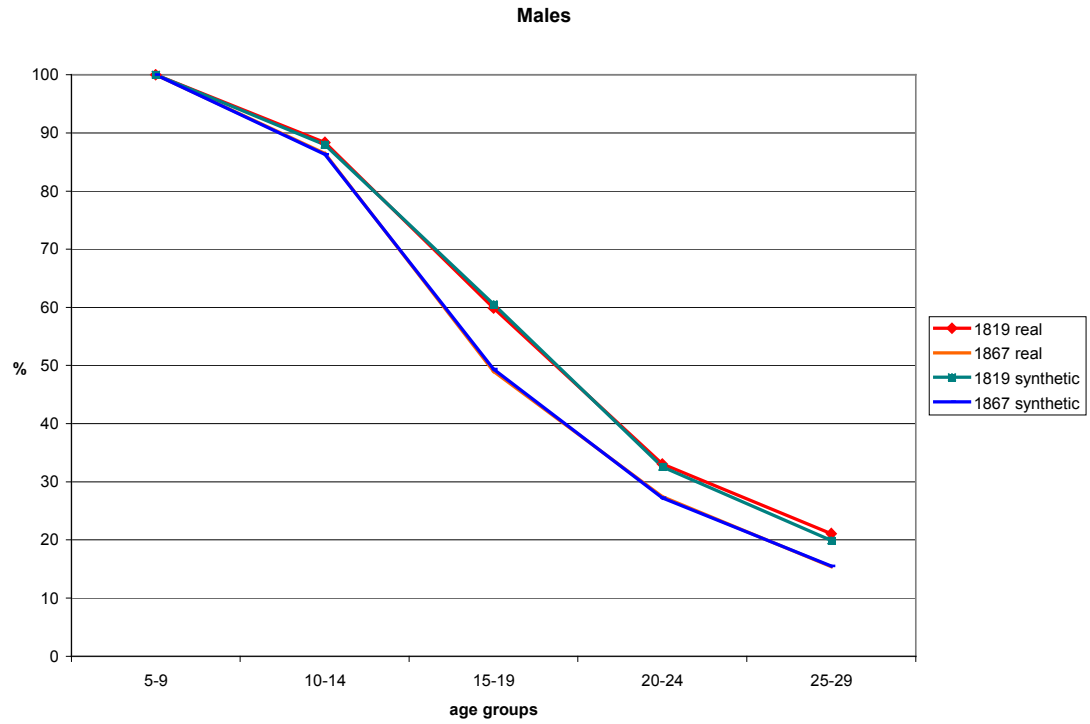
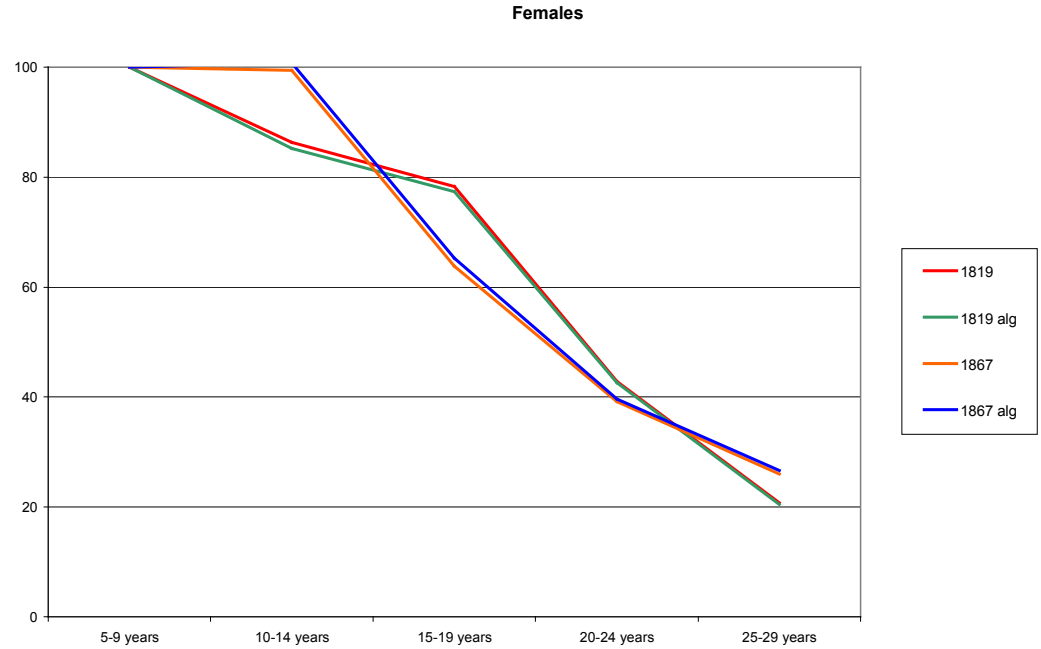


Figure 28: Proportions of men still living at home by age groups



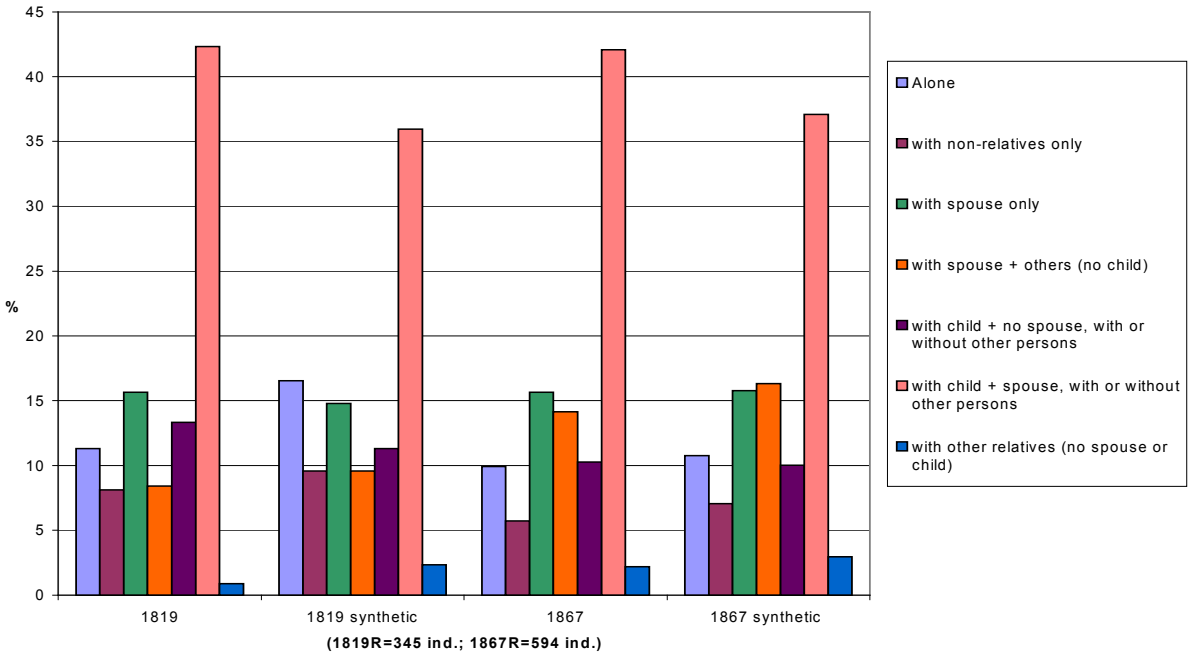
Note: Households of type 6 are excluded.

Figure 29: Proportions of women still living at home by age groups



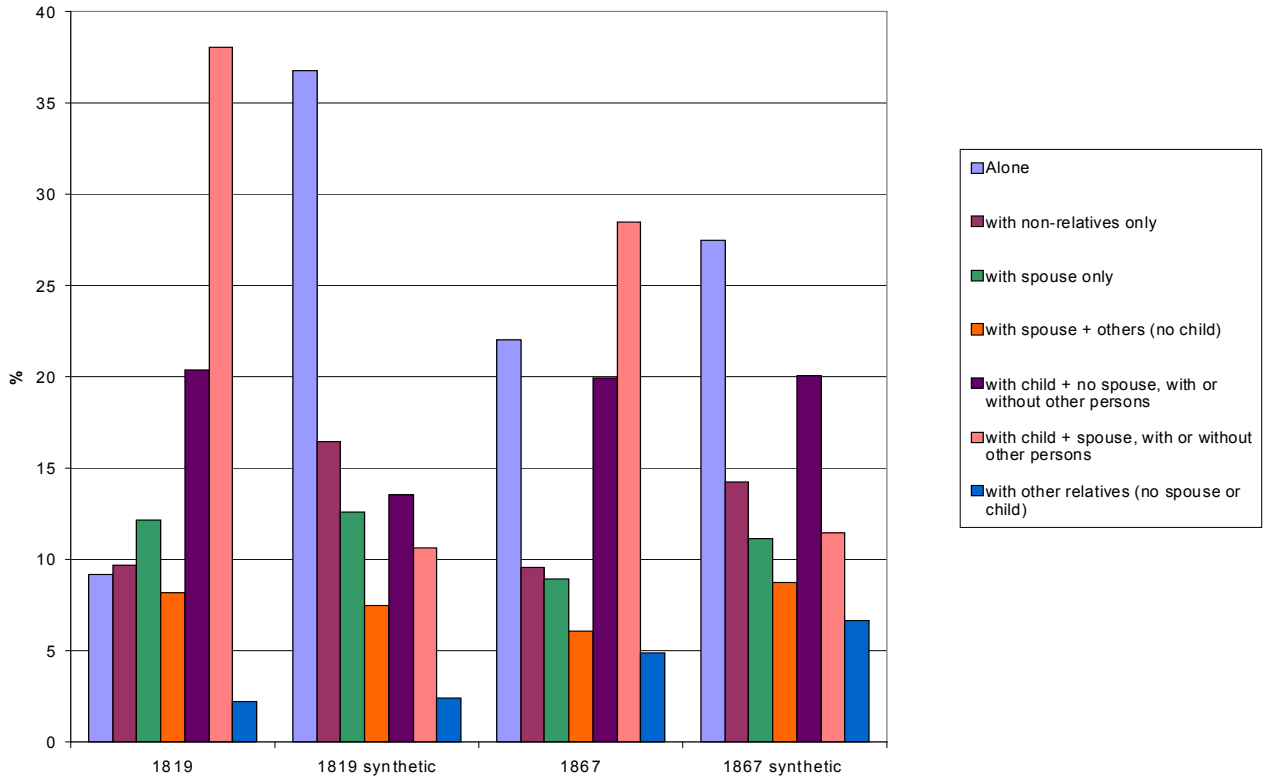
Note: Households of type 6 are excluded.

Figure 30: Residential patterns of men aged 65+



Note: Household heads or their spouses only.

Figure 31: Residential patterns of women aged 65+



Note: Household heads or their spouses only.

Figure 32: Servants as percentage of population by age groups

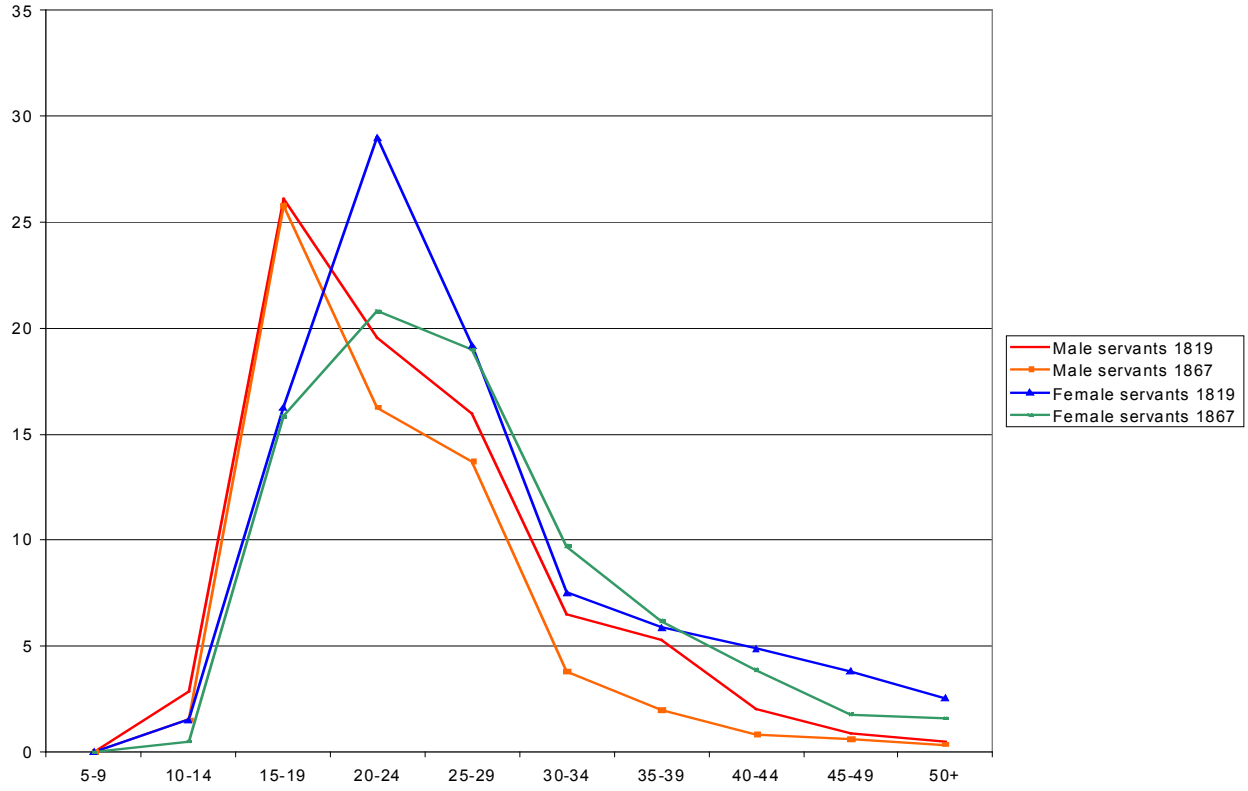


Figure 33: Distribution of servants by age groups

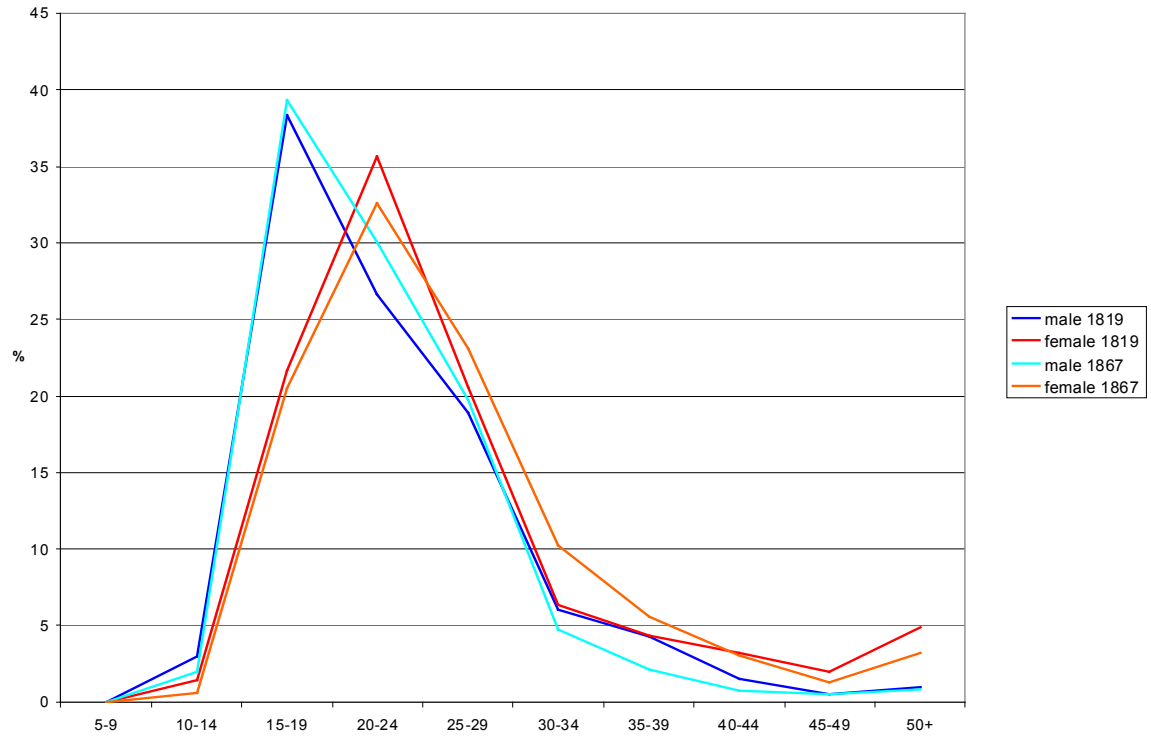
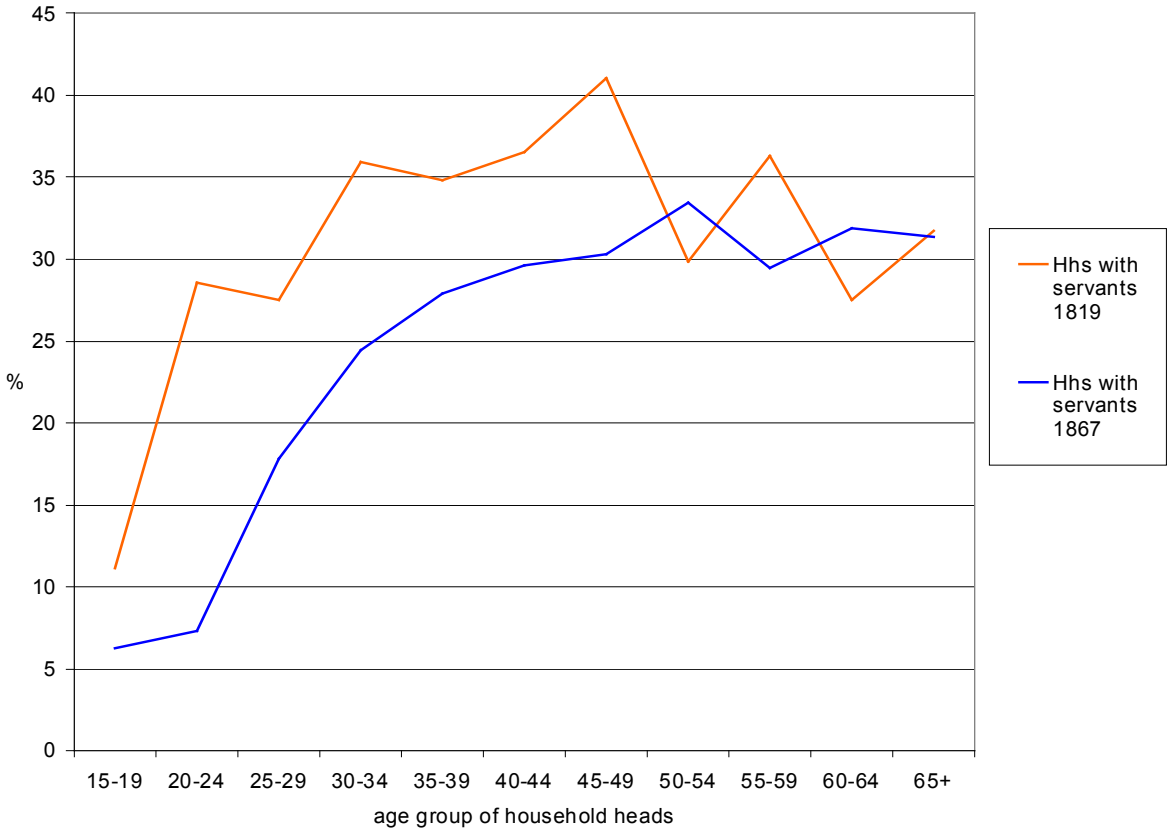
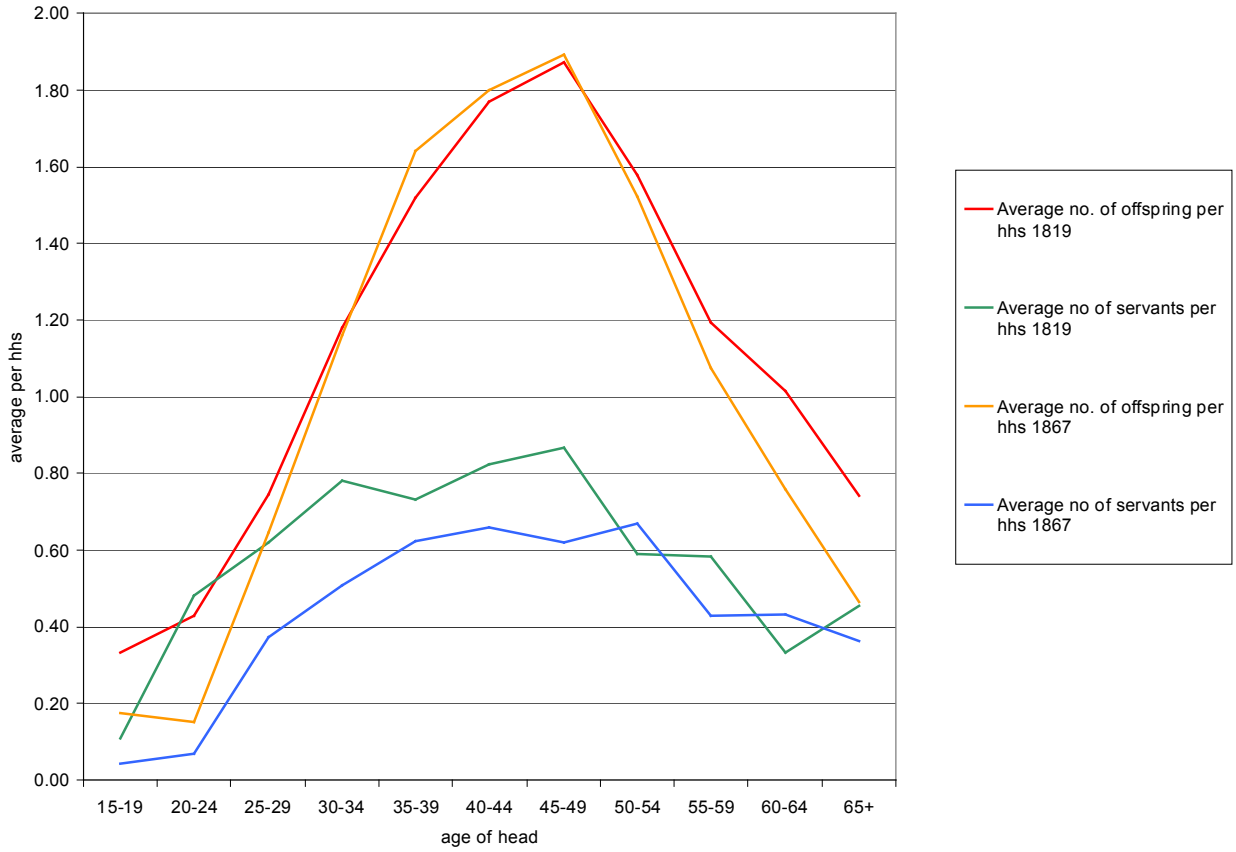


Figure 34: Proportion of households with servants by age of household heads



Note: Households of type 6 are excluded.

Figure 35: Number of offspring and servants by age of household head



Note: Households of type 6 are excluded.