



HUMAN EVOLUTIONARY DEMOGRAPHY

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25. Cooperation and Competition Begin at Home: Bridging Household Ecology and Human Evolutionary Demography

Julia A. Jennings

Households are the next social unit above the individual and are home to shared activities that can include resource production, distribution and transmission in addition to reproduction and co-residence. They overlap with biological and social kin groups but are defined by activities rather than by relationships alone. This chapter reviews literature from historical and anthropological studies of households with relevance for human evolutionary demography. Selected research on household effects on mortality, fertility, and intra-household conflict across different agricultural societies is presented to familiarize evolutionary demographers with concepts, issues, and findings in the interdisciplinary and comparative literature on the household. Household researchers have drawn upon evolutionary concepts as part of explanatory models but are less likely to test evolutionary hypotheses directly. Evolutionary researchers have focused on familial relationships, but seldom consider power structures within households and the effects of household composition and dynamics on behaviour. Areas with potential for mutually beneficial collaboration between evolutionary and household analysts are highlighted and advocated for. Such collaborations have the potential to advance our understanding of the determinants of demographic behaviour by joining rich data sources with theoretical frameworks drawn from evolutionary and household perspectives.

Introduction

The household is an important unit of social and behavioural analysis as it is the context in which essential decisions are made and activities are carried out including production, consumption, and social and biological reproduction. This chapter aims to draw the attention of researchers in evolutionary social science to concepts and issues in household research relevant to human evolutionary demography. Households overlap with, yet are distinct from, family and kin. While kin are studied in a diverse range of evolutionary analyses, especially those that draw upon Hamilton's inclusive fitness (1964a; 1964b), households are considered less systematically even while the datasets used by many evolutionary demographers comes from collection methods driven by household concepts including censuses, household registers, and household surveys.

The literature on household analysis and theory has been informed by a broad collection of disciplines, including anthropology, sociology, economics, demography, and history, especially historical demography. These fields have contributed to household definitions, cross-cultural comparisons of household composition and structure, analyses of household change over time, and descriptions of the social, cultural, and economic forces that affect and are affected by household formation and dissolution, household activities, and the roster of household members. There is potential for productive dialogue and collaborative efforts among researchers interested in human evolutionary demography and households. The opportunities and constraints on individual actions that are shaped by households may be overlooked in individual- or family-level analyses, so it is important for evolutionary analysts to consider the effects of these domestic contexts. Household researchers bring rich social, cultural, and historical understandings of the household to bear in their research, and evolutionary perspectives can assist their efforts to make cross-cultural comparisons and understand household effects on outcomes and behaviours, such as those tied to survival and reproduction. It is time for concerted efforts to bridge across these scholarly traditions to integrate households carefully and explicitly in the analysis and interpretation of human evolutionary demography.

While some have speculated on the evolutionary origins of human households (Quiatt and others 1985; Quiatt and Kelso 1987) or whether certain household forms have some basis in biology or human evolutionary history (Smith 1993), these are not the aims of this chapter. Instead, I wish to argue for the importance of household settings and dynamics in shaping behaviours of interest to human evolutionary demographers. More specifically, this chapter illustrates cases where predictions drawn from evolutionary theory may or may not align with results from analyses of mortality and fertility that include household-level variables or studies of intra-household processes and dynamics. This discussion is limited to literature and data from agricultural communities, especially those that practice traditional or preindustrial agriculture. There is a wealth of research from historical demographic and anthropological studies of agricultural societies, much of which includes longitudinal data and detailed cultural, economic, and historical contextual information to allow for comparative analysis and the investigation of household dynamics and change over time. Further, many household analyses of historical and anthropological agricultural populations may not be familiar to evolutionary researchers as much of this research does not draw explicitly from evolutionary theory, even if there is overlapping interest in the underlying behaviours or outcomes. In addition, household activities may look rather different across different economic systems. For example, co-residence may operate differently in foraging groups than in farming groups. The focus on one economic system reduces some of this comparative complexity for the purpose of this chapter.

Background: Households as a Unit of Analysis

Households are a fundamental social unit in human societies and are considered the first level of aggregation above the individual by some analysts (Hammel 1984). In several disciplines, including anthropology, sociology, and economics, households are considered an essential element of social and economic organization. Households are the context in which many demographic activities and related decisions occur. The household concept is commonly distinguished from family or kin through a focus on patterns of activity rather than on biological and social relatedness, although household and family typically overlap to some degree. For

example, some kin may co-reside within the same household while other kin may reside in separate independent households. Household activities include some combination of resource production, distribution and transmission; biological and social reproduction; and co-residence. Despite the ubiquity of households, settling on a single, cross-culturally appropriate definition has proven difficult. Some prefer definitions that emphasize co-residence (Laslett and Wall 1974; Verdon 1998), while others stress genealogical relationships (Hammel and Laslett 1974), collaborative work and other tasks (Carter 1984; Laslett 1983), or control of property (Gray and Gulliver 1964). Households change over time as members enter, exit, and grow older, and this complicates attempts at definition even further (Keilman and others 1988; Carter 1984; van de Walle 2016; Murphy 1996). To address the fluid nature of households in statistical analyses, some analysts treat households as contexts through which focal individuals pass during the life course (Ruggles 2009; Ruggles and Brower 2003; Hareven 1974). In demographic literature, the household concept is often driven by the definitions developed for census enumerations and survey instruments, which may not accurately represent the complex social realities in which people live and carry out activities (Kriel and others 2014; Randall and others 2011). For instance, census enumerations are designed to reduce double counting and therefore must assign individuals to only one household even if they consider themselves to be part of more than one household.

For the purposes of this chapter, I adopt the household concept of overlapping spheres of densely shared activities put forth by Wilk and Netting (1984). Households are groups of individuals that share a combination of production, distribution, transmission, reproduction, and co-residence activities. It is essential to note that the specific details of a Venn diagram describing the set of overlapping activities characteristic of households varies within and between societies and is subject to change over time. This definition of the household focuses on what these social groups do, rather than what they look like (household composition or morphology) or their symbolic or cognitive meanings. These aspects of the household are important, but for this discussion, I choose a definition that is flexible, applicable across a broad range of societies, and encompasses matters of interest to evolutionary and demographic analysts such as resource acquisition, resource distribution and consumption, and social and biological reproduction.

Household characteristics, including size and composition, are affected by demographic processes. Individuals may enter a household through birth, marriage, or migration and exit a household by death, marriage, or migration. Demographic models of the household often use microsimulation to understand how different age-specific rates of fertility and mortality, the timing of events such as marriage or first reproduction, and practices associated with post-marital residence, affect households (Burch 1970; Wachter 1987; Dyke 1981). These computational models assume sets of fertility and mortality rates and rules about marriage and co-residence to explore the effects of different demographic regimes and varying types of norms and customs concerning household formation and dissolution on measures of household composition, such as the frequency of three-generation households. While demographic events shape household size and composition, there is evidence for feedback between demographic events and households, such that household characteristics also affect the risk of demographic events, some of which are described below. Households in this sense are more than a collection of individuals, and there exists a complex web of interactions among

individuals, their household contexts, and demographic events. Households can be considered a “knot of individual interests” (Laslett 1984), and decisions with consequences for fertility, mortality, migration, and marriage are made within the context of this sometimes collaborative and sometimes competitive group. Households, then, may have emergent properties, making them more than the sum of their parts (Netting and others 1984; Cobb 2017; Anderson and others 1994).

Household Contexts and Demographic Behaviour

The discussion that follows highlights examples of variation in associations among household characteristics and demographic outcomes that sometimes correspond and sometimes conflict with expectations drawn from evolutionary theory. The examples are taken primarily from historical demographic and anthropological studies of the household, which may occasionally reference evolutionary hypotheses but seldom perform systematic tests of evolutionary predictions. Collaboration between evolutionary and household researchers could contribute to the development of new systematic explanatory frameworks to aid in the analysis of the effects of household traits, such as the presence of certain coresident kin or the role of internal power dynamics and trade-offs, on outcomes of interest to both fields including mortality and fertility.

Mortality

Analysis of living standards in the past can provide insight into how household settings affect the wellbeing and decision-making of their members and the demographic consequences of inability to overcome economic stress. A comparative historical demographic study of populations in Europe and Asia conducted by the Eurasia Population and Family History Project (EAP) used time series of staple grain prices and the timing of demographic events to examine living standards in the eighteenth and nineteenth centuries (Bengtsson and others 2004; Tsuya and others 2010; Lundh and Kurosu 2014). In these innovative studies of micro-level demographic data, living standards were assessed using estimates of demographic responses to short-term fluctuations in food prices. This approach proposes that for households with low standard of living, even relatively minor increases in food prices could not be adequately managed with common household-level fall back mechanisms to smooth consumption, such as drawing down savings, selling assets, borrowing, poor relief, delaying purchases and sending out household members as migrants (Thomas and Leatherman 1990). During times of struggle, failure to smooth consumption affected demographic behaviour, as mortality could increase, fertility could be reduced, and marriages could be postponed. These responses may be seen as a way that household members adapted, or failed to adapt, to constraints both internal and external to the household.

In contrast, for households with relatively high standard of living, food price fluctuations did not affect household budgets to the same degree. Consumption could be smoothed such that the timing of births and deaths were unaffected. Thus, demographic responses to economic stress can provide insight into consumption decisions at the household level. This approach can uncover differential resource distribution within households as it identifies which household members were more likely to be allocated scarce resources in times of stress. For example, exposure to poor health is associated with socioeconomic standing and standard of living, but

it can also affect household economic production in its own right. Among poor households, the illness of a primary productive member can reduce production and drive the household into even more dire economic conditions (Leatherman 1996). When household allocation of increasingly limited resources favours the most productive members, usually adult men, others including children are at higher risk of under nutrition (Longhurst 1984). Findings from this line of research are of interest to evolutionary analysts, as decisions regarding household production, allocation, and consumption affect mortality risk in varying ways depending on historical, social, and household contexts.

In their comparative research on mortality patterns and responses to short-term economic stress, the Eurasia Project (EAP), found broad similarities in mortality levels across European and East Asian populations. However, responses to short-term food price variations were more diverse. Socioeconomic differences in mortality responses reflected the institutional and socio-political environments in which households were embedded. There was a stronger mortality response and socioeconomic gradient in mortality in Western communities than in Eastern communities that mirrored higher levels of inequality in landholding in the West and better organized state responses to shortages in the East (Lee and others 2004). In historical European communities, access to land protected children from variability in food prices (Bengtsson and others 2004). Even in relatively poor and remote regions, such as Southern Sweden, food-producing households were able to shelter their members from increases in food prices, as farming households could adapt their consumption and production to ensure that household members were fed before food was sold on the market. These findings have been replicated in other remote European communities, including Northern Scotland (Jennings and others 2017). Socioeconomic stratification in demographic responses to short-term stress accord with relatively straightforward predictions concerning access to resources and mortality risk.

However, the EAP project dug deeper into East-West differences by testing predictions about the role of household structure and composition in demographic responses to short-term stress. Their household models moved beyond concepts of unitary household decision making to consider agency and power structures within households in an approach consistent with bargaining models of the household developed in economics. While the balance of total production capacity and consumption needs of a household are important predictors of resource availability and the associated wellbeing of household members, models that view the household as a single, unified entity over-simplify the internal dynamics of household activities (Wong 1984). Instead of modelling households using a single production, consumption, or utility maximization function or framing household decisions in terms of an authoritarian head or group consensus, alternate approaches address the potentially competing goals of individual household members (Agarwal 1997). Thus, the household bargaining approach directly considers the competing interests of household members and the incentives and disincentives to cooperation (Mattila-Wiro 1999; Behrman 1990).

Households operate within a set of constraints and when essential resources, such as food or money, are insufficient to meet household needs, allocation within the household may have important implications for the survival and reproduction of household members. Even when food is sufficient, household allocation may contribute to elevated risk of malnutrition in some contexts (Messer 1983). Researchers have observed variation in resource allocation within households. Sometimes males are favoured, sometimes females are favoured, sometimes adults

are allocated more resources, and sometimes children are protected to the potential detriment of adults (Graham 1997). Resource allocation is associated with the health and wellbeing of individuals, especially potentially vulnerable household members such as children, elders, and in some societies, women (Das Gupta 1997). Allocation decisions are partly driven by cultural or economic preferences, which may or may not fit with evolutionary or behavioural ecological explanations. Such explanations may help address why households preferentially direct resources to certain members, and whether these differences can be understood in light of evolutionary theory.

In contrast to the socioeconomic gradient in mortality risk in Europe, in East Asian households, relationship to the head and other indicators of power and status within the household were related to mortality risk (Tsuya and Kurosu 2004; Campbell and Lee 2004). In Japanese villages, female infants were more vulnerable than male infants to short-term economic stress (Tsuya and Kurosu 2004). Among adults, women with less powerful positions in the household, such as daughters-in-law and non-stem kin members (those not the spouse, mother, or daughter of the head of household), faced higher mortality risks. Similarly, non-head adult men experienced higher mortality, an indication of the benefits of the authority conferred by household headship. Further, there were negative effects on the mortality of male children in households that co-resided with a grandfather, possibly indicating intra-household competition for resources.

In Chinese communities, the mortality of women and children was sensitive to the configuration of kin within the household (Campbell and Lee 2004). Intra-household allocation processes were associated with these differences in mortality risk (Campbell and Lee 1996). Widows, widowers, and orphans experienced higher chances of death. A woman's mortality was conditioned on whether she had produced an heir, as women with at least one son were at lower risk of mortality than those who had no children or only daughters. Elder males could make strong claims on household resources. In households with grandfathers, children had higher mortality, a finding that reflects how norms about allocation and power relationships may override a strategy drawn from evolutionary theory that would favour the survival of the youngest generation with greater reproductive potential over the eldest, post-reproductive generation.

Standing in the household hierarchy also affects mortality risks in community contexts outside of historical East Asia. For example, in contemporary rural Punjab, women's and children's mortality risk were associated with their relative standing in the household hierarchy (Das Gupta 1995). During times in the life course when women's power and autonomy were lowest, they experienced excess mortality relative to age-matched men. When their position in the household hierarchy improved, women's excess mortality risk was reduced. In this community, women's power and autonomy was lowest after marriage and during their early childbearing years, the period when reproductive potential is high. Indeed, even infant mortality rates reflected status within the household, as infants were more likely to survive if a mother gave birth in her natal household, where she enjoyed higher status, than in her husband's household, where her status was low. The intra-household allocation of authority and resources disadvantaged reproductive women, a group that expectations drawn from evolutionary theory would typically favour for resource allocation.

Fertility

Characteristics of households, such as household size, sibship composition, and the presence of certain types of coresident kin, can affect reproduction, one of the defining household activities. Evolutionary literature has influenced the analysis and interpretation of household data often drawn from historical demographic studies. Within this line of research, hypotheses concerning the relationships among household variables and fertility outcomes reference literature related to the grandmother hypothesis (Alvarez 2000; Hawkes and others 1998; Hawkes 2003) and models of human cooperative breeding (Mace and Sear 2005; Kramer 2010; Sear and Coall 2011) to support expectations about the potential fertility-enhancing role of post-reproductive household members or others who may help reproducing women, such as older children (Turke 1988). Indeed, comparisons can be made between life history theory and household ecology. For example, both approaches suppose a shared or pooled budget, although the units over which budgets are pooled differ, as life history theorists often focus on parent-offspring and alloparent-offspring pooling while household ecologists consider all household members as part of the shared consumption and production budget (Kramer 2018; Kramer and Boone 2002; Kramer and Ellison 2010; Reiches and others 2009; Laslett 1983; Hirth 2009; Hunt 1979; Reyna 1976; Schmink 1984).

While borrowing from evolutionary theories, historical studies have arrived at mixed results concerning household effects on fertility outcomes. Returning to the findings of the EAP group and related historical demographic research, household effects on fertility appear to depend on systems of household and family formation that differ both within and between the East and West (Dong 2016). Socioeconomic status was found to be an important resource for reproduction in historical Europe, while power within household hierarchies determined reproductive decisions in historical East Asia (Lee and others 2010). The kinds of individuals present in the household, especially certain types of coresident kin, were associated with fertility. In the East Asian populations, having a coresident elder female (mother or mother-in-law) in the household increased fertility of women, but only if the older woman did not have an aged husband to care for (Feng and others 2010). The presence of coresident married children lowered the chances of a birth, especially second order and higher male births, an indication that male births were restricted after a patrilineal heir was produced. In households with more than one married couple present, women's relationship to the household head signalled their position within in the household power hierarchy. Household heads and their spouses were more likely to reproduce and began their reproductive careers at younger ages. Women further removed from the household head were less likely to give birth.

Given the low frequency of extended coresident kin observed in historical Northwest European households relative to other regions of the world, such as East Asia, researchers have begun to expand beyond strict definitions of household co-residence to identify non-co-resident kin living in close geographic proximity and assess whether these relatives affected fertility outcomes. However, the effects of coresident kin in European and North American contexts may be mixed, especially in the case of post-reproductive adults. If small, nuclear family households were the norm, then the presence of the older generation would strain household budgets if ill, frail, or impoverished elders were taken into households unaccustomed to accommodating more complex kin arrangements (Hareven 1994; 1996; Kertzer 1995; Laslett 1988). However, a three-generation household would be an indicator of economic security, rather than strain, if it

formed when the elder generation retired and passed a farm or business to an heir or if three-generation co-residence was more commonly practiced among the wealthier classes (Ruggles 2009; Manfredini and Breschi 2013; Ruggles 2003; Alter 1996).

Given the opposing scenarios in which three-generation co-residence could occur historical European and North American communities, the effects of coresident kin may not easily align with simplistic predictions drawn from evolutionary theory, including cooperative breeding hypotheses. For example, in the historical United States, fertility was reduced by kin co-residence, especially in 3-generation households, possibly the result of overcrowding small dwelling spaces or poor health of the elder generation (Hacker and Roberts 2017), a contrast to the patterns described for East Asia. However, results were mixed concerning the fertility effects of spatially proximal kin, who would be nearby and could offer assistance yet were not subject to some of the unfavourable conditions associated with co-residence. Sometimes fertility was promoted, sometimes it was reduced, sometimes there was no clear effect, and differences were observed between different kinds of nearby kin, including paternal and maternal grandparents and siblings (Jennings and others 2012; Hacker and Roberts 2017; Willführ and others 2018). Some mixed results are found even in careful comparative analyses that construct similar measures and compare the effects of the same types of kin (for an example, see Dillon and others this volume). The integration of hypotheses drawn from evolutionary theory and social and historical analysis has the potential to contribute to the development of an analytical framework to address household effects on fertility that applies across a broader range of societies, enhances comparative research, and aids in the contextualization of these mixed findings. Bridging the household literature on competition and cooperation with the evolutionary literature on cooperative breeding and the smaller evolutionary literature on resource constraints and competition associated with fertility outcomes (Strassmann 2011; Mace and Alvergne 2012; Mace 2013; Schaffnit and Sear 2014) could be a fruitful avenue for collaborative research.

In addition to the fertility effects of cultural norms and expectations, such as differences in status afforded to age and sex groups within households described in East Asia, a household member's access to economic resources affects their bargaining power, which influences fertility behaviour. In Tanzania, birth intervals became shorter and fertility increased when women's power within the household changed (Lockwood 1998). With economic change, women's earnings, based primarily on rice production, were curtailed. When Islam began to displace traditional religious practices, gender norms shifted, and traditional postpartum sex taboos were not strictly enforced. Instead, women felt pressure to resume sexual relations sooner after a birth to shore up their relationship with their spouse, upon whom they were increasingly dependent. Thus, women's changing bargaining capacity within the household was associated with shorter birth intervals and higher fertility rates.

Fertility behaviour has been observed to respond differently to resource scarcity in varying household contexts. Fricke (1986) described household strategies among the Tamang of Himalayan Nepal. The Tamang practiced a diverse economy in an environment of resource scarcity, which included agriculture in marginal upland plots. Exchange and reciprocity among neighbours and kin groups were essential for the functioning of the household economy. Given diverse economic activities and the importance of extended kin networks, there was an incentive for high fertility. High fertility not only offset high infant mortality, but more children helped diversify the household economy and expand and reinforce local kinship networks

that households relied upon for exchange in times of need. In contrast, in historical Hungary, complex household formation and fertility control within households have been described as a strategy to address land scarcity by reducing the number of heirs and limiting the division of land (Andorka and Farago 1983). Similarly, in the land-limited and demographically saturated Krummhörn region of Germany, low fertility and high age at marriage limited family sizes within households (Willführ and Störmer 2015). Transmission practices, in this case impartible inheritance, also contributed to low fertility. Marriage and inheritance were essential decisions that balanced the demand for children and the needs of the youngest generation against the considerations of household alliances in Nepal or household landholding size in Germany and Hungary.

Intra-household Processes: Conflicts and Trade-offs Between Individual and Group Interests

Life history theory is concerned with how evolutionary forces shape responses to the trade-offs faced by organisms (Stearns 1992; Kuzawa and Bragg 2012; Hill 1993). Evolutionary researchers focus on trade-offs at the individual level, such as the allocation of resources to potentially competing processes, like growth, reproduction, and somatic maintenance. Households also face trade-offs, as their members must decide how to allocate limited resources within the household and must prioritize some household activities or members over others in times of scarcity. Indeed, reproductive ecologists conceptualize a shared energy budget at the level of the family or breeding community that is driven by cooperative breeding (Kramer and Ellison 2010; Reiche and others 2009), but a similar argument might be made for the shared budget at the level of the household. The decisions household members make when faced with trade-offs shape the characteristic household activities (production, distribution, transmission, reproduction, and co-residence) as discussed above with respect to household effects on fertility and mortality.

In addition to facing trade-offs, household members also negotiate potential conflict between individual and group interests. These conflicts can lead to household division and disagreements about the transmission of property and resources. Conflicts can also contribute to behaviours and decisions that may disadvantage some household members and privilege others. Given these fields' common interest in trade-offs, the development of joint household and evolutionary hypotheses about the internal dynamics of these important social units can advance our understanding of which household members are likely to benefit or suffer if risks and resources are distributed unevenly within the household and under what conditions unequal distribution occurs.

Household structure and composition affect household activities and vice versa (Netting and others 1984). For example, household economic productive capacity and consumption requirements are determined by the age and sex composition of household members. All other things being equal, a household with more net consumers relative to net producers should face greater intra-household economic pressure. The balance of workers to consumers changes as children are born into a household and grow up (Chayanov 1986; Hunt 1979). Thus, the internal "life cycle" of a household contributes to both consumption requirements and productive capacity. Household composition can be considered a determinant of intra-household competition for resources, especially in households with young children or elders.

In nineteenth century Orkney, Scotland, children were at higher risk of mortality in households with unfavourable ratios of consumers to producers and when twins were born (Sparks and others 2013). A similar pattern is found in contemporary Laos, where children in households with higher ratios of consumers relative to producers experienced higher odds of mortality, even after controlling for other household variables and unobserved inter-household heterogeneity (Tomita and others 2015).

Inheritance, retirement, and household division are times of potential conflict that highlight some of the tensions between individual and group interests. In societies where property is transferred between the generations, inheritance practices shape the transmission of resources. Inheritance is often a critical event in the household cycle and it is a time when the needs of the collective can conflict with the needs of the individual (Sieder and Mitterauer 1983). Household inheritance systems take two general forms, partible inheritance, in which multiple heirs have a claim, and impartible inheritance, in which only one person has a claim. Inheritance practices are a source of parent-offspring conflict in humans, especially when inheritance is impartible and one child is favoured over its siblings (Salmon 2008; Trivers 1974). Parents must balance offspring provisioning with maintaining a viable household economic enterprise, especially in contexts with limited resources, such as access to productive farmland. Inheritance practices can thus be viewed along a continuum of offspring provisioning, from equal provisioning of all offspring (some forms of partible inheritance) to directing all resources toward one offspring (impartible inheritance). Households do appear to use inheritance practices strategically and will, if possible, adjust household composition or manipulate social rules to adapt to either the underproduction or overproduction of heirs and ensure the continuation of the household (Goody 1976).

There are economic and ecological reasons to favour one heir over multiple heirs. If division of property is costly, impartible inheritance is often practiced. This is often the case for aristocratic families and farmers in contexts where smaller plots are ecologically or economically untenable or division is not allowed by the landowning class. Indeed, for farming households, it is possible to consider inheritance practices and access to marriage as part of a land-based breeding system where the combination of broader ecological conditions and the individual household's access to resources result in different strategies of inheritance (Hrdy and Judge 1993).

Inheritance, land, and household size and composition are closely related. If an economic niche is a prerequisite for marriage, then heirs may marry only after they inherit and non-heirs must remain unmarried or out-migrate (Engelen and Wolf 2005). If no such economic requirement for marriage exists, marriage will become more accessible. Population growth may be affected by these interrelated systems. In early-modern Saxony, population growth was higher and households were smaller in regions with partible inheritance, while larger three-generation households and slower population growth were associated with impartible inheritance (Berkner 1977). Impartible inheritance in this setting restricted population growth by stopping the fragmentation of land holdings, preventing the formation of new households, and encouraging the outmigration or celibacy of non-heirs.

The timing of inheritance often coincides with the retirement of the household head. In societies that lack access to financial institutions to save money for retirement or other insurance plans, the decision to step down from household leadership means an uncertain future for elders. In historical Europe, it was common for retiring household heads to insist

upon drawing up a contract with their heirs that specified precise levels of support as they aged (Gaunt 1983). Legal scholars at the time complained of the conflict between parents and their children. Heirs wished to inherit early, especially if marriage was conditioned on inheritance. However, parents were reluctant to give up their position and authority as household head and rely upon their children for their upkeep. Retirement contracts reflected the potential for, or at least fear of, the neglect of aging parents.

In complex household systems, such as those of joint-family households where multiple married couples and their families co-reside, household division was an additional source of intra-household conflict. Large households have certain economic advantages, as the presence of additional household members allows for the diversification of economic activities and hedges against risk (Lockwood 1998; Cohen 1976). Households that contain more than one married couple can reduce the magnitude of unfavourable fluctuations in the ratio of consumers to workers and benefit from economies of scale (Hammel 2005; 1972). Apparently aware of the economic benefits of large households, landlords often attempted to encourage large households and prevent their fission. In historical Russia, landlords were invested in the stability of farm production and prevented the division of households whenever possible (Czap 1983). In Poland, the interest of manorial estates in maintaining large households was often in conflict with peasant households that wished to divide (Kochanowicz 1983).

An analysis of the forces that unify and divide large complex households in Taiwan by Cohen (1976) provides a detailed account of the sources of tension within households and conflict between individual and group interests. Taiwanese households were complex, joint family households, where married adult sons remained in the household with their wives and children. The household head was responsible for the allocation of household resources and claimed the income or labour of any coresident children and redistributed it to household members. Children were entitled to the resources required for a proper and timely marriage and married sons could demand a portion of household income or a household division. Once children reached marriageable age, tensions arose between the generations in the household. The household head was primarily interested in the survival of the household estate, while married sons were motivated to claim as much of the household resources as possible to provision their spouses and offspring. For the older generation, a further disincentive to household fission was the position of the household head and spouse after division. The former head and his wife would become the dependents of one of the resulting smaller households, which would be a loss of status and power for the older couple.

The benefits that accrued to large households also led to the risk of household division. Cohen (1976) documented how brothers competed and argued over household partition. Their wives took sides in the arguments, especially if they felt that the intra-household allocation of resources was unequal or unfair. This was common when one married couple had more dependent children and therefore received a larger portion of household resources. The couple with fewer children, in effect subsidized the fertility of the couple with more children through the logic of income pooling and redistribution. Household fission became imminent when sharing and pooling of resources failed or if there was outright embezzlement of household funds. Cohen argued that household unity could only prevail if it was in the economic interest of all parties. However, not all sub-units of the household would benefit equally from household partition, as some received greater benefits from the efficiency of the larger

work group than others. The process of household division could disadvantage some former household members, especially if the benefits of large households were lost after partition. Interestingly, household economic diversification appeared to reduce the chances of household division, as the potential gains related to division of labour and task specialization were greater. It is possible that household and evolutionary approaches together can provide a framework to understand the dynamics of household conflict and fission.

Discussion

Households are the social unit home to intersecting activities that shape demographic behaviour, often some combination of production, distribution, transmission, reproduction, and co-residence. As such, they may overlap with family and kin groups, but they are not equivalent entities as households are distinct from families and feature different internal dynamics and pressures. Cultural practices and social institutions influence household effects on outcomes of interest to an interdisciplinary set of researchers, including survival and reproduction, as they are a factor in determining who is present in a household, the relative frequencies of types of household activities, and the structure of internal power dynamics and bargaining. Indeed, it has been argued that “households are the level at which social groups articulate directly with economic and ecological processes (Wilk and Rathje 1982: 618).” Given the essential functions and role of households in shaping individual behaviour and social contexts, it is time for closer collaboration among household and evolutionary analysts.

While there is a well-established body of work at the intersection of human evolution and kinship or family (Emlen 1995; Davis and Daly 1997; Salmon and Shackelford 2008) and evolutionary demographers frequently examine kin effects on behaviour, fewer evolutionary studies explicitly examine the effects of household composition, structure, or dynamics on behaviour. The challenges in household definition and measurement described above may contribute to this lack of integration, but there is potential for fruitful work at the intersection of human evolution and household analysis. I suggest that the rich understanding of household activities, morphology, and change that come from historical, anthropological, and demographic research can be usefully combined with theories and hypotheses from evolutionary analysis to understand behaviour. Together, these perspectives can enhance our knowledge of the ways that households affect life chances and complement evolutionary analyses of kin and family effects on demographic outcomes. Further, coordination among household and evolutionary researchers can advance the analysis and interpretation of rich historical and contemporary household data sources, development of theories and hypotheses that incorporate household variation and change within and between societies, and establishment of new collaborative research in the social and evolutionary determinants of demographic behaviour.

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1 Note this chapter has been posted on the Open Science Framework website since 27/02/2020, after it was accepted for publication, so the references will reflect when the chapter was written and not the OBP publication date.

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