

Krummhörn (North-West Germany), 18th and 19th century

Jan Beise

A. Data

The data describe a historic population of the “Krummhörn” in Northern Germany from the 18th and 19th century. Information derive from church registers, as well as tax rolls and other records of the Krummhörn region. The information are compiled to complete family histories based on the methods of family reconstitution. Family records include information on both the identity of the parents of the couple and the identity of the potential future marriage of the children. This allows to link families over generations. At present, data collection has been completed for 19 of the 32 parishes in this region. Although a few parish registers had been kept since the 17th century, data could not be considered reliable until the 18th century, when partial under-registration (especially of stillbirths and children who died young) was able to be ruled out. The observation period ends in 1874 when the task of registration of vital events went from the church over to civil institutions.

Currently, the vital statistics and some social data from slightly more than 23,000 families are available, but requirements of the present analysis concerning the completeness of information reduce the number significantly (see below).

The population

In 18th and 19th century, the Krummhörn was an ecologically and culturally separate region in Ostfriesland (Northwest Germany). This region is bounded by the North Sea on three sides, and borders on a relatively infertile heath in the east. The region has an area of about 150 km² and mainly consists of very fertile marsh soil. This fertile soil has been responsible for the great wealth that farmers have been able to achieve as of the end of the Middle Ages. A capital and market-oriented agriculture was able to develop here and it replaced a pure subsistence economy earlier than elsewhere in Germany. In contrast to the neighboring heath and moor regions, large-sized businesses dominated the farming economy. By the end of the 19th century, the marshlands covered only about 7% of the whole area of the province of Hannover, but produced over 22% of the agricultural profit (Meitzen 1894).

The process of settling the region was already completed by the end of the Middle Ages. As no common land was available any more since this time and due to the isolated location of the Krummhörn, a substantial increase in the population could not be supported – by either a geographical expansion of the population or an increase in its density. Therefore, the population was characterized by a very low growth rate for a long time and had a nearly stable cross-sectional size of approximately 14,000 individuals during the period under study. In a socioecological context, is it possible to describe the Krummhörn as a saturated habitat consisting of only a limited number of available breeding places.

Wealth (general considerations)

The social organization of the population was structured almost exclusively by the possession of land. The amount of land owned or under lease was decisive for the right to vote and the right to stand for election – both in the sphere of politics and of the church. The accumulation of returns led to remarkable wealth concentration in some lineages.

Consequently, a “two-class society” developed, with big farmers who owned both the land and the capital on the one hand, and a large mass of landless workers on the other. In most villages, a middle class was almost completely missing. In general, the social differences were extremely pronounced, not only with regard to the material aspects but also to the non-material aspects of daily life.

Transmission of wealth

The rule of undivided inheritance prevailed in the Krummhörn. Traditionally, the youngest son inherited the landed property (ultimogeniture), although this habit became more flexible in the latter half of the 19th century. Non-inheriting siblings had to receive financial compensation from the heir – as a rule, brothers received twice the amount that their sisters did. It has to be understood, that this inheritance pattern put a large economic pressure on the main heir. Although the land did not get divided up but changed to the next generation unified, it was usually in the responsibility of the main heir to compensate his siblings – either by selling land or realizing other forms of capital. The social group of “true” farmers (which we defined as having 75 and more “grasen”) have been well aware of these risks and manipulated both their reproductive behavior as the dispersal pattern according to a “local resource competition” situation (Voland & Dunbar 1995, Beise & Voland submitted).

Sample

The sample (see Table 1 for a short statistical description) consists of all families whose marriage got recorded in one of the 19 evaluated parishes. We restricted the sample to marriages which took place before 1840, leaving 35 years to the end of observation period. From the resulting 5821 families we have only for 1010 families information about the size of land owned or leased for both the parents and at least one child. To these 1010 families 9188 children were born in total, for 1602 of those we have again information about their own wealth as adults (785 sons, 817 daughters). Thus, the effective sample comprises 1602 parent-child pairs.

Table 1: Data sample of families with information about wealth

	kh19
N families	1010
N children (sons) born	9188 (4627)
N children (sons) survived to adulthood and with information about wealth	1602 (785)
Period of data coverage (year of marriage of parents)	1692-1839

Details of wealth measures

The tax rolls give the amount of land owned or leased in the measure “grasen”: 1 grasen = 0.38 ha. Due to the social structure of the Krummhörn (see above) we have many landless workers with zero values for wealth. A size of 75 Grasen was historically regarded as the lower limit for a “full” and self-sustainable farm and defines the group of “(full) farmers”.

For most families we do not have any information about wealth because they never got mentioned in tax rolls. For some families we found entries in up to 10 tax lists from different years (which usually differ in their values), but for most families we just found one or two entries. According to our original purpose of this variable we recorded only the highest value.

Table 2 gives a summary of the wealth measure for this sample: “grasen” refers to the size of land of the father and “kgrasen” to the size of the child (k like kid).

Table 2: Wealth measures as raw and logged values (grasen: size of land of parents, kgrasen: size of land of child)

MEASURES	grasen	kgrasen		grasen.log(2)	kgrasen.log(2)
N	1010	1602		1010	1602
Mean	32.2	31.2		2.24	1.56
Std. Deviation	55.5	60.5		1.56	1.97
Variance	3077.3	3658.2		3.89	2.43
Coefficient of variation (1)	1.72	1.94		0.70	1.27
Minimum	0	0		1	1
Maximum	394	582		5.98	6.37

(1) std. deviation divided by the mean

(2) values smaller than 1 in the raw measures got substituted by the value 1

Analysis

Since in the Krummhörn both sexes inherited wealth (although not equally) I analyzed the data for both sexes combined and separated.

B. Parameter Estimates

Distribution of wealth and correlations between generations

Figure 1a shows the distribution of the size of land owned or leased for both the parent as the children generation. The sample is extremely skewed: roughly one half of the sample is composed of people without any land, the other half is distributed over a range of 394 grasen for the parents and 582 grasen for the children. It has to be noted that due to some source specific properties the number of landless families are highly underestimated while the those with property and in particular the wealthy farmers are more or less completely recorded.

Figure 1b shows the relationship between land size of parents and children, the corresponding correlation coefficient are listed in table 3. Due to the extremely skewed distribution of the sample I calculated additionally Spearman coefficients (corrected for ties).

Table 3: Correlation coefficients for relationship of size of land between father and children (all correlation coefficients have a $p < 0.001$)

	All	Sons	Daughters
a) raw			
Pearson	0.54	0.56	0.51
Spearman	0.67	0.71	0.64
b) log			
Pearson	0.68	0.71	0.66
Spearman	0.67	0.70	0.64

Note, that the panels in figure 1b do not account for the weight of the data points. The social mobility was in general quite low and the upward mobility was extremely low as can be seen in table 4 where the relationship between parental and child wealth is simplified by grouping the families in four wealth classes: 83% of children of landless parents were as adults without land themselves and just 1% of children of these parents could move in the highest wealth class (and these may be rare cases of local not-agricultural upper or middle class like merchants who married in a farmer family).

Table 4: Social mobility on the base of size of land (as probability to move from one land owning group to another one).

		Child				n
		0	1-24	25-74	75+	
Father	0	0.83	0.14	0.01	0.01	740
	1-24	0.50	0.34	0.06	0.10	343
	25-74	0.30	0.23	0.19	0.28	158
	75+	0.09	0.18	0.17	0.57	361

Regression Coefficients

The model regressed the logged value of the parents on the logged values of the child (see Table 5). I did not include age for parent or child because of the nature of the data describing a historic population and the specific evaluation of the wealth measures (see above "Details of wealth measure").

Instead the number of surviving siblings (survived to age 15) is included in some of the models, since this influenced the size of the share to inherit from the parental wealth.

Table 5: Summary of regressions

	All.1	All.2	Sons.1	Daughters.1	Sons.2	Daughters.2
	□	□	□	□		
(intercept)	0.404***	0.690***	0.427***	0.589***	0.412***	0.560***
grasen.log	0.664***	0.667***	0.690***	0.643***	0.691***	0.644***
sex (0=M)	-0.068	-0.075				
siblings		-0.066***	-0.042	-0.087**		
brothers					-0.064+	-0.101*
sisters					-0.013	-0.082*

*** p<0.001, ** p<0.01, * p<0.05, + p<0.1

C. Interpretation

The □ coefficients are comparatively high and actually quite similar to the values of Kipsigis sample of pioneers. But contrary to the Kipsigis the habitat of the Krummhörn population was a rather saturated environment. The high □ coefficients reflects the observed low social mobility in this population (Table 4) which can be attributed to several factors: First, since all land was distributed and common land almost non-existent a social upward mobility by hardly possible by own means in this agricultural population. Furthermore, the strong calvinistic background led to strict separation of workers and farmers in all kind of material and non-material aspects, which hindered a social mobility also from a cultural point of view (disregarding the difficulties due to the economic conditions). Farmers and workers also differed in many behavioral aspects – from mating strategies (Volland & Engel 1990) over parental strategies (Volland & Dunbar 1995) to dispersal behavior (Beise & Volland, submitted). Farmer families – well aware of the economic burden which too many sons bore for the farm business – actively manipulated their reproduction in terms of number and sex composition of their children (infant mortality risk for sons increased with number of older brothers). Still, farmers families in general “over-reproduced” which led – given the saturated habitat – to a demographic downward pressure. But this pressure got partially compensated by the preference of “superfluous” sons to stay single and remain as helpers on the brother’s farm than to accept downward social mobility by marrying “below their class” and being forced to establish a new household with reduced resources (Volland & Dunbar 1995). These celibate sons are not represented in this study sample since they do not show up in the tax lists. The same applies for those similar positioned sons who preferred to emigrate. We have no information about their wealth status. All these special traits of the population biasing the □ coefficients towards higher values.

D. Other considerations

Selection bias in the sample

There are several issues in this dataset which influence the estimation of □

coefficients. One is that in our sample (but not the data set) the wealthy population is heavily over-represented. This is due to the kind of information the tax lists are providing. Although the whole population at the time of the tax survey is recorded, not all of them are listed together with the size of land they owned or leased. While only for the farmers and land owners the size of land is given (however small or big), other professional categories are listed without this information. While we can safely assume, that “farm workers” had no land we can not be as sure about “Warfsleute” who could have land of minor sizes or not. Thus, farm workers are represented in our sample having no land, but “Warfsleute” are not included since we have no information about their wealth. In short, while the sample includes probably most persons owning land, many landless families are missing in this sample. Considering how low social mobility was, this bias is likely leading to a lower β compared to an unbiased sample.

Out-migration

Almost 30% of all children born to local families migrated at one point in time out of the region (Beise & Voland, submitted). For the children of farmers – but not of workers – the risk of emigration increased with the number of siblings. It is likely that their decision to emigrate was related to their decreased economic chances at home due to the many competitors for the bequest. Thus, losing selectively cases which does not show a good fit between parental wealth and child’s wealth is biasing the estimation for β upward.

Multiple marriages

Although divorce was almost non-existent remarriage after the death of the spouse was common – in particular for men and in the higher social class. We have information about remarriages and can assemble full reproductive histories of persons over several marriages (not yet done in the current sample).

References

- Beise J. & Voland E., submitted: Intrafamilial resource competition and mate competition shaped social-group-specific natal dispersal in the 18th and 19th century Krummhörn population. (submitted to American Journal of Human Biology).
- Voland E. & Dunbar R.I.M. 1995: Resource competition and reproduction - The relationship between economic and parental strategies in the Krummhörn population (1720-1874). *Human Nature*, 6: 33-49.
- Voland E. & Engel C. 1990: Female choice in humans: a conditional mate selection strategy of the Krummhörn women (Germany, 1720 - 1874). *Ethology*, 84: 144-154.

Figure 1a. Distribution of grasen of parents (grasen) and children (kgrasen)
Figure 1b Scatterplot for raw and logged values of grasen with kgrasen (Note: size of symbols does NOT indicate the weight of this data point).

