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# Kinship Network, Direct Childcare, and Fertility Among Hungarians and Gypsies

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**This study is based on fieldwork that was conducted in a Gypsy and a Hungarian non-Gypsy population. The main goal of our study was to examine the primary factors having the largest impact on Gypsy fertility. Contrary to widespread views—based mainly on anecdotal evidence—level of education, occupational status, or use of contraceptive pills does not seem to have a profound influence on the number of births. In fact, the evidence suggests that the extensiveness of kinship networks and the degree of the relatives' assistance with childcare are most strongly predictive of fertility in the Gypsy population. Our data proved to be highly supportive of the evolutionary hypothesis that personal services through kinship networks are particularly valuable resources, accounting for the higher fertility in more traditional societies compared to technologically more advanced ones. © 1998 Elsevier Science Inc.**

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One of the most striking differences between Hungarian Gypsies and non-Gypsies (“Hungarians”) is their different rates of fertility. According to data from the 1980 census, Gypsy women averaged 3.54 live-born children, whereas Hungarian women had given birth to only 2.08 newborns (Bereczkei 1993).

Although no detailed survey has been conducted about the factors leading to the higher fertility rate of Gypsies, several suggestions have been made as to the possible link between the Gypsies' particular way of life and their fertility (Cohn 1973; Erdős 1958; Hooz 1991; Mészáros 1984; Okely 1975). One argument holds that the high frequency of births is due to their low level of education,

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which is associated with a poor anticipation of the future difficulties imposed by a large number of children. A related argument focuses on contraception. Because Gypsies have more limited access to modern technological and medical devices, they are much less able to control their fertility than Hungarians. A third possible interpretation assumes a negative correlation between socioeconomic status and fertility. Because the majority of Gypsies are unskilled workers and many of them are unemployed, they do not feel compelled to sacrifice reproduction for “cultural goals” as much as Hungarians with higher average socioeconomic status.

Although these hypotheses are quite plausible, none of them has been tested rigorously. Their empirical basis comes from anecdotal descriptions and demographic samples using indirect data. Over the past years evolutionary explanations have been raised that aim at investigating the ultimate-adaptive character of fertility differences between the two ethnic groups. Using a scale of r-K strategy, resource predictability and social uncertainty (measured by low income, frequent unemployment, high risk of hard work, a large number of dependent family members, frequent moving, etc., proved to be important components of the Gypsies’ way of life that contribute to their higher fertility and mortality (Bereczkei 1993). Another study has revealed that, in the urban populations, Gypsies invest more heavily in their daughters than Hungarian families do, and this strategy pays in terms of maximizing fitness (Bereczkei and Dunbar 1997). Among rural Gypsies, early-born daughters engage in substantial help related to childcare (helping-at-the-nest), and this assistance enhances their mother’s reproductive success (Bereczkei, in press).

Although these studies shed some light on the factors affecting high fertility, some basic mechanisms are still left unexplained. First of all, what role does the kinship network play in fertility and the upbringing of children in the traditional communities of Gypsies? According to evolutionary theory, human beings, like other living beings, have been designed by natural selection to increase their inclusive fitness through striving to acquire resources that can be transformed into reproduction (Betzig et al. 1988; Smith and Winterhalder 1992; Trivers 1985). Besides producing children, support of other relatives, who carry common genes shared by descent, is another route by which individuals perpetuate their genes (Hamilton 1964). Many studies have revealed that people prefer close kin to distant ones or to nonrelatives, and help them in a way likely to enhance their reproductive success (Burnstein et al. 1994; Chagnon 1979; Hames 1979; Hughes 1988). This strategy occurs both by transmitting material resources such as wealth or status to nondescendant relatives and by taking direct care of young relatives (Berté 1988; Dunbar and Spoons 1995; Dunbar et al. 1995; Essock-Vitale and McGuire 1985; Hewlett 1988; Johnson and Johnson 1991).

Turke (1989) argues that, in traditional societies, extended kinship networks function to disperse the costs of childrearing through personal services (attending, nursing, teaching, etc.) provided by emotionally committed close kin. Increasing the complexity and number of routes to social and economic success for individuals, that is, modernization, leads to the breakdown of these kinship networks. Therefore, although women in modern societies are, on average, wealthier than in traditional societies, they have fewer resources available for reproduction, because they lack

significant help from close kin. In addition, they are expected to devote much effort to education and to the consumption of luxuries for their children to compete effectively for social and economic success. As a consequence, the opportunity cost of rearing children increases, and parents in a modern society concentrate their resources on potentially successful but small numbers of children.

This hypothesis may explain the difference in fertility between Gypsies and Hungarians. The main goal of the present study is to investigate the relationship between reproductive success and kinship assistance in two populations that represent different levels of cultural and economic development. To achieve this goal, various subsets of questions have to be answered. Can the "traditional view" be held that high fertility is a function of low level of socioeconomic status and poor education? How is the kinship network organized, and what types of personal contacts are prevalent among relatives? What type of residence and family arrangement is associated with the extended kinship network and assistance? What is the net flow of services and resources between close relatives engaged in childcare of each other's children? The results also may provide some insight into the mechanisms of demographic transition that the Gypsies do not seem to have yet surpassed.

## METHODS

### The Populations

The present study is based on fieldwork that was conducted between April 1994 and June 1995 in a Gypsy and a Hungarian population. A rural Gypsy population that extended to several villages, within an approximately 10-km district, was examined. Our fieldwork included the village of Gilvanfa inhabited almost exclusively by Gypsy people, and three neighboring villages (Magyarmecske, Besence, Bogádmindszent) where an ethnic mixture of Gypsies and non-Gypsy Hungarians live. The Gypsies living in these areas constitute an ethnically homogeneous population, called "Beás," with endogamy, distinct traditions, and a way of life slightly different from the rest of Hungarian Gypsies (Erdős 1957).

The first Gypsy groups arrived in Hungary in the 15th century and were followed by hundreds of thousands. They rapidly spread in the country in their caravans of wagons. In the beginning, they filled economic gaps left by the Turkish occupation of Hungary in the late Middle Ages. They were needed as miners, horse dealers, and craftsmen in the destroyed economy. They wandered across the country and temporarily settled down where their labor was demanded (Tomka 1983). However, after their special trades could no longer be pursued due to modernization, a large number of them became impoverished. During the past century, they gradually settled down near Hungarian settlements or in the villages abandoned by Hungarians or other ethnic groups (Barna 1993).

Although their life conditions have changed a lot, especially during the past 100 years, many features of their social organization and culture have remarkably preserved their original character. Even today they live in an extended kinship network and keep a high level of independence from ethnic Hungarians in their social

and family life (Gmelch 1986; Szegő 1983). Their integration into Hungarian society is very poor in spite of the fact that only a minority of them have preserved their language, folk art, and original religion. The majority of them still live in villages, mostly on the edge of the villages, or in separated colonies. At the same time, more and more young Gypsy people settle down in the towns and cities. They are searching for a better subsistence, but they follow a way of life drastically different from that of Hungarian non-Gypsies as far as daily customs, dressing, temperament, and other characteristics are concerned (Utasi and Mészáros 1991).

Gypsies are the poorest people in Hungary, with a low level of education and socioeconomic status, and a very high level of unemployment (Hooz 1991). After the Communist political and economic system had collapsed, a certain level of stratification began among them; a few Gypsies became wealthy, but the overwhelming majority became even more impoverished, needing allowance and support from the central government and the local councils (Kemény et al. 1995).

As a comparison population, non-Gypsy Hungarians (“Hungarians”) living in the same villages also have been examined. Taking the standards of life prevalent in Hungary at large into consideration, the villagers here are regarded as poor and undereducated. They are mainly peasants, whose socioeconomic status and income exceeds that of Gypsies but falls behind the Hungarian average. Rural districts such as this historically have been underdeveloped in Hungary. In addition, they are the main victims of the recent economic and political changes that have increased the unemployment rate, particularly in certain areas of the country.

## Sample and Field Techniques

The number of adults beyond the age of 18 in the two rural populations was 779 (Gypsies: 433, Hungarians: 346). During our fieldwork, accurate genealogies were made as an important source of information about encounters and helping activities between relatives. I interviewed informants from each household, especially elderly people, to obtain the names, genealogical relationships, ages, current residences, and marital unions.

The interpersonal relationships in the kinship networks were assessed by instantaneous behavioral scans (Altmann 1974; Betzig and Turke 1986). On each occasion an adult individual was observed and the subject code, time, location, and behavior were recorded. The procedure started at a randomly determined time and place on the route that went through the entire village of Gilvanfa and Magyar-mecske. Because village houses were quite open for us and a relatively large part of social life occurred in public areas (in front of the houses, in the pub, etc.), observability was excellent. Over a period of 6 months, 26,000 observations were recorded and all the information we gathered for 154 routes on 135 days was coded on computer format sheets. On average, the scans were based on 78% of all individuals.

A substantial number of the observations (72%) involved interactions between two or more individuals in both Hungarian and Gypsy populations. “Interaction” was defined as communicating with each other, touching or in close proximity to

each other, and mutual cooperation (e.g., wood cutting in the courtyard, slaughtering pigs, planting in the garden, etc.) (Flinn 1988). Scan data were collected for the village dwellers who met each other, and for people living outside the village who visited the residents. Additionally, the frequency of the residents' visits to other settlements was recorded. If an individual was absent from the village while I was conducting a scan, I asked the nearest available family members where that individual was and what he or she was doing. This observation often was verified by walking out to the edge of the village and observing people going to or coming from the neighboring villages, or by observing them taking buses to travel to other places. Finally, the observations for scans were lumped into seven genealogical categories (parents, siblings, grandparents, grandchildren, uncles/aunts, nephews/nieces, cousins), and the frequency of encounters was recorded for each category.

Using instantaneous scan sampling, I could observe people engaged in childcare and various helping activities. The majority of these interactions were observed between dyads who temporarily or permanently lived together. However, more accurate information was gained about the flow of altruism in the circle of kinship groups by using questionnaires. Thirty-four questions were put to the subjects on this issue, such as "Did you take care of children other than your own offspring?"; "Did you spend any money, and if you did, how much, on supporting children other than your own offspring?"; and "Did you ever get any assistance in raising your children from your relatives?".

Childcare was divided into two groups. "Material support" was defined as a certain amount of resources habitually provided by men and women to their relatives' children (by definition, resources that were equal to at least one tenth of the caregiver's monthly income). For example, an uncle was taken into account who frequently gave money to his sister to buy clothes for his niece, or habitually bought toys and other goods for his young relatives. We called "direct childcare" personal assistance—such as nursing, grooming, playing, keeping an eye on children, cooking for them, etc.—that occurred frequently over a relatively long period of time (by definition, that occurred on average as frequently as a minimum of 30 hours in 1 month), for example, childcare provided by an aunt who habitually visited her sister's neighboring house over several months and looked after and cooked for her nephew. Although these categories might seem arbitrary, using accurate questions we could assess what percentage of adults habitually engaged in both intensive childcare and intensive material support during the period of our fieldwork.

Because we focus on fertility differences and long-term helping activities, individuals with completed fertility were interviewed. The final sample was selected to include all Gypsy and Hungarian women who were more than 45 years of age, that is, who had completed their reproductive careers. That sample included 189 Gypsy adults (108 women and 81 men) and 202 Hungarians (123 women and 79 men). All 391 individuals were interviewed, using a questionnaire with 380 variables. Subsets of the questions referred to the following issues: family background and upbringing, education, occupation, income, birth control, fertility and mortality, and household composition. Reproductive success was measured by the number of children who survived more than 1 year.

## RESULTS

### Fertility Differences

The fertility of Gypsy women more than 45 years of age far surpasses that of Hungarians in the same age group. Gypsy women with completed fertility gave birth on average to  $3.93 \pm 2.14$  newborns, whereas Hungarians had only  $2.32 \pm 1.24$  (Mann-Whitney,  $U = 8.25$  (108, 123),  $p < .0001$ ). The most characteristic group among the Gypsies comprises women who gave birth to four or more children; 35.6% of them compared to only 10.2% of Hungarians.

At first glance, this difference in fertility appears to be due to differences in education and occupational status. The percentage of Gypsy men and women who continued their studies after finishing the eight classes of primary school (compulsory in Hungary) is only 17.1%, compared to 53.8% among Hungarians ( $\chi^2 = 74.54$ ,  $p < .0001$ ). However, standardizing for education, fertility differences do not change profoundly. Considering those Gypsy and Hungarian women who had finished only primary school, the difference in fertility remains significant [Mann-Whitney, Gypsies:  $3.75 \pm 2.21$  ( $N = 90$ ) and Hungarians:  $2.46 \pm 1.32$  ( $N = 57$ ),  $U = 3.56$ ,  $p = .0004$ ]. In other words, Hungarians who had the same (low) level of education as the majority of Gypsies still bore a relatively low number of children.

Similarly, large differences have been found in occupational status between the two ethnic groups; 73.8% of Gypsy men are unskilled workers, compared to 21.8% of Hungarians without a certificate of trade ( $\chi^2 = 80.50$ ,  $p < .0001$ ). However, when we compare Gypsy and Hungarian women with unskilled husbands or cohabitants, the average difference in fertility remains the same [Gypsies:  $3.98 \pm 2.14$  ( $N = 60$ ) and Hungarians:  $2.33 \pm 1.28$  ( $N = 21$ ),  $U = 3.18$ ,  $p = .0014$ ]. A similar fertility difference also has been found when unemployed Gypsy ( $N = 69$ ) and Hungarian men ( $N = 35$ ) were taken into consideration (Gypsy:  $4.11 \pm 2.43$  and Hungarians:  $2.46 \pm 1.17$ ,  $U = 3.55$ ,  $p = .0004$ ).

Contrary to a widespread perception in Hungary, Hungarian rural women do not use more contraceptive pills than Gypsies. Table 1 shows that the percentage of Gypsy women who never used oral contraception slightly exceeded that of Hungarian women, but the difference is not significant ( $\chi^2 = 0.32$ ,  $p = .85$ ). However, we do not have exact data on birth control other than oral contraception. It is possible that there is a larger difference in the "more traditional" methods of birth control.

In sum, neither educational differences nor differences in occupational status and employment rate appear to explain differences in fertility between the two eth-

**Table 1. Frequency of Using Contraceptive Pills Among Hungarian and Gypsy Women**

Contraceptive pills	Hungarians ( $N = 123$ )		Gypsies ( $N = 108$ )	
	<i>N</i>	%	<i>N</i>	%
Never	64	52.0	62	57.4
Occasional	43	35.0	37	34.3
Habitual	16	13.0	9	8.3

nic groups. As stated previously, it is a highly unexpected result. Based mainly on anecdotal evidence, experts in this field have been convinced that Gypsies have more children because of their poverty, exploitation, and marginal status in the society at large. Now, we may have to give up this hypothesis—or at least limit its explanatory power—and seek other causes of high Gypsy fertility.

### Kinship Network

As several former studies have stated, Hungarian Gypsies no longer live in an extended household system; after giving up the wandering way of life and settling down, they have gradually shifted to a nuclear family residence (Hooz 1991). Indeed, in our sample, no significant difference was found in the number of adult cohabitants between the Gypsy and the Hungarian rural populations. The average number of adult family members living together was 1.94 for the Gypsies and 1.77 for the Hungarians ( $t = 1.54, p = .08, df = 370$ ). Large differences between the two ethnic groups appear, however, when we compare the number of relatives who lived in the subjects' village. Considering all the kin from parents to secondary cousins, Gypsy men and women had an average of  $19.25 \pm 11.69$  and Hungarians  $7.12 \pm 5.27$  relatives in their villages ( $U = 8.26 (433, 346), p < .0001$ ). In other words, the number of Gypsy kin who may be considered as potential helpers is almost three times as large as that of Hungarians.

The extensiveness of the kinship network is undoubtedly affected by the Gypsies' high fertility. They are born in a large circle of close and distant relatives. The subjects have an average of  $5.29 \pm 2.93$  siblings and  $11.01 \pm 6.42$  uncles and aunts, whereas these values for Hungarians are  $3.59 \pm 2.07$  and  $7.71 \pm 3.81$ , respectively (Siblings:  $U = 6.32, p < .0001$ ; uncles and aunts:  $U = 6.38, p = .0052$ ). The differences in the number of coresident relatives result from the historical fact that Gypsies arrived in the village in large kinship groups. Our genealogical study of people living in Gilvanfa has revealed that tightly bound and relatively separated kinship groups have settled down in the village during the past 100 years. Two major descent groups and a couple of smaller families constitute the recent community. The leader of the village belongs to the largest descent group; he listed more than half of the population as his relatives. The rural Gypsy populations maintain a relatively high level of endogamy (Berezkei and Dunbar 1997) that involves an extended kinship network in their settlements. This may explain the fact that the difference in the number of coresident relatives between the two ethnic groups (19.25 vs. 7.12) far exceeds the difference in their fertility (3.93 vs. 2.32).

Additionally, Gypsies keep much closer connection with each other than Hungarians; in fact, the extensiveness of the kinship network really involves a close personal relationship and communication among the relatives. Our scan data showed that Gypsy men and women spent much more time in the company of family members who live in different households, compared to Hungarians. Figure 1 shows that the average frequency of encounters between noncohabitant relatives is much higher for Gypsies than Hungarians (294 vs. 54). Especially large differences have been

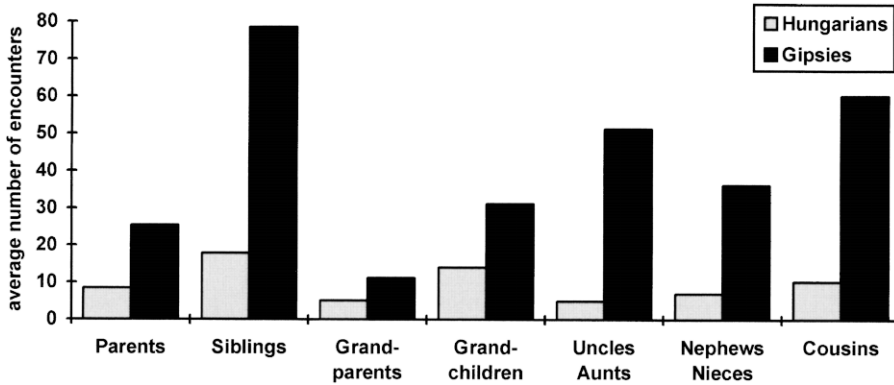


FIGURE 1. Frequency of encounters with the subjects' (noncohabitant) relatives.

found in encounters between the subjects and their siblings (78 vs. 18), uncles/aunts (51 vs. 5), and nephews/nieces (36 vs. 7).

As stated previously, the average number of cohabitant relatives in the Gypsy villages is 19.25. For Hungarians this figure is only 7.12. Now, we have seen that the magnitude of difference between the two ethnic groups in interaction frequency among relatives, on average, is even larger (294 vs. 54). In other words, the difference in the number of encounters far surpasses the difference in kinship size between ethnic Hungarians and Gypsies. Consequently, a higher level of interaction among Gypsy relatives cannot be explained simply by their relatively larger number, that is, higher fertility. Compared to the Hungarians, a Gypsy individual is likely to have more encounters including helping activities with any other individual from his or her kinship group, which may result from a different intensity of social life and different interpersonal relationships.

### Helping Activities in the Circle of the Kinship Group

The next question is whether the extended kinship structure and the frequent encounters between relatives in the Gypsy population simply increased nepotistic relationships. In other words, we want to know whether the intensive presence of relatives is transformed into altruism and helping activities provided by family members. Because we aimed at examining differences in reproductive output, those nepotistic relationships primarily brought into focus were those associated with childcare.

Several questions referred to the types of assistance with childcare during the subjects' childhood and adulthood. Compared to Hungarians, more than three times as many Gypsy men and women reported that they had been brought up by relatives other than their parents during a major part of their childhood (13.8% vs. 3.3%,  $\chi^2 = 6.25$  (108, 123),  $p < .05$ ) (Table 2). These children had been adopted by a close relative—mainly grandparents, sometimes an aunt or uncle—after their parents died, or because the parents gave up their children for certain reasons or proved to be un-

**Table 2. Percentage of Children Brought up by Parents or Other Relatives Among Gypsies and Hungarians**

	Hungarians ( <i>N</i> = 201)		Gypsies ( <i>N</i> = 188)	
	<i>N</i>	%	<i>N</i>	%
Both parents	185	92.0	140	74.5
Mother only	7	3.5	21	11.2
Father only	3	1.5	1	0.5
Relatives	6	3.0	26	13.8

able to raise children because of disease, imprisonment, etc. It also is notable how many Gypsy children live together with their mothers only.

Questionnaires provided us with extensive and detailed information about the kind and flow of assistance. Table 3A shows that there was no significant difference between the two populations in providing material resources as a contribution to childcare. Approximately the same proportion of Gypsy and Hungarian individuals—grandparents, aunts, uncles, and others—reported that they gave money to, or bought toys and clothes habitually for, their young relatives (for women:  $\chi^2 = 0.53$ ,  $p > .05$ ; for men:  $x = 1.04$ ,  $p > .05$ ). Such contributions may considerably reduce the parents' burden in taking care of their children. However, relatively few people provided material resources like these in either group, which may be due to the high level of poverty and unemployment in these districts.

On the other hand, Table 3B shows large differences in direct childcare, that is, investing time and energy in raising the children of close relatives. Gypsy women reported significantly more helping activities such as grooming, nursing, playing, talking, and keeping watch over their younger family members than did Hungarian women [ $\chi^2 = 17.01$  (108, 123),  $p < .001$ ]. The same is true for a comparison between Gypsy and Hungarian men. Although they are much less engaged in direct childcare than women, the difference is significant between the two ethnic groups ( $\chi^2 = 26.51$  (81, 79),  $p < .001$ ). Generally speaking, Gypsy people invest, on average, more than twice as much time in direct childcare for their relatives as Hungarians.

**Table 3A. Proportion of Gypsies and Hungarians Contributing Material Support**

Recipients	Hungarians				Gypsies			
	Women ( <i>N</i> = 123)		Men ( <i>N</i> = 79)		Women ( <i>N</i> = 108)		Men ( <i>N</i> = 81)	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
Siblings	5	4.1	2	2.5	7	6.5	4	4.9
Grandchildren	8	6.5	6	7.6	9	8.3	7	8.6
Nephews/nieces	5	4.1	2	2.5	4	3.7	3	3.7
Cousins	1	0.8	2	2.5	1	0.9	2	2.5
Younger nonrelatives	2	1.6	3	3.8	4	3.7	1	1.2
Older relatives	5	4.1	1	1.3	3	2.8	3	3.7

**Table 3B. Proportion of Gypsies and Hungarians Contributing Direct Childcare**

Recipients	Hungarians				Gypsies			
	Women ( <i>N</i> = 123)		Men ( <i>N</i> = 79)		Women ( <i>N</i> = 108)		Men ( <i>N</i> = 81)	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
Siblings	4	3.3	1	1.3	27	25.0	8	9.9
Grandchildren	22	17.9	2	2.5	39	36.1	21	25.9
Nephews/nieces	14	11.4	2	2.5	16	14.8	8	9.9
Cousins	2	1.6	1	1.3	6	5.6	2	2.5
Younger nonrelatives	6	4.9	4	5.1	21	19.4	8	9.9
Older relatives	33	26.8	12	15.2	25	23.2	17	21.0

### Kinship and Fertility

So far we have come to three main statements on the basis of our data: (1) Gypsies find themselves in a more extended circle of kinship groups than Hungarians; (2) They keep closer contact and engage in more intensive interpersonal relationships with their relatives; and (3) They provide their family members with a larger amount of direct childcare, compared to Hungarians, which may decrease the costs of the supported relatives' parental investment in their children. The final question we will address is the following: Are the extended relationships among the members of a kinship group transformed into enhanced fertility in the examined populations? Putting this question another way: Do women with a larger group of relatives have more children than those with fewer relatives?

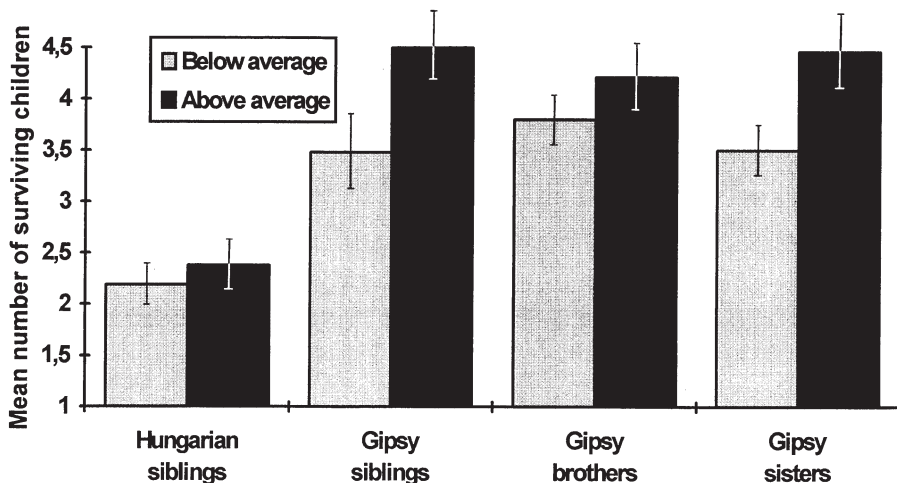
Measuring completed fertility (of women more than 45 years old) and considering the kinship networks that include relatives with an average coefficient of relationship (*r*) spanning from 1/2 to 1/16 (second cousins), no significant correlations were found between the number of the subjects' surviving children and the number of all of their relatives, for either Gypsies or Hungarians [for Gypsies: Spearman's rho = 0.15 (*N* = 108), *p* = .2680; for Hungarians: rho = 0.11 (*N* = 123), *p* = .4405]. Consequently, the extensiveness of the total kinship mass, in itself, does not appear to have a large impact on fertility. However, when close relatives who are more available for a long period of time and engage in a more personal relationship are examined, remarkable results are revealed.

First, the possible impact the grandparents have on the number of their grandchildren was examined. For this purpose, we distinguished grandmothers who died before age 50 from those who died after 50 or were older than 50 and still living, and thus could help their children in raising grandchildren for a longer period of time. The results supported our expectations; the subjects' parents in the Gypsy population who lived longer had significantly more grandchildren than those who died relatively early [ $>50$  years:  $4.33 \pm 2.40$  (*N* = 74) and  $<50$  years:  $3.18 \pm 1.81$  (*N* = 32), *U* = 2.71, *p* = .0082]. No significant association was found in the Hungarian population, but this may be due to the low number of subjects whose mothers died before 50 [ $>50$ :  $2.40 \pm 1.34$  (*N* = 74) and  $<50$ :  $2.14 \pm 1.31$  (*N* = 16), *U* = 1.0509, *p* = .2933].

Second, in examining the impact of relatives other than grandparents on subjects' fertility, a strong correlation was found between the number of siblings and the number of own children in the Gypsy population; the more sisters and brothers they have, the more children they have (Spearman's  $\rho = 0.31$ ,  $p = .0059$ ). Then we divided our sample into two parts at the mean of the number of siblings (mean = 5.29): one includes subjects having siblings below that mean, and the other one having siblings above the mean. Subjects having five or fewer siblings ( $N = 97$ ) have an average of  $3.48 \pm 2.53$  children, whereas those with six or more siblings ( $N = 87$ ) have  $4.50 \pm 2.81$  offspring ( $U = 2.85$ ,  $p = .0048$ ). Hungarians do not show a similar association; their fertility does not significantly increase as a function of the number of siblings ( $\rho = 0.14$ ,  $p = .1147$ ). Taking the mean number of siblings (3.19), Hungarian subjects having three or fewer siblings ( $N = 98$ ) have an average of  $2.19 \pm 1.06$  children, whereas those with four or more siblings ( $N = 89$ ) have  $2.38 = 1.69$  children ( $U = 0.87$ ,  $p = .38$ ). In other words, the number of the subjects' siblings is strongly predictive of the number of children the subjects have among Gypsies, but not among Hungarians (Figure 2).

Furthermore, the strength of that association proved to depend on the sex of helpers among Gypsies. This is not surprising, for we have formerly found a difference between male and female siblings in the readiness and willingness for helping activities. Sisters are more likely than brothers to help in childcare, and this sex-specific difference was expected to bring about a difference in reproductive output. Indeed, the correlation between the number of siblings and fertility mainly resulted from a correlation on the female side; the more sisters the subjects have, the more children they have (Spearman's  $\rho = 0.27$ ,  $p = .0242$ ). The number of brothers did not have a significant effect on fertility, although the results were in the predicted direction ( $\rho = 0.10$ ,  $p = .14$ ). Figure 2 shows the distribution of fertility for subjects having brothers and sisters below and above the average measured in the population

FIGURE 2. Fertility as a function of the number and the sex of the siblings.



(for sisters: 2.78, for brothers: 2.33). Subjects having two or fewer sisters ( $N = 95$ ) have an average of  $3.50 \pm 2.07$  children, whereas those with three or more sisters ( $N = 89$ ) have  $4.46 \pm 2.78$  offspring ( $U = 2.73, p = .0084$ ). These values for brothers are the following:  $N = 110, 3.80 \pm 2.32$  vs.  $N = 74, 4.21 \pm 2.68$  ( $U = 1.06, p = .27$ ).

## DISCUSSION

The difference in fertility between Gypsies and Hungarians is likely to be influenced by the difference in kinship network as a valuable resource. In the rural Gypsy population examined in the present study, many more close and distant relatives are available. They keep tighter and more intimate contact with each other, and they spend more time in helping activities related to direct childcare, compared to Hungarians. The personal services the relatives provide may decrease the costs of child-rearing and increase the likelihood of investing in another offspring. In fact, subjects having grandparents available for a longer period of time and those who have more sisters have more surviving children. Having more relatives available who are ready to help each other in childrearing and, therefore, decrease the parents' investment in own offspring, Gypsies can produce more children than Hungarians who lack nepotistic assistance as an essential resource. Because neither low education nor low occupational status has been found to be a main cause of high Gypsy fertility, it is plausible to argue that an abundance of assistance and services in the kinship group ensures a steady and high level of reproduction.

As a possible alternative explanation, it might be argued that it is not the personal services and assistance provided by the relatives that are responsible for high fertility but an identification with a model of large family that has a high value or function as a norm in a given culture. Children who are born into a large circle of kinship network will learn that a high number of children is expected in their society and a demand for high fertility will remain strong through generations. In other words, high fertility could be accounted for solely on the basis of the cultural transmission rules such as "Produce as many children as how many siblings you had during childhood." However, as stated previously, fertility is enhanced as a function of the number of sisters but not brothers among Gypsies. If fertility were simply a function of imitating the prevalent family model, no sex differences in kinship network would be expected to have an influence on the number of children.

Why is there no significant correlation between the number of siblings and offspring among Hungarians? In fact, some Hungarians have a relatively large circle of kinsmen, and personal services could be transformed into increased reproductive success. However, this is not what happens; fertility does not increase as a function of the number of siblings. I suggest that resource competition among siblings counterbalances the possible benefits resulting from nepotistic altruism in the Hungarian population. Agricultural land, residence, and breeding animals are valuable resources that Hungarian peasants traditionally inherit from their parents. Besides, parents habitually provide their children with money for completing their education, making successful marriages, and getting goods. The amount of resources possessed

by the parents is limited, and it has to be allocated among siblings. Therefore, the amount of resources each individual inherits will decrease as the total number of their siblings increases. As a consequence, competition for resources by siblings may account for the lack of relationship between fertility and family size. We do not know, at the moment, what types of resource allocation are involved: unequal distribution of parental care, education, or family inheritance, for example. We also do not know how birth order, and sex and age of children influence the process of allocation in our sample. All of these questions remain to be answered in future studies.

In contrast, Gypsies usually do not have inheritable resources. Given their traditional role in the division of labor, only a small minority of them cultivate land or breed animals, mainly for the immediate consumption by their family. Although the economic stratification has begun among them after the communist "egalitarianism" collapsed, only a few of them have managed to become wealthy, or at least well-to-do. The majority remain poor, and the rate of unemployment among them has even increased over the past several years, far exceeding that of the Hungarians. Apart from a few exceptions, Gypsy youths do not inherit money, house, land, breeding stock, or occupation from their parents. As a consequence, competition for resources is not an essential part of their behavioral repertoire. A lack of material assistance seems to be compensated for by direct childcare that involves helping activities provided by relatives other than parents. This relationship strongly corresponds to evolutionary theory predicting that a tradeoff occurs between mating effort and direct parental effort; males having a relatively small amount of inheritable resources spend more time and energy in raising children (Bereczkei et al. 1977; Hewlett 1988).

In spite of the strongly connected kinship groups among Gypsies, the nuclear family is a prevalent residential unit instead of the extended household systems characteristic of preindustrial societies. Kinship networks are established through cooperation among economically independent nuclear families. These facts suggest that intensive assistance among relatives does not necessarily go together with an extended family structure (Turke 1989). In other words, a strong reduction in family size in itself does not lead to a sharp decline in fertility, both of which are characteristic of societies following the demographic transition.

There is some historical evidence that the economic independence of the nuclear family predated the fertility transition in North-Western Europe (Laslett 1972). It is far from clear whether Gypsy populations in Eastern Europe are certain kinds of traditional societies or constitute an intermediate state between traditional and industrial societies, or have just crossed the threshold of demographic transition (Low 1994). Their fertility is higher than in the neighboring populations but lower as compared to preindustrial societies. This holds for mortality too; according to the data available about mortality rate during the first year after birth, Gypsy infants are 80% more likely to die than Hungarians, due to prematurity, developmental anomalies, and various other diseases (Horvath 1979). Although Gypsies' infant mortality rate (55–70 per thousand) exceeds that of industrial people, it falls behind mortality rates measured in more traditional societies. Both fertility and mortality rates seem to have been declining over the past century (Hooz 1991), but no exact data have been available recently about demographic variables of "historical" Gypsy populations.

The present study raises several questions that have to be answered by future research. First, is assistance with childcare for relatives channeled into the helpers' reproductive output? If this kind of helping behavior is an adaptive strategy, helpers are expected to increase their inclusive fitness through collateral branches of relatives. To answer this question, we should measure the net flows of altruism and the number of direct and indirect descendants spanning three generations. Different types of helping activities may have different cost and benefit consequences for helper, recipient child, and recipient parent that should be accounted for. For example, Davis (1997) has found that firstborn children strive for high status to a disproportionate degree than their younger siblings. The specific niche an individual offspring occupies, then, is more dependent on the number of older siblings still receiving parental care than on the number of younger siblings (Davis 1997).

Second, proximate mechanisms underlying reproductive strategies should be accounted for. Although no difference in oral birth control has been found in our sample, other kinds of contraception may be responsible for the fertility differences between the two ethnic groups. Factors such as mortality rates, abortion, and family composition (e.g., father absence) also may influence the measured values of reproduction (Belsky et al. 1991; Bereczkei and Csanaky 1996; Chisholm 1993). It is far from clear how direct childcare contributes to higher fertility among Gypsies. It is highly probable that helping behavior decreases the parents' investment in their own offspring and enhances their capacity for producing additional children. Besides, it may increase the children's survival capacity and decrease the mortality rates, or promote a relatively rapid development leading to an early sexual maturation (Belsky et al. 1991).

Third, more data are needed about the differences between Hungarians and Gypsies in resource allocation, intermale competition, sibling cooperation, and rivalry. A couple of studies have found that the degree of predictability and stability of the environment strongly influences decision-making mechanisms related to fertility (Bereczkei 1993; Chisholm 1993; Weinrich 1977). What is it about the ecological and social environment that makes it beneficial for ethnic Hungarians to consistently produce fewer offspring over many generations, and what makes it beneficial for Gypsies to increase the number of offspring in the current generation? This is one of the main questions that should be answered.

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