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The Relationship Between Cumulative Number of Cohabiting Partners and Number of Children for Men and Women in Modern Sweden

Anna Johanna Lindqvist Forsberg
and Birgitta S. Tullberg
Department of Zoology, Stockholm University, Sweden

Societies with institutional monogamy may be effectively polygynous through some males having several wives in succession: serial monogamy. This study investigates the relationship between the number of cohabiting partners and the number of children in a modern society where serial monogamy is common in both sexes. Data from an investigation on cohabitation and reproduction were provided by the Swedish Statistics Bureau, where the oldest cohort were used to estimated "lifetime" number of partners and children. The analyses were repeated for the next-to-oldest cohort. About 78% males and 79% females had one partner, and about 15% of both sexes had more than one partner during their reproductive lifespan in the oldest cohort. Thus, monogamy was predominant, and serial monogamy was equally common among men and women. Serial monogamy was somewhat more frequent in the next-to-oldest cohort. Remating increased the number of offspring for males, but not for females, in both cohorts. This is in accordance with the idea of serial monogamy being a conditional reproductive strategy for males in a society with institutional monogamy. However, the reproductive costs and benefits for females of remating are obscure. In the oldest cohort of males there were significantly more unskilled laborers with no partner and no children compared to other socioeconomic categories. The same pattern, however nonsignificant, was found for the next-to-oldest cohort and, according to SSB data, is strong when even younger age groups are included. Data on socioeconomic status for females were not provided.

KEY WORDS: Mating pattern; Serial monogamy; Sex differences; Socioeconomic category.

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Address reprint requests and correspondence to: Birgitta Tullberg, Department of Zoology, Stockholm University, 106 91 Stockholm, Sweden. E-mail: tullberg@zoologi.su.se

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In most mammalian species the male is larger than the female (e.g., Ralls 1976). This sexual dimorphism is believed to be a consequence of energetic and ecological factors, and most of all a polygynous mating system, as the relative male size and the potential number of females per male are positively correlated (Alexander et al. 1979; Clutton-Brock and Harvey 1977). Although these studies use species and genera, respectively, as independent datapoints in the analyses (inflating the degrees of freedom), the relationship between male-biased size dimorphism and polygyny seems to hold (Nylin and Wedell, 1994).

Among the anthropoid primates, where polygyny (including multi-male systems) predominates, monogamy is likely to have evolved at least seven times (Sillén-Tullberg and Møller 1993), and in most of the monogamous species the two sexes are equal in size. Humans, *Homo sapiens*, show sexual dimorphism, with males being 5%–12% taller than females (Alexander et al. 1979). Together with paleontological information on size dimorphism in the hominid lineage (e.g., Klein 1989), this implies a polygynous mating system in our evolutionary past. According to one estimate, 83.4% of all cultures are classified as being polygynous (Smith 1984), but depending on the measure of polygyny being used (Low 1988) the proportion of polygynous cultures may be even higher. Monogamy in various societies may be socially or ecologically imposed, that is, depending on societal rules or a harsh environment (Alexander et al. 1979; Brown and Hotra 1988).

There are indications that males living in societies with socially imposed monogamy, by remarrying and having several wives in succession (Lockard and Adams 1981; Smith 1984), may be effectively polygynous, giving rise to increased male variance in reproductive success (Bateman 1948; Daly and Wilson 1988). But in present Western societies, females as well as males adopt serial monogamy, that is, remarry/cohabit with more than one partner and may have children with different partners.

In this paper we compare the cohabitation pattern for males and females and its effect on reproduction in modern Sweden. We use data on cohabitation and number of children from the Swedish Statistics Bureau and ask whether this traditionally monogamous society is in effect polygynous, with males adopting a strategy of serial polygyny. We also ask whether there is a correlation between a male's socioeconomic status and the number of partners and children as often found in polygynous societies (e.g., Betzig 1986, 1988; van den Berghe 1979).

METHODS

Before and during the Middle Ages, there are indications about Sweden being a polygynous society (Lyttkens 1972), with a change to monogamy taking place with the turnover to Christianity in the 11th century. The modern Swedish society is characterized by a social distribution policy and a well-built social security system, which makes incomes and resources rather equally divided within the population.

The parish registration is extremely detailed and thorough in Sweden (see Clarke and Low 1992; Low 1989, 1990; Low and Clarke 1992), and it might be argued that this should be used to follow individuals and register children with every partner. However, the parish registration only contains marriage partners, not cohabiting partners, and would not provide the data for the purpose of this study because around 50% of all children are born outside marriage in modern Sweden (Hoem 1990).

In the 1970s the Swedish government had asked the Swedish Statistics Bureau (SSB) to investigate why fertility in Sweden was so low at the time. In 1981, a total of 4,257 females from 20 to 44 years old were interviewed about important aspects of their lives with special emphasis on cohabitation and reproduction (SSB 1984). In 1985, a total of 3,171 males from 20 to 48 years old filled in a mail questionnaire on the same subjects (SSB 1990). The male survey is unique in itself; there are not many surveys of this kind on behavior related to reproduction in males.

Participation was voluntary in both surveys. The individuals were chosen from the register of the total population in Sweden. In order to participate, a person had to be born in Sweden. The females were interviewed by female interviewers. The interviewees were asked questions from a questionnaire, from which they had to choose one out of several alternative answers. Test interviews were organized to train the interviewers and test the questions. The males were sent questionnaires by mail, and these questionnaires had also been tested before use. Eighty-seven percent of the females and 79% of the males chosen for the surveys finally participated. The dropout was largest in the older, unmarried cohorts with no children.

The answers were controlled both manually and by a special computer program designed to find illogical and inconsistent answers in surveys. The systematic errors that cause problems in this survey are (1) the selective dropout that results in a rise of the mean number of partners and number of children for the older cohorts and (2) the possibility of the test subjects giving false answers or withholding information. Also, the participation in the male survey is low compared with the minimum limit of participation of 85% that has been set in order to be able to rely on the results.

We were provided with data on the number of cohabiting partners and the number of children for each sex, along with socioeconomic status for the males only. The males taking part in the SSB survey were put into six different socioeconomic categories, depending on their occupation. The different categories were based on number of years of education which reflects the income level: unskilled laborer, skilled bluecollar worker, whitecollar worker, midlevel manager, management, and self-employed. We chose to concentrate on the oldest cohort categorized by SSB, consisting of 492 females, 40–44 years old, and 375 males, 45–48 years old, because we were interested in comparing male and female lifetime reproductive success. We consider this as a relatively good estimate of lifetime reproduction (but see Discussion). Fourteen males in this cohort listed their oc-

cupation as unspecified, and they were excluded from the socioeconomic category analyses. We also analyzed the cohort just below the oldest one in order to see whether the patterns found for the oldest cohort are repeated. Individuals in this cohort, consisting of 1,002 females, 35–39 years old, and 532 males, 40–44 years old, are of course generally farther from their lifetime reproduction. Twenty males in this cohort listed their occupation as unspecified and were consequently excluded from the socioeconomic category analyses.

The male data were available on PC (personal computer) for analysis, but the female data had been stored in a database not easily attainable for PC analysis. This made it impossible to get information about how many children the females had at most. We did get information about how many individuals had 0, 1, and 2 children, but the ones with 3 or more children had been lumped together in one category. The same circumstances were also true for number of partners. In order to be able to compare the two surveys, we pooled the values for males in the same way as had been done for the females, so that males with 3 or more children were put in the same category. The males had at most 7 children.

Under a polygynous mating system one would expect greater variance in male than in female number of partners and children, but because the data consisted of pooled values, we were not able to use parametric methods of analysis. Instead, we used nonparametric methods. However, in the analyses of socioeconomic status among the males, where no comparison was made between the sexes, we used both types of statistical analyses.

RESULTS

Starting with the oldest cohort, almost 80% of both males and females had one cohabiting partner, and about 15% of both sexes had two or three partners during their reproductive years (Table 1). There was no significant difference between males and females in the distribution with respect to the number of partners, $\chi^2 = 1.81$, $p = .61$, $DF = 3$, and there was no difference between males and females in the frequency of individuals that never had a partner, $\chi^2 = 1.787$, $p = .18$, $DF = 1$ (Table 1). Because we did not get access to the exact number of children for individual females with three or more children, we pooled the corresponding male categories as well and found no overall difference between males and females in distribution with respect to number of children, $\chi^2 = 4.25$, $p = .24$, $DF = 3$ (Table 1). About 40% of both males and females had two children, and almost 30% of each sex had three or more children. We did, however, find that there were significantly more males than females with no children at all, $\chi^2 = 4.02$, $p = .045$, $DF = 1$ (Table 1).

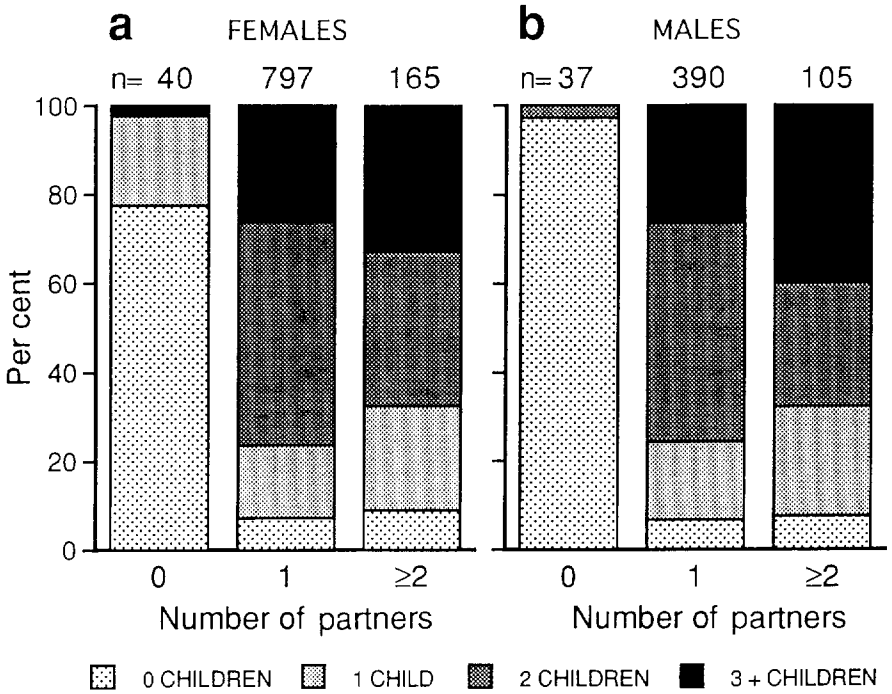
Individuals, both males and females, that had three partners during their reproductive lifespan were few, so we pooled all individuals with two or more partners into one category to analyze whether the number of children is independent of the number of partners. In effect, we ask whether having more than one cohabiting partner influences the number of children.

Table 1. The Distribution of the Relative Frequency of Males (n = 375) and Females (n = 492) in the Oldest Cohort with Respect to the Cumulative Number of Partners and Number of Children

	Males		Females	
Number of partners				
0	7.7%		5.5%	
1	77.6%		79.1%	
2	13.1%		13.8%	
⩾3	1.6%		1.6%	
	100%		100%	
Number of children				
0	16.5%		11.8%	
1	13.7%		15.4%	
2	40.8%		43.1%	
3	21.1%		?	
4	6.1%	29.0%	?	29.7%
5	1.3%		?	
6	0.5%		?	
	100%		100%	

There was no difference in the number of children between females with one and females with two or more partners, $\chi^2 = 3.07, p = .38, DF = 3$ (Figure 1a). Neither was there any difference between these groups of females in the frequency of having three or more children, $\chi^2 = 0.04, p = .85, DF = 1$. For males,

FIGURE 1. Relative frequencies of number of children with respect to the cumulative number of cohabiting partners for the oldest cohort of (a) females (n = 492) and (b) males (n = 375). Individuals with more than one partner and with more than two children have been pooled.



however, the number of children was not independent of whether there had been one or more partners, $\chi^2 = 13.92$, $p = .03$, $DF = 3$ (Figure 1b). This difference is due to a higher frequency having three or more children in the category with more than one partner, $\chi^2 = 11.41$, $p = .0007$, $DF = 1$ (Figure 1b). In conclusion, having more than one cohabiting partner increased the likelihood of having more children for males but not for females.

The above analyses did not include the category with zero partners. It is interesting to note, however, that 18.5% of females in this category had one or two children, whereas only 3% of the males had any child (Figure 1).

The same analyses as above were performed for the next-to-oldest cohorts. Table 2 shows that the frequency of individuals with more than one cohabiting partner is higher in relation to individuals having one partner than in the oldest cohort (Table 1). In the next-to-oldest cohort there was a significant difference between males and females in the distribution with respect to the number of partners, $\chi^2 = 9.94$, $p = .02$, $DF = 3$ (Table 2). More males than females did not have any partner at all, $\chi^2 = 6.40$, $p = .01$, $DF = 1$, but there was no significant difference between the sexes in the proportion of individuals having more than one partner, $\chi^2 = 2.56$, $p = .11$, $DF = 1$. There was no significant difference between the sexes with respect to the distribution of the number of children in this cohort, $\chi^2 = 2.45$, $p = .48$, $DF = 3$ (Table 2).

In this cohort there was a significant difference in the number of children between females with one and females with two or more partners, $\chi^2 = 13.29$, $p = .004$, $DF = 3$ (Figure 2a). This heterogeneity is due to a significant difference in the frequency of having one or two children, so that more females with one partner had two children and more females with two or more partners had one child, $\chi^2 = 5.88$, $p = .01$, $DF = 1$ (Figure 2a). There was no significant difference between these groups of females in the frequency having three or more

Table 2. The Distribution of the Relative Frequency of Males ($n = 532$) and Females $n = 1,002$) in the Next-to-Oldest Cohort with Respect to the Cumulative Number of Partners and Number of Children

	Males		Females	
Number of partners				
0	7.0%		4.0%	
1	73.3%		79.5%	
2	17.3%		14.4%	
⩾3	2.4%		2.1%	
	100%		100%	
Number of children				
0	13.2%		11.0%	
1	17.8%		18.0%	
2	41.7%		45.0%	
3	19.5%		?	
4	6.2%		?	
5	1.1%	27.3%	?	26.0%
6	0.2%		?	
7	0.2%		?	
	100%		100%	

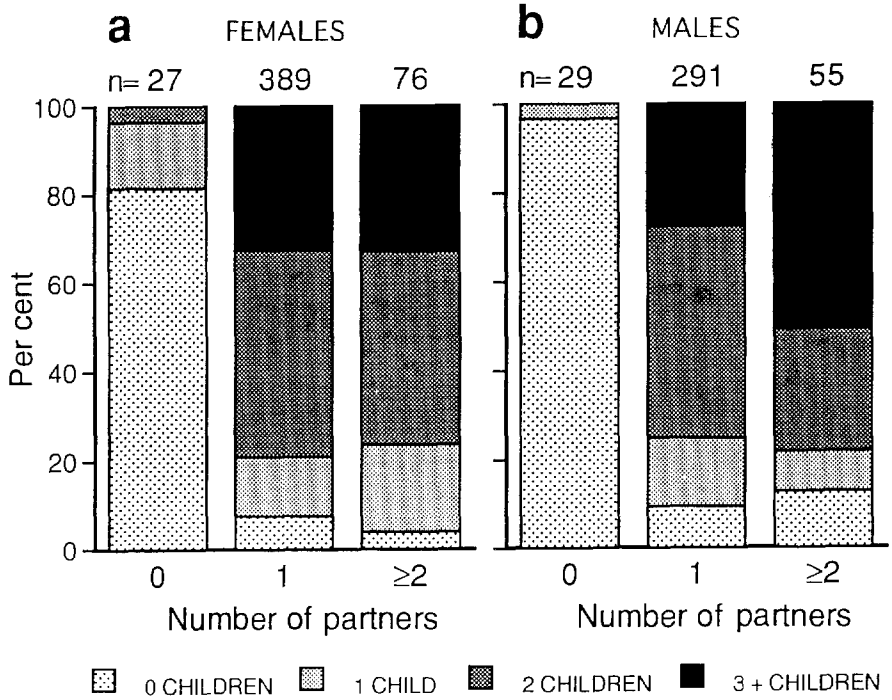


FIGURE 2. Relative frequencies of number of children with respect to the cumulative number of cohabiting partners for the next-to-oldest cohort of (a) females (n = 1002) and (b) males (n = 532). Individuals with more than one partner and with more than two children have been pooled.

children, $\chi^2 = 2.68$, $p = .10$, $DF = 1$ (Figure 2a). For males, the pattern found for the oldest cohort was replicated, in that there was a significant difference in the number of children between males with one and males with two or more partners, $\chi^2 = 16.13$, $p = .001$, $DF = 3$ (Figure 2b), and that more males with two or more partners than males with one partner had three or more children, $\chi^2 = 7.38$, $p = .007$, $DF = 1$ (Figure 2b).

An analysis of variance of the number of partners among the six different socioeconomic categories in the oldest cohort gave a significantly result, $F = 2.39$, $p = .04$, $DF = 360, 5$ (Table 3). Also, a nonparametric analysis of the dis-

Table 3. Cohabitation Pattern and Number of Children for the Oldest Male Cohort (45–48 years) Divided into Six Socioeconomic Categories (n = 361)

Socioeconomic category (n)	Number of partners $\bar{x}$ (SD)	Proportion with no partner (%)	Number of children $\bar{x}$ (SD)	Proportion with no children (%)
Unskilled laborer (55)	0.93 (0.72)	27.3	1.44 (1.24)	36.4
Skilled bluecollar (76)	1.16 (0.52)	2.6	1.91 (1.01)	14.5
Whitecollar worker (46)	1.02 (0.49)	10.9	1.76 (1.06)	17.4
Midlevel manager (76)	1.21 (0.52)	2.6	1.95 (0.92)	10.5
Management (62)	1.10 (0.39)	3.2	1.90 (0.95)	9.7
Self-employed (46)	1.09 (0.28)	0	1.90 (0.92)	13.0

Table 4. Cohabitation Pattern and Number of Children for the Next-to-Oldest Male Cohort (40–44 years) Divided into Six Socioeconomic Categories (n = 512)

Socioeconomic category (n)	Number of partners $\bar{x}$ (SD)	Proportion with no partner (%)	Number of children $\bar{x}$ (SD)	Proportion with no children (%)
Unskilled laborer (86)	1.14 (0.67)	11.6	1.94 (1.37)	17.4
Skilled bluecollar (124)	1.14 (0.65)	8.1	1.90 (1.20)	14.5
Whitecollar worker (51)	1.10 (0.54)	9.8	2.02 (1.17)	11.7
Midlevel manager (100)	1.10 (0.48)	7.0	1.85 (0.91)	11.0
Management (82)	1.30 (0.78)	3.7	1.96 (1.07)	8.5
Self-employed (69)	1.28 (0.66)	1.5	1.97 (1.21)	14.5

tribution of number of partners (0–3) with respect to socioeconomic category was significant, $\chi^2 = 54.58, p = .0000, DF = 15$. This difference is not an effect of the frequencies of individuals with one, two, or three partners, $\chi^2 = 10.77$, $p = .37$, $DF = 10$, but due to a difference in frequency of individuals without a partner, $\chi^2 = 43.86, p = .0001, DF = 5$ (Table 3). There are more noneducated workers that never had a partner compared to the other categories when these have been pooled, $\chi^2 = 39.11$, $p = .0000$, $DF = 1$.

An analysis of variance of the mean number of children between the socioeconomic categories gave a nonsignificant result, $F = 2.07, p = .068, DF = 360, 5$ (Table 3). However, a nonparametric analysis showed that the number of children (categories 0, 1, 2, 3–6) is not independent of socioeconomic category, $\chi^2 = 38.29, p = .02, DF = 15$. We asked whether the heterogeneity found depends on a difference in the number of children among individuals with children. Thus, we compared the categories 1, 2, and 3–6 children but found no significant difference between these, $\chi^2 = 8.74, p = .56, DF = 10$. We found, however, that the frequency of individuals with and without children was not independent of socioeconomic category, $\chi^2 = 20.62, p = .001, DF = 5$ (Table 3). There were more noneducated workers that did not have any children at all compared to the other categories, $\chi^2 = 19.02, p = .001, DF = 1$).

The above results for the oldest cohort of males were not repeated when the next to oldest cohort was considered. For instance, there was no heterogeneity among the socioeconomic categories with respect to number of partners, $\chi^2 = 17.30, p = .30, DF = 15$, or number of children, $\chi^2 = 13.59, p = .55, DF = 15$ (Table 4). The average number of partners and of children in the lowest socioeconomic category are also higher for the next-to-oldest (Table 4) than for the oldest cohort (Table 3). Also, the proportions of individuals without a partner and without children among unskilled laborers are lower; however, these proportions are still the highest among the categories within the cohort (Tables 3 and 4).

DISCUSSION

In both of the cohorts investigated, the majority of individual males and females had one cohabiting partner, making strict monogamy the general cohabitation

pattern in modern Sweden. In the oldest cohort the frequency of having more than one partner is about 15% for both sexes, and in the next-to-oldest cohort 19.7% of the males and 16.5% of the females had more than one partner. Thus, there is a slight increase in the incidence of serial monogamy, but more data over a longer time period have to be collected in order to evaluate whether this represents a general trend. In both of the cohorts there were more males than females without a cohabiting partner, but this was only significant for the next-to-oldest cohort.

In an effectively polygynous society, one would expect the variance in reproductive success to be higher in males than in females. Unfortunately, we could not compare variances because of the pooled data sets for the females. In the oldest cohort there were significantly more males than females without children, and the same trend was seen in the next-to-oldest cohort. This might partly be explained by the sex ratio that is slightly male-biased in all age categories up to 50 years of age (SSB 1987), a factor not compensated for in the study. But the difference in childlessness in the two sexes may also reflect the fact that paternity is less certain than maternity. Males may have more offspring than they are aware of, or, for that matter, fewer. Thus, paternity uncertainty is a general source of error in this and other studies not using, for instance, fingerprinting techniques.

The question of paternity is also highlighted when considering the rather high frequency of females that have children without having had any cohabiting partner at all. As we see it, there are three potential groups of fathers to such children with respect to the SSB survey: Men who have (1) not reported their fatherhood, possibly because of unawareness, (2) reported the fatherhood but have never lived together with any woman, and (3) reported the fatherhood but have lived with one or several women other than the mother. The 3% of males with children but without cohabitating partners imply that at least some fathers belong the second category, but unfortunately the SSB survey does not give a clue as to the frequency of the third situation; the males in the survey were asked to report their biological children in the questionnaire, but not specifically asked to report all, for example, "illegitimate," children. Therefore, it is difficult to estimate the relative frequency with which the children of noncohabiting mothers can be ascribed to the three categories of males.

There are other sources of errors and unknown variables in our study. First, considering the two SSB surveys, they are intended to shed light on the reproductive patterns of the two sexes in Sweden. The surveys are meant to be compared to cover the whole "reproductive scenario," but the question is how comparable they are. They were made with different sampling methods—interview versus questionnaire—and the participation frequency was low in the male survey. The male survey only includes males up to the age of 48. According to SSB's own statistics, males in Sweden have children at an age older than that. In 1986, for example, 0.7% of children born in a marriage setting had a father that was 49 years or older (SSB 1987). Comparatively, there are very few children born with fathers older than 49 years of age, and this is the reason why the male survey did not include older males. The female survey is likely to cover more of lifetime

reproduction, though, because in 1986 only 0.07% of children born in a marriage setting had a mother aged 45 or older (SSB 1987).

A central finding in the present study is that males increased their number of children when having more than one partner, whereas no such effect was found for females. This is consistent with the pattern found in some Swedish parishes during the 19th century, the difference between then and now being that remarriage was then very uncommon among women (Low 1989, 1990). Our society, with the low birth rate characteristic of modern Western societies and with serial monogamy instead of polygyny, shows the same pattern – the more wives, the more children – as traditional societies (e.g., Borgerhoff Mulder 1988; Chagnon 1979; Irons 1979) where people live closer to their reproductive potential. Thus, we may regard serial monogamy as a conditional reproductive strategy for males in our society.

In traditional societies social status and resources are conducive to polygyny and hence to reproduction, and Scandinavian demographic data from the 18th and 19th centuries generally show an impact of wealth on family size (Low 1994; Low and Clarke 1992; Røskaft, Wara, and Viken 1992). In the present study we did not find that males in higher socioeconomic categories "remarried" more often than males in lower categories. However, in the oldest cohort we found that the proportion that had not cohabited or that were without children were significantly higher among unskilled laborers than among the higher socioeconomic categories. In the next-to-oldest cohort the same trend was found, but it was much less pronounced and not significant. We may thus ask whether there is a trend toward less influence of low socioeconomic status for the younger cohorts. However, taking a larger sample of males into consideration, SSB (1990, p. 75) concludes, "Among unskilled workers almost 25 percent of the men had never been married or cohabiting at the age of 30. For professionals the corresponding proportion is only 10 percent. The socioeconomic gradients are strong. . . . " It should be mentioned that, in this comparison made by SSB, the next highest proportion of individuals without partner, 18%, belonged to the category "whitecollar worker."

Our results show that the frequency of "remarriage" tends to be similar between the sexes, but whereas males increase the number of offspring when having more than one partner, females do not. However, although the present study does not show any increase in reproduction for women having more than one partner, reproductive effects may nevertheless exist, but might as well be costly as beneficial. For instance, living with a stepfather seems to be one of the greatest risk factors for a child's well-being (Daly and Wilson 1988). Also, a study from a Caribbean village implies that a stable marriage, by having a resident father, increases the fitness of sons (Flinn 1988). On the other hand, in Western societies reproductive costs and benefits of remarriage may vary depending on the socioeconomic status of the female. Van den Berghe and Whitmeyer (1990) present data from the 1980 U.S. Census, showing that females with the highest incomes had an increased probability of remarriage, but eventual effects of remarriage on reproduction in different income categories were not mentioned.

It would be interesting to find out how socioeconomic category is related to both number of partners and reproduction for women in our sample. Hoem (1990) looked at the mean number of children per woman in three different education classes, depending on number of years of education, and found that women in the lowest education class had the highest mean number of children. However, Rank (1989) found that, in a U.S. population, the poorest women had a fertility rate below that of the general population. Thus, the relationship between socioeconomic level and fertility for women in Western societies may very well be nonlinear, fertility being highest at some middle level, as suggested by Low (1994) (but see Essock-Vitale 1984).

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REFERENCES

Alexander R.D., Hoogland, J.L., Howard, R.D., Noonan, K.M., and Sherman, P.W. Sexual dimorphism and breeding systems in pinnipeds, ungulates, primates, and humans. In *Evolutionary Biology and Human Social Behavior: An Anthropological Perspective*, N.A. Chagnon and W.G. Irons (Eds.). North Scituate, MA: Duxbury Press, 1979, pp. 402–435.

Bateman, A.J. Intrasexual selection in *Drosophila*. *Heredity* 2:349–368, 1948.

Betzig, L.L. *Despotism and Differential Reproduction: A Darwinian View of History*, Hawthorne, NY: Aldine, 1986.

Betzig, L.L. Mating and parenting in a Darwinian perspective. In *Human Reproductive Behaviour: A Darwinian Perspective*, L. Betzig, M. Borgerhoff-Mulder, and P. Turke (Eds.). Cambridge: Cambridge University Press, 1988, pp. 3–20.

Borgerhoff Mulder, M. Reproductive success in three Kipsigis cohorts. In *Reproductive Success*, T.H. Clutton-Brock (Ed.). Chicago: University of Chicago Press, 1988, pp. 419–435.

Brown, D.E., and Hotra, D. Are prescriptively monogamous societies effectively monogamous? In *Human Reproductive Behaviour: A Darwinian Perspective*, L. Betzig, M. Borgerhoff-Mulder, and P. Turke. (Eds.). Cambridge: Cambridge University Press, 1988, pp. 153–159.

Chagnon, N.A. Is reproductive success equal in egalitarian societies? In *Evolutionary Biology and Human Social Behavior: An Anthropological Perspective*, N.A. Chagnon and W.G. Irons (Eds.). North Scituate, MA: Duxbury Press, 1979, pp. 374–401.

Clarke, A.L., and Low, B.S. Ecological correlates of human dispersal in 19th century Sweden. *Animal Behavior* 44:677–693, 1992.

Clutton-Brock, T.H., and Harvey, P.H. Primate ecology and social organization, *Journal of Zoology* 183:1–33, 1977.

Daly, M., and Wilson, M. *Homicide*. New York: Aldine de Gruyter, 1988.

Essock-Vitale, S. The reproductive success of wealthy Americans. *Ethology and Sociobiology* 5:45–49, 1984.

Flinn, M.V. Parent-offspring interactions in a Caribbean village: daughter guarding. In *Human Reproductive Behaviour: A Darwinian Perspective*, L. Betzig, M. Borgerhoff-Mulder, and P. Turke (Eds.). Cambridge: Cambridge University Press, 1988, pp. 189–200.

Hoem, B. *Do All Good Things Come in Three? Third Births to Swedish Women Born in 1936–50.* Stockholm Research Reports in Demography, No. 59, 1990.

Irons, W.G. Cultural and biological success. In *Evolutionary Biology and Human Social Behavior: An Anthropological Perspective*, N.A. Chagnon and W.G. Irons (Eds.). North Scituate, MA: Duxbury Press, 1979, pp. 257–272.

Klein, R.G. *The Human Career: Human Biological and Cultural Origins*, Chicago: University of Chicago Press, 1989.

Lockard, J.S., and Adams, R.M. Human serial polygyny: demographic reproductive, marital, and

divorce data. *Ethology and Sociobiology* 2:177–186, 1981.
Low, B.S. Measures of polygyny in humans. *Current Anthropology* 29:189–194, 1988.
Low, B.S. Occupational status and reproductive behavior in nineteenth-century Sweden: Locknevi parish. *Social Biology* 36:83–101, 1989.
Low, B.S. Occupational status, landownership, and reproductive behavior in 19th century Sweden: Tuna parish. *American Anthropologist* 92:457–468, 1990.
Low, B.S. Men in the demographic transition. *Human Nature* 5:223–253, 1994.
Low, B.S., and Clarke, A.L. Resources and the life course: patterns through the demographic transition. *Ethology and Sociobiology* 13:463–494, 1992.
Lyttkens, A. *Kvinnan Finner en Följeslagare*, Stockholm: Bonniers, 1972.
Nylin, S., and Wedell, N. Sexual size dimorphism and comparative methods. In *Phylogenetics and Ecology*, P. Eggleton and R. Vane-Wright (Eds.). London: Academic Press, 1994, pp. 253–280.
Ralls, K. Mammals in which females are larger than males. *Quarterly Review of Biology* 51:245–276, 1976.
Rank, M.R. Fertility among women on welfare: incidence and determinants. *American Sociological Review* 54:296–304, 1989.
Røskaft, E., Wara, A., and Viken, Å. Reproductive success in relation to resource-access and parental age in a small Norwegian farming parish during the period 1700–1900. *Ethology and Sociobiology* 13:443–461, 1992.
Sillén-Tullberg, B., and Møller, A.P. The relationship between concealed ovulation and mating systems in anthropoid primates: a phylogenetic analysis. *American Naturalist* 141:1–25, 1993.
Smith, R.L. Human sperm competition. In *Sperm Competition and the Evolution of Animal Mating Systems*, R.L. Smith (Ed.). New York: Academic Press, 1984, pp. 601–659.
Swedish Statistical Bureau. *Women and Children: Interviews with Women about Family and Work*, Stockholm: Official Statistics of Sweden, 1984.
Swedish Statistical Bureau. *Population Changes 1986, Part 3: The Whole Country and the Counties, etc.* Stockholm: Official Statistics of Sweden, 1987.
Swedish Statistical Bureau. *Men and Children: The Family-Formation among Swedish Males and Their Plans for Children. Results from a Mail Questionnaire*, Stockholm: Official Statistics of Sweden, 1990.
van den Berghe, P.L. *Human Family Systems*, New York: Elsevier Press, 1979.
van den Berghe, P.L., and Whitmeyer, J. Social class and reproductive success. *International Journal of Contemporary Sociology* 27:29–49, 1990.