

# SOME DEMOGRAPHIC ASPECTS OF THE CANELA INDIANS OF BRAZIL

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## Introduction

The Canela are Gê-speaking Indians who live in the *município* of Barra do Corda in the center of Maranhao state. This location places them in sandy cerrado countryside just east of the Amazon River watershed and just west of the dry Northeast of Brazil (see Figure 1). There were originally three tribes referred to as "Canela," but the third of these groups, the Kenkateye, was disbanded in 1913, following an attack by local ranchers who killed most of the adult males, leaving only the Ramkokamekra and Apanyekra. The smaller Apanyekra-Canela group numbered about 250 by the mid-1970s. They live in the village of Porquinhos, which is 50 kilometers west of the larger Canela village of Escalvado. This study focuses on the larger group, the Ramkokamekra-Canela living in Escalvado.

Although the all-too-familiar trauma of pacification had reduced the Canela population to below 100 by 1840, the Canela have been relatively fortunate compared to other tribes. The Canela have survived 240 years of contact since 1750 because they were so situated geographically that they could evade the principal pioneer thrusts by escaping to the north into their hills, because no rivers or highways facilitated outsiders' access, and because no valuable resources on their land tempted Brazilian settlers. The Canela benefited from a century of relatively light contact with settlers between 1840 and 1940, when they were able to adjust to the settlers so that their population numbers gradually increased. They were not forced into rapid change during this period, partly because settlers could live only on streams far enough apart to provide the Canela with sufficient living space. The Canela had time to evolve a gratifying post-pacification adaptive culture. This culture has been amply documented by the German-born Brazilian anthropologist Curt Nimuendajú and by Crocker in his monograph *The Canela (Eastern Timbira), I: An Ethnographic Introduction (1990)*. The Canela suffered a major set back in 1963, however, when a messianic movement led them to provoke the surrounding backlanders with large-scale thefts of cattle. The prophetess leading the movement demanded ever-increasing amounts of cattle for feasting. The backlanders mounted an attack on the Canela, which would have eliminated them if they had not been saved by a few brave Brazilian officials. The Canela were moved to the Guajajara Indian reservation at Sardinha for their own

protection. The dense dry forests of the reservation affected hunting and farming conditions, and even the sanitation practices of the tribe. A period of demoralization and disease followed. Our study begins when the Canela had returned to their homelands, and analyzes population change from 1970 to 1988.

The data for this study comes entirely from a series of censuses done by Crocker over the years he was in the field with the Canela. This research centers on the 1970 census, the only official one, as it was conducted for the Brazilian equivalent of the Census Bureau, the IBGE, but uses information collected in 1975, 1979, and 1988. The census manuscripts, with their rich information on kinship, as well as considerable basic demographic information on age, sex, relationships within the household, residence, marital status, fertility histories, and so on, were coded and analyzed by Greene.

The 1970 census was taken on the first of September of that year so that it would be consistent with the census taken in the rest of the country. For the 1970 census, Crocker was instructed by local IBGE personnel in Barra do Corda to take the fertility histories of one in three women, but he took somewhat more than that, adding up to about 40 percent of women in their reproductive years. The censuses for 1975 and 1979 were also taken as of the first of September. The 1988 census was taken by the Indian agent over a longer time period.

Our study traces some of the population changes the Canela underwent over the period of nearly twenty years, between 1970 and 1988. The 1960s, with the ranchers' attack and the forced move to Sardinha, was a disastrous period for the Canela. In this decade the population actually decreased slightly. After the return from exile in the late 1960s, the group began to increase in size, and their overall numbers changed from 437 in 1970 to 836 in 1988. The dramatic growth rate of the 1970s appears to have been maintained during the late 1980s at a level of nearly 4 percent.

Matrilocal and matrilineal among the Canela have important implications for the status of women, an intangible concept that demographers recognize as influencing fertility, child survival, and household resource allocation (Caldwell and Caldwell 1987). The rationale is that women who are able to control household resources increase the chances of

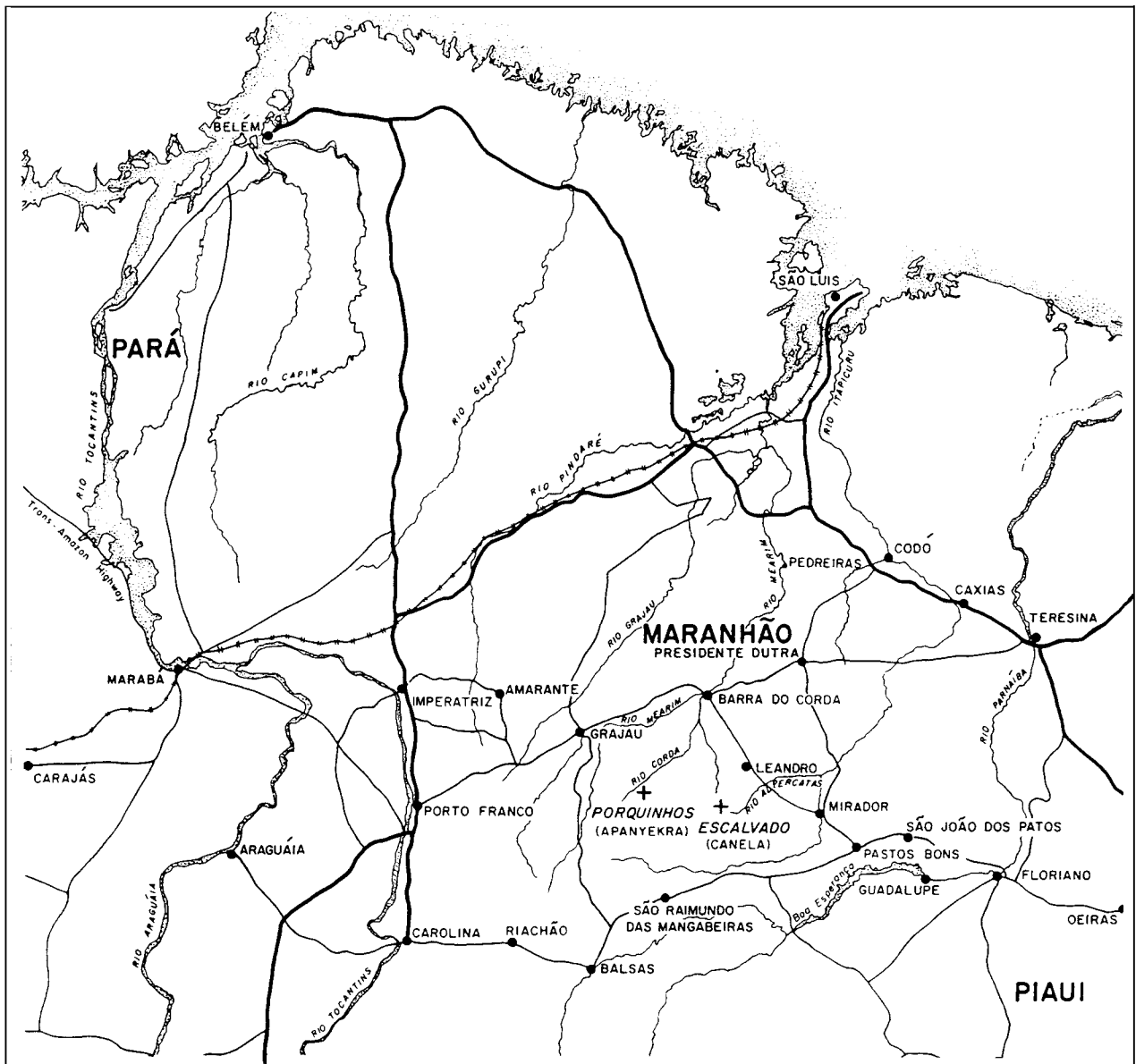


Figure 1.  
Maranhão and Neighboring States, Showing the Canela Region

survival of their children. We will see how this may play into the Canela demographic experience.

Probably as a result of a decline in mortality, particularly among infants and children, the Canela age distribution became increasingly “young” over the period of study, with larger and larger proportions at the youngest ages. Between 1970 and 1979, age at marriage increased for both men and women, but the several-year age gap between husband and wife remained fairly stable. The lack of substantial change in fertility patterns actually reflects a combination of factors that may have canceled each other out: a decline in breast feeding and improvements in health and nutrition, which would increase fertility, and a decline in extramarital sex and an increase in the age at marriage, which would decrease fertility.

The main change of note was the decline in overall mortality and child and maternal mortality in particular. The crude death rate fell from 53 deaths per 1000 for the period 1970-1975, to 29 deaths per 1000 population for 1975-1979. This decline was concentrated heavily among women, and the explanation that Crocker offers is that the combination of the eradication of tuberculosis and general improvement of medicine had an especially beneficial effect on women in their childbearing years. The child survival curves also show a dramatic decline in mortality, particularly between 1975 and 1979. The reduction of dysentery and infectious disease through the efforts of Sebastião, an agent of the Indian service, was almost certainly the major contributing factor to this trend.

## Population Size and Age Distribution

Before 1700 and the destructive contact with European settlers, the Canela probably numbered between one and two thousand, all living in one village. Reports about Canela population in the last century are unreliable, but the small size of 19<sup>th</sup> century village sites, a dozen of which Crocker visited and measured during the late 1950s, leads us to believe that the numbers were low. While the villages were consistently smaller in diameter and the house sites fewer, more individuals lived in each house. Crocker's guess is that the Canela population dipped well below 100 during the early to middle part of the last century, but that since 1840, with the geographic stabilization of the tribe, the number has been growing. During and since the time of Nimuendajú, reliable counts are available. In 1936, a year after a smallpox epidemic, there were about 300 Canela (Nimuendajú 1946:33), and for the next 24 years their numbers grew, slowly but steadily, to about 412. Their forced stay in the dry forest of the Guajajara Indian reservation after the messianic movement and the attack by ranchers reduced them to about 397 in 1969 (Crocker 1972:239). Indian service personnel found the numbers of Canela lower than before the move, and the Canela themselves kept saying that they were dying because of the living conditions in the forest. Indeed, their morale was very low, they were listless, and many preferred semi-starvation to working. After moving home, their population increased dramatically between 1969 and 1979 (to about 600) as a result of increased confidence and better medicine. It reached 836 in 1988 according to a census and list of names produced by the local Indian agent. These trends are summarized in Table 1.

The Canela, and other groups for whom the calendar is not very important, present a special challenge to the task of recording age. As early as the late 1950s, Crocker reconstructed a history of various old villages with the

intention of creating a series of benchmarks (see the Canela timeline, p. 61). The Canela shifted village sites about every five years. Among the most important early dates were the joining of the Cakamekra and Canela (1900), the fighting against the Guajajara (1901), the killing of the Kenkatéye (1913), and the great drought (1915). Individuals were asked questions such as: "since you say you came with the Cakamekra when they joined the Canela, how big were you then? Did your mother say she carried you, or did you walk from Mucura?"

For the period between 1915 and 1929 Crocker turned to the sequence of important social events: 1923, for example, was the end of an age-set cycle, a ten-year cycle of rituals and traditions for each cohort. Moreover, different kinds of festivals were held in different villages, so the question of how many and which festivals were remembered for each village site was also useful. Other events to remember were the festivals that occurred during the eight-year period during which Nimuendajú spent six summers among the Canela (1929-1936). Indian agents began to be a presence among the Canela starting in 1938, so it was possible to ask whether Senhor Olímpio or Dona Nazaré was living at the post at the time of a birth, for example. Two other important fixed points were the death of an old chief in 1951, and the arrival of Crocker himself in 1957.

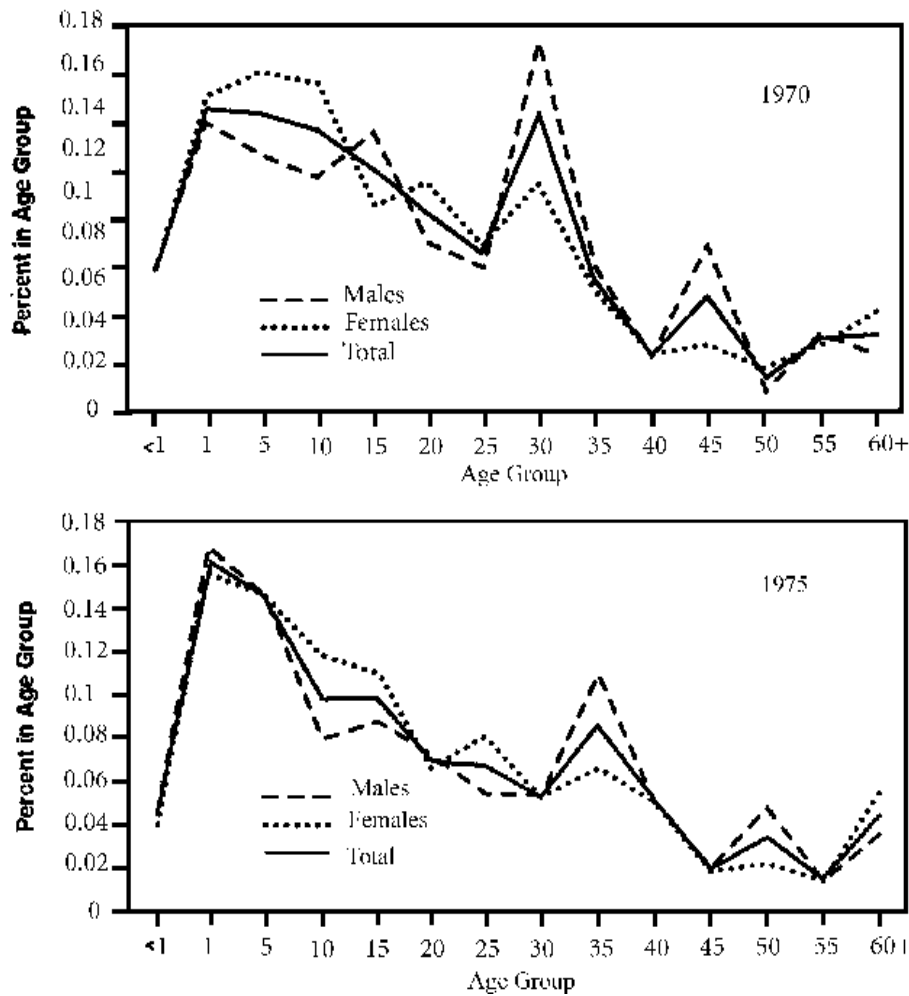
A result of this method of estimating age is that Crocker gives ages of older people in approximate terms of years rather than dates. With births since 1970 more exact information is known, as most dates were recorded by Crocker or the Indian agent. One way of seeing how reasonable the estimates of age are, particularly for older people, is to examine the age distribution of men and women in the tribe. Figures 2a-2d present the Canela population size and age distribution by sex in 1970, 1975, 1979, and 1988. Note the increasing smoothness of these age distributions in each subsequent year, indicating a greater accuracy in reporting ages with passage of time. For the later censuses, Crocker was building on age information he had collected earlier, as well as documenting births that had taken place since his arrival.

Two main characteristics call for our attention in these graphs. The first is the high proportion at the youngest ages, and the change in shape of this portion of the curve. The population in 1970 is fairly young, but in 1975 we see a clear increase in the proportion of the population made up by infants and young children (which could result from more births and their survival). In 1979, there are still many young children, and in 1988 we see the continuation of this trend, with consistently high proportions from ages 0 to 10. This suggests that during this later period children's chances of survival increased, surely due to better health care. Note the corresponding relative dearth of older people in the population, particularly in 1988.

**Table 1.**  
**Overall Population Size and Growth Rates**

<b>Year</b>	<b>1936</b>	<b>1960</b>	<b>1969</b>	<b>1970</b>	<b>1975</b>	<b>1979</b>	<b>1988</b>
<b>Total</b>	<b>@300</b>	<b>@412</b>	<b>397</b>	<b>437</b>	<b>508</b>	<b>600</b>	<b>836</b>
<b>Females</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>219</b>	<b>256</b>	<b>291</b>	<b>421</b>
<b>Males</b>	<b>—</b>	<b>—</b>	<b>—</b>	<b>218</b>	<b>252</b>	<b>309</b>	<b>415</b>
<b>Period Growth Rate</b>	<b>.023</b>	<b>-.002</b>	<b>.048</b>	<b>.030</b>	<b>.042</b>	<b>.037</b>	

Figures 2a and 2b  
 Populations Age Distribution by Sex and Five-Year Age Groups in 1970 and 1975



Other features of note in these graphs are the peaks in the population at ages 30-34 and 45-49 in 1970. We can follow these peaks in 1975, when at ages 35 and 50, somewhat lower peaks are observed, and in 1979, when age 30-40 is still slightly higher than the surrounding ages. By 1988, these bumps are gone altogether. The most likely explanation for these anomalies is that adults who did not know their ages related themselves to a memorable event, thereby heaping their ages on a particular year. Additionally, it was Crocker's tendency to group males together by "age-set," Chief Kaarà?khre's or the older Kaapeltuk's, and this too contributed to these distinctive bumps in the age distribution. The alternative explanations seem less probable: that something happened to increase the mortality in a certain age group, or that particular ages had a social significance in 1970 that has declined with time. Of course, in a small population, chance alone may be playing a role in determining the age distribution.

Crocker did document single events that had important implications for the population; for example, the deaths of three men in the age-set of the older Kaapeltuk in the 1963 battle with the ranchers. Between 1963 and 1968 he hypothesizes that a higher number of old people died in exile in the forest than would have died if the tribe had been in the savannah.

The high proportions at the younger ages, particularly in 1988, affect the ratio of productive adults to children and old people (the dependency ratio) substantially. Most change in the age pattern of work has occurred at the younger ages: Crocker found that before 1940, male adolescents were slower to begin working fully, while the Canela have always maintained high levels of activity through their fifties. Women continue to carry heavy baskets of manioc throughout their 50s and even later, while men race with logs until they are about 50. Although the Canela become weaker in their sixties, they continue to work in the fields. Table 2 shows

Figures 2c and 2d.

Population Age Distribution by Sex and Five-Year Age Groups in 1979 and 1988

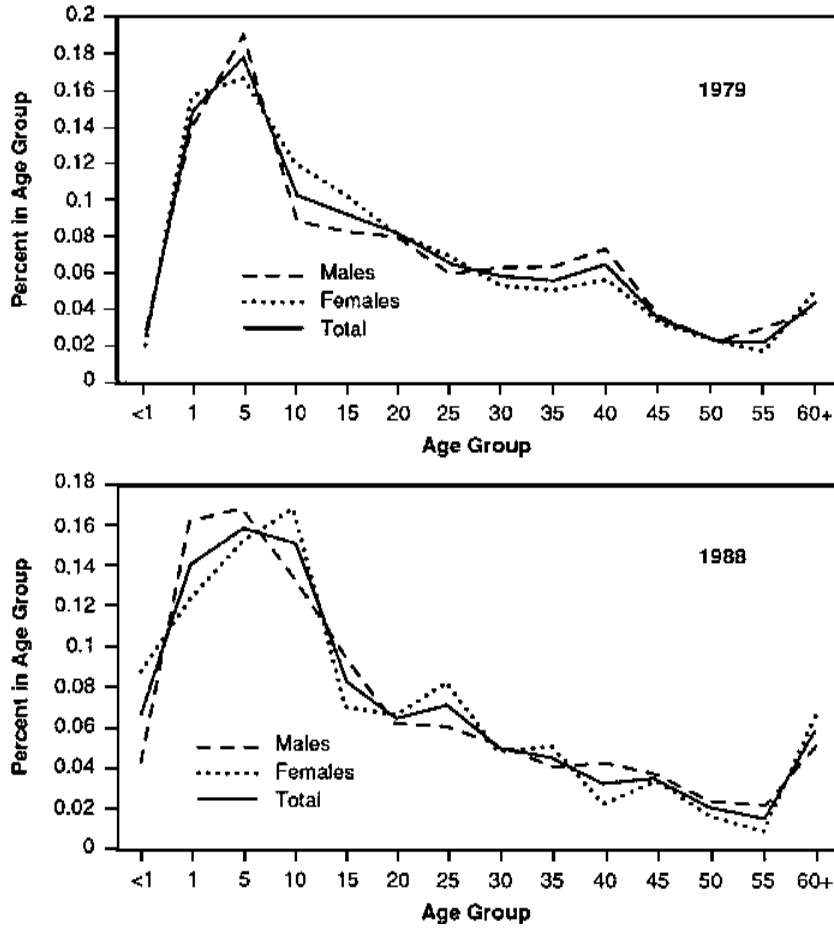


Table 2.

Population Age Groupings and Dependency Ratios by Sex

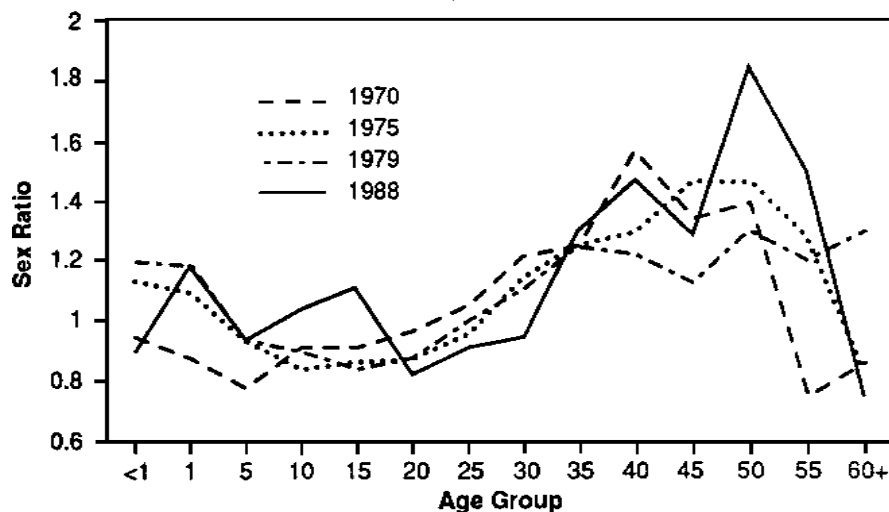
	1970	1975	1979	1988
<b>Total, Percent in Age Group</b>				
Under 15, 60 and Over	45.64	49.60	52.84	58.01
15 to 59	54.36	50.40	47.16	41.99
Dependency Ratio	0.840	0.984	1.121	1.382
<b>Males, Percent in Age Group</b>				
Under 15, 60 and Over	40.55	48.24	51.72	56.14
15 to 59	59.45	51.76	48.28	43.86
Dependency Ratio	0.682	0.932	1.071	1.280
<b>Females, Percent in Age Group</b>				
Under 15, 60 and Over	50.68	51.00	53.90	59.86
15 to 59	49.32	49.00	46.10	40.14
Dependency Ratio	1.028	1.041	1.169	1.491

the proportions of the population under age 15 and over age 60, and between the ages of 15 and 59. The striking fact to be seen in this table is that the proportion in the middle years (15-59) decreases from 54 percent in 1970 to 42 percent in 1988, while the proportions under age 15 and aged 60 and over increase from 46 to 58 percent. The dependency ratio, calculated as

$$\frac{(\text{Under 15} + \text{Over 60})}{(\text{Ages 15 to 60})}$$

increases from .84 to 1.38. We can understand this more intuitively to mean that while in 1970, each adult had to provide for one other person in addition to him or herself, by 1988, each adult was providing for a closer to one and a half other people, on average. The dependency ratio for men increases dramatically, but reaches an even higher level for women, indicating that women may have experienced a greater decline in mortality, particularly in their 40s and 50s.

Figure 3.  
Sex Ratios by Age Group and Year



A final point to be made about the age distribution of the population can be seen in Figure 3. The graph shows the ratio of males to females in each age group and shows a consistent pattern in each of the four years for which we have information. In most populations about 106 males are born for every 100 females, and so in the first year of life we might expect to see a ratio slightly exceeding 1. Females generally have lower mortality than males, a pattern which would lead to a sex ratio that declines with age. In the Canela population, however, the sex ratio dips below 1 only for people ages 5 through 24, and then rises to exceed 1 by far until the last age group. There are two possible explanations for this phenomenon: The first is that female mortality does exceed male mortality, perhaps as a result of the risks of childbearing, leaving fewer and fewer females relative to males at each successive age. The second explanation is that the ages of the Canela men were more likely to be exaggerated in the process of estimation than the ages of women. In a growing population, there are fewer people in any older age group than in any younger age group. If men exaggerated their ages, they would disproportionately place themselves in smaller, older age groups, where there are relatively few females. This process would produce the pattern of sex ratios we observe in Figure 3. The 1988 age distribution is almost certainly skewed upward, particularly by men, because of their wish to be considered *aposentado* (retired) farm hands earning government pensions. This new source of funds, available since the mid-to-late 1970s, has changed Canela behavior. However, this change was sufficiently significant to be captured only in the 1988 data, which were recorded by the agent in the village. The Indian service agents collaborate in this exaggeration in order to help the Canela receive pensions. Whether a real difference in mortality also contributes to the high sex ratios will be discussed later in this analysis.

### Marriage and Marital Status

Canela marriage, somewhat like marriage in sub-Saharan Africa, takes place through a series of steps and becomes relatively more complete over time. Marriage is matrilineal and almost always endogamous to the tribe. The village circle is composed of longhouses whose resident women are related through female consanguineal links, and marriage is exogamous to the longhouse for three or more generations. (See Crocker 1990:240-243).

If a virginal woman sleeps with an unattached young man, they are by definition wife and husband. Lasting marital relationships may start from such sexual involvements, in which case the young man goes to live in the house of his wife. A child traditionally cements a marriage until the youngest child is a mid-adolescent. "Divorce" occurs when a man leaves his *children*, not his wife. Childless couples can take on other partners easily, and this does not constitute divorce. An examination of the few cases of men leaving their children on their own initiative revealed exceptional circumstances until 1975, when a slow trend toward divorce from children seems to have begun. This was influenced by the legalization of divorce in Brazil during the late 1970s, after which Indian service personnel gave their permission for Canela divorces. Most older couples remain married until death takes one of them.

To summarize the processual style of marriage among the Canela, we present simple proportions Single, Married, Separated, and Widowed, by age and sex in Table 3. Note the contrast between men and women in the 15 to 19 age group in the level of marriage and singlehood. Women were much more likely to marry at this age than men in all three census years of the 1970s, with men more likely to marry between ages 20 and 29.

Table 3.  
Percentage Distribution in Marital Status, by Year, Sex, and Age Group

	Males, 1970					Females, 1970				
	N	Single	Married/ Remar	Wid	Sep/ Div	N	Single	Married/ Remar	Wid	Sep/ Div
0-9	57	100.0	0.0	0.0	0.0	70	100.0	0.0	0.0	0.0
10-14	21	95.2	4.8	0.0	0.0	30	73.3	26.7	0.0	0.0
15-19	25	68.0	32.0	0.0	0.0	19	10.5	89.5	0.0	0.0
20-29	26	11.5	88.5	0.0	0.0	36	13.9	86.1	0.0	0.0
30-39	41	0.0	92.7	0.0	7.3	32	0.0	93.8	3.1	3.1
40+	34	2.9	91.2	2.9	2.9	24	0.0	66.7	29.2	4.2

	Males, 1975					Females, 1975				
	N	Single	Married/ Remar	Wid	Sep/ Div	N	Single	Married/ Remar	Wid	Sep/ Div
0-9	92	98.9	1.1	0.0	0.0	87	100.0	0.0	0.0	0.0
10-14	21	95.2	4.8	0.0	0.0	28	53.6	46.4	0.0	0.0
15-19	23	43.5	56.5	0.0	0.0	29	6.9	93.1	0.0	0.0
20-29	34	2.9	97.1	0.0	0.0	35	5.7	88.6	0.0	5.7
30-39	42	2.4	92.9	2.4	2.4	30	0.0	90.0	0.0	10.0
40+	40	2.5	95.0	2.5	0.0	35	0.0	68.6	28.6	2.9

	Males, 1979					Females, 1979				
	N	Single	Married/ Remar	Wid	Sep/ Div	N	Single	Married/ Remar	Wid	Sep/ Div
0-9	107	99.1	0.9	0.0	0.0	104	100.0	0.0	0.0	0.0
0-14	26	100.0	0.0	0.0	0.0	35	71.4	28.6	0.0	0.0
15-19	24	50.0	50.0	0.0	0.0	30	16.7	83.3	0.0	0.0
20-29	40	2.5	97.5	0.0	0.0	44	4.5	95.5	0.0	0.0
30-39	31	3.2	96.8	0.0	0.0	29	0.0	86.2	3.4	10.3
40+	54	1.9	90.7	3.7	3.7	49	0.0	67.3	24.5	8.2

Men are also considerably less likely to be widowed than women, which lends support for our view that men's ages are more exaggerated than women's, because *they* should be widowed more than women if they are in fact outliving women. This pattern among men does not change much over time.

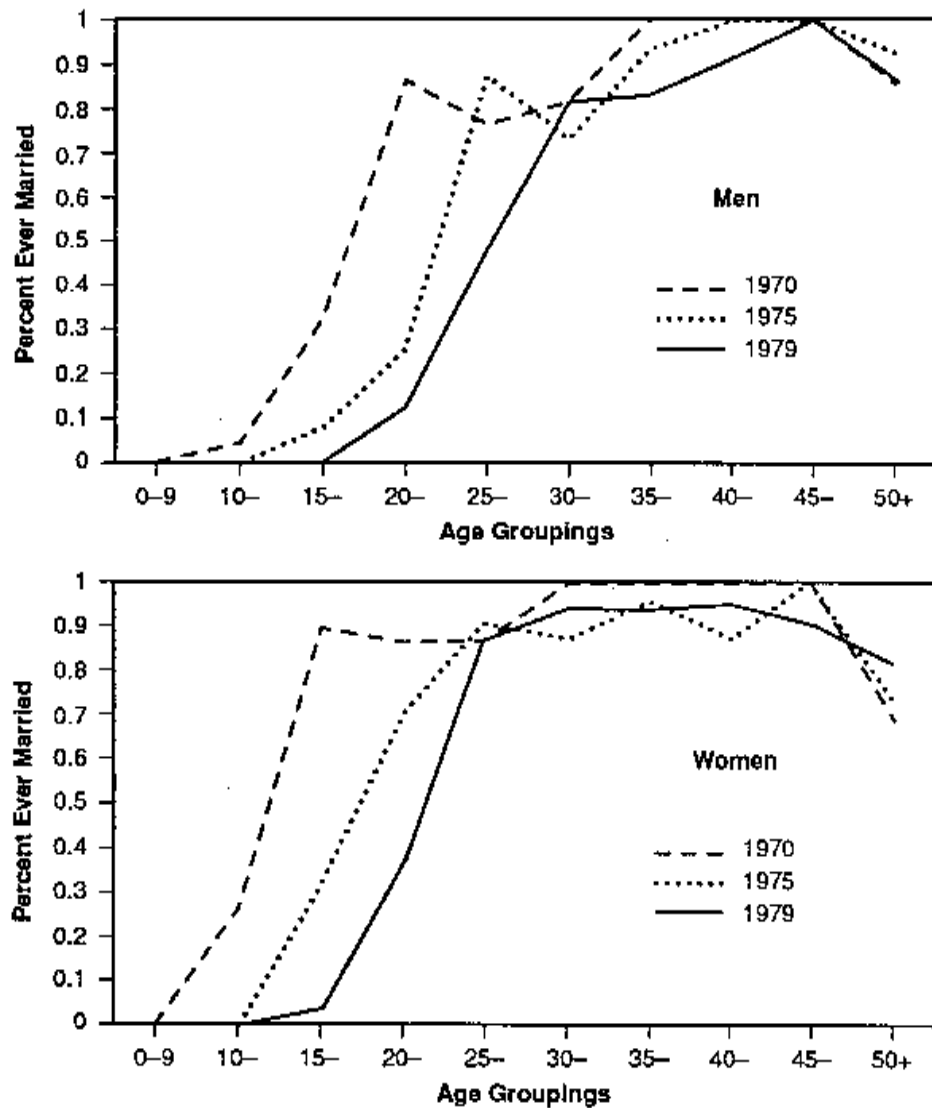
Also of note is the rate of divorce or separation for women, which increases over time but remains low or even declines for men. This decline suggests that it is somehow easier for men to remarry, and to marry much younger women the second time around. An alternative explanation is that men have an increased risk of dying in the divorced state which is plausible given that husbands are several years older than their wives on average.

Figures 4a and 4b present the ages at which men and women in the population marry in each of the three years

of the 1970s for which we have data. We can see that while the general shape of the curve has remained stable, the Canela have come to marry slightly later as time has passed during the decade of the 1970s. A large increase took place between 1970 and 1975, and a smaller one between 1975 and 1979. Figures 5a through 5c graph the proportions ever married for men and women in 1970, 1975, and 1979. The age gap between men and women at the time of marriage remains about the same (approximately four years), even though marriage is occurring at somewhat older ages at each date. This is particularly interesting in view of Crocker's earlier work on marriage (1984:70) which indicated that previous to about 1940 Canela men and women had married at older ages and had a greater age difference.

Because Canela postmarital residence is matrilineal,

Figure 4.  
Proportion Ever Married



men are essentially adjuncts in the households of their wives. A husband's economic responsibility is just one part of the balance of power:

In the marital balance, the women are seen as suffering more.... Consequently, the husband is continually rebalancing the marital "scales" by working hard and making small payments to his wife's family (Crocker 1984:68).

While both parents are responsible for providing food, the mother is responsible for distributing it within her nuclear family. With this pattern of nuclear families separating from the extended family for the purpose of eating, it is especially unfortunate for children if their mother dies and their father leaves the household to remarry elsewhere. Consequently, when a

woman dies her family tries to find a younger sister or a cousin for the widower to remarry so that he may remain in the same household with his children. A direct analogy to the father's relatively loose link with his wife's family is enacted in the social dances that take place almost daily: the women stand in

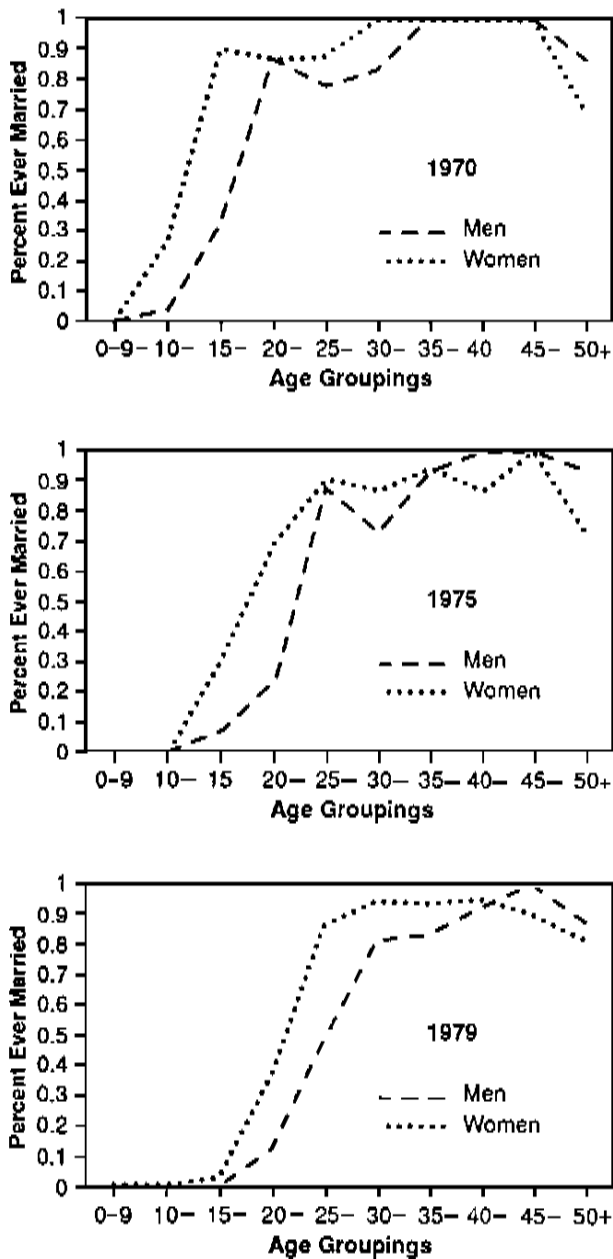
one place, bending their knees, swinging their arms and raising their upper bodies, while the men walk, lope, hop and skip independently before the women. Men's relationships with their sisters and mothers are more important and stronger than those with their wives until they have had several children

### Fertility

Populations in which births are controlled tend to have fertility that declines after women have a certain number of children. A concave curve is produced when the age-specific fertility rates are graphed. In contrast, natural fertility is the same



Figure 5.  
Proportion Ever Married, by Sex



regardless of the number of births a woman has had already (Henri 1979). Thus, women who breastfeed for the same length of time after each birth are demonstrating natural fertility behavior, even if the breastfeeding may ultimately reduce the overall number of children they have.

We expect to find natural fertility among the Canela and not much change in the level of fertility over the period 1970-1979. A number of different customs govern and influence women's sexual activity and thus their risk of pregnancy. Crocker has documented the association of girls with male societies, so that they will learn to like to receive non-related men sexually in amorous trysts.

Women take the initiative and choose men for these quick sexual encounters at least as often as men choose women.... A Canela's sexuality is considered among her or his most valuable assets in interpersonal relations. Thus no one should be stingy when somebody else wants or needs the pleasure their cooperation can give (Crocker 1990:106).

The Canela concept that one's body is a possession which should be shared with others significantly influences sexual behavior, and thus the chances of becoming pregnant and bearing children. First sex occurs between the ages 10 and 13; between the ages of 13 and 18 girls are generally married but childless.

Pregnancy does not change a woman's behavior much, and no restrictions exist on sexual relations during pregnancy. Intercourse may continue with any "other husbands" until the seventh or eighth month. The possibility of having sex is broader than just with the contributing fathers, who must have sex many times with the prospective mother, or they would not be named as such by her. During the pregnancy a woman begins to think about whom she wants as contributing co-fathers for the "biological" formation of the fetus and lifelong contributors of support to the child. She looks around for chances to have love trysts with such men. If any man with desirable characteristics (which are thought to be transmitted through the semen to the fetus) shows reluctance to have intercourse with her, she may say that she is pregnant. The reluctant man cannot refuse because the Canela believe the rejection might cause a miscarriage.

Among the Canela, extramarital practices and the acceptance of multiple ethnobiological paternity put the onus of sterility or barrenness on women. If conception does not occur, the problem must be the woman's, not her husband's, because her several "other husbands" would make up for the social husband's sterility or homosexual orientation. Several homosexual men were identified in the tribe and they were not teased or criticized extensively. By the late 1970s, however, homosexuality was increasingly disapproved of because of backlander influences.

The practice of having multiple sex partners accounts for the very low proportion of women who remain childless once they are well into their child-bearing years. The age distributions of the proportions of women who are childless and the numbers of children ever born to women, by age group, appear in Figures 6a and 6b. The proportion childless appears to drop more precipitously to near zero in 1979, the last year for which we have data, than it does in earlier years.

Childbirth is the final step in achieving adult female status and is a principal time of transition for women, especially if the first birth survives and another follows. The birth ties a woman down to her mother's and sisters' household and reduces her extramarital sexual freedom.

Figure 6a.  
Proportion Childless, by Age

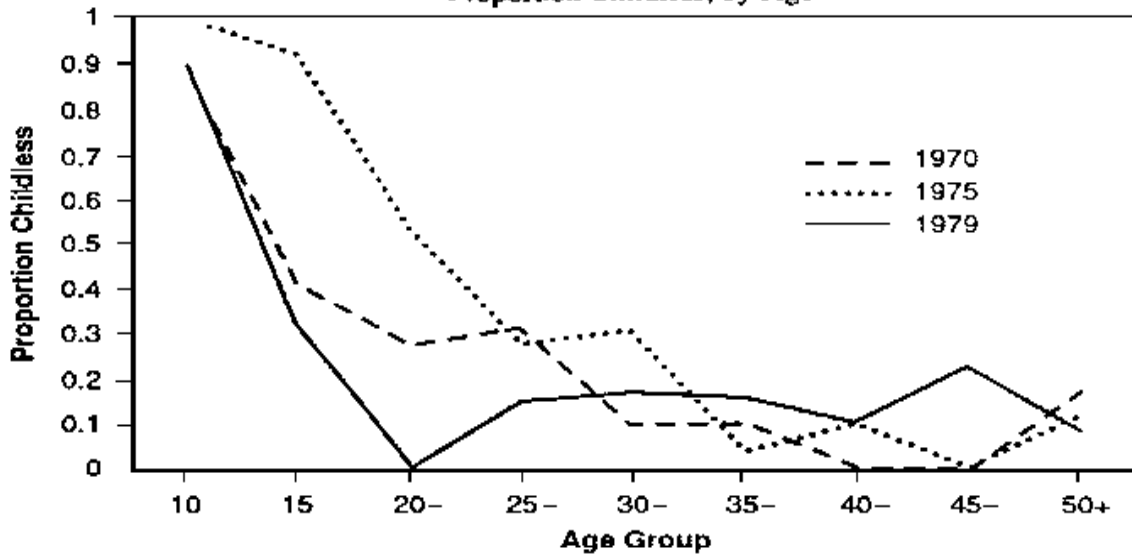


Figure 6b.  
Mean Children Ever Born, Currently Married Women



While young husbands now live with their wives, guaranteeing more sustained sexual relations between spouses and greater chances for producing the first birth, there was a decline in extramarital sexual activity between 1970 and 1979 which might have had the opposite effect on overall fertility. No clear trend is visible from Figure 6b, which graphs the mean number of children ever born, partly because of the erratic distribution of women in the different age groups.

Figure 6c graphs the proportion of women, by their age group, who have had six or more children. At the older ages there is a clear trend downward. The proportion of women ages 20-39 who had six or more children declined in 1975 and increased in 1979. This may show the influence of the

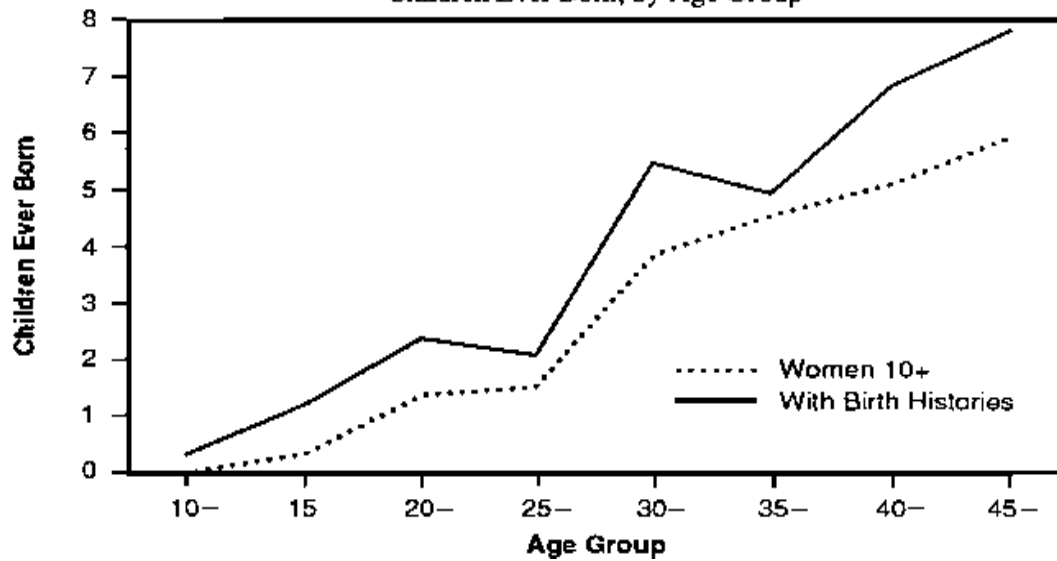
Table 4.  
Mean Children Ever Born: Proportion Having Had a Child  
By Age Group of Women Aged 10 and Over in 1970

Age	N	Mean CEB	% had child
10-14	30	0.17	0.02
15-19	19	0.82	0.32
20-24	21	1.88	0.65
25-29	15	1.80	0.67
30-34	21	4.69	0.85
35-39	11	4.71	0.84
40-44	5	5.95	0.80
45+	25	6.83	0.87

Figure 6c.  
Percentage with Six or More Children



Figure 6d.  
Children Ever Born, by Age Group



decline in prolonged breastfeeding, for example, on the spacing of births. With shorter periods of breastfeeding, young women may be experiencing shorter birth intervals. Figure 6d graphs by mothers' age the number of children ever born. The first of each of the pairs of lines uses data on all women over age 10 for whom we have information, the second includes only women for whom we have birth histories. The data based on birth histories indicate slightly higher and earlier fertility, probably due to the greater accuracy of these data. This information is also presented in Table 4. Information on dead children in particular would often have been missed for women with whom Crocker did not sit down to work out the details of their entire childbearing experience, as he did to obtain birth histories in 1970.

### Infants, Children and Adoption

The Canela formerly breastfed their children on demand and for extended periods during the day for two to four years. In recent times, however, this period has declined to considerably less than two years, and the proper time for weaning is considered to be between teething and walking. At two to four months the baby begins eating mashed foods, and by nine months the mother might give it soft cooked meat. Traditionally, the husband was not to return for regular sexual relations until after nursing was over. More recently it seems that husbands may be less observant of this proscription. If the mother becomes pregnant in spite of the practice of avoiding

intercourse while actively nursing, she quickly weans the baby, believing that it would become sick if it continued to nurse while a new pregnancy is in progress.

The organization of Canela households, with mothers' sisters and mothers' mothers permanently in place, insures the care of orphaned children. However, it may still make a difference for children's survival if their mother dies. Even though their mother's sister or their mother's mother takes charge of such children, it is likely that they receive less attention than if their mother were alive. Adoption (*criação*) includes the completely automatic adoption of children by the mother's sister, who is already a "mother," when the mother dies, as well as sending children to an old couple, most likely the child's patrilineal kin. If we were to look for those adopted children who are suffering hardships, we would most likely find them away from their natal homes. Adoptions among the Canela seem to occur based on the need of the adoptive parents for someone to help them (e.g., old people) rather than on a surplus of resources in their household. Our data show a very slight decline in adoption with time, which may indicate lower parental mortality, better nutrition, and a change in data quality. Adoption appears to have little effect on household composition and size with time for the three periods for which we have data, and the proportion of all individuals who were living with adoptive parents was between 2 and 5 percent; the same figure for children up to 19 years of age was between 4 and 9 percent.

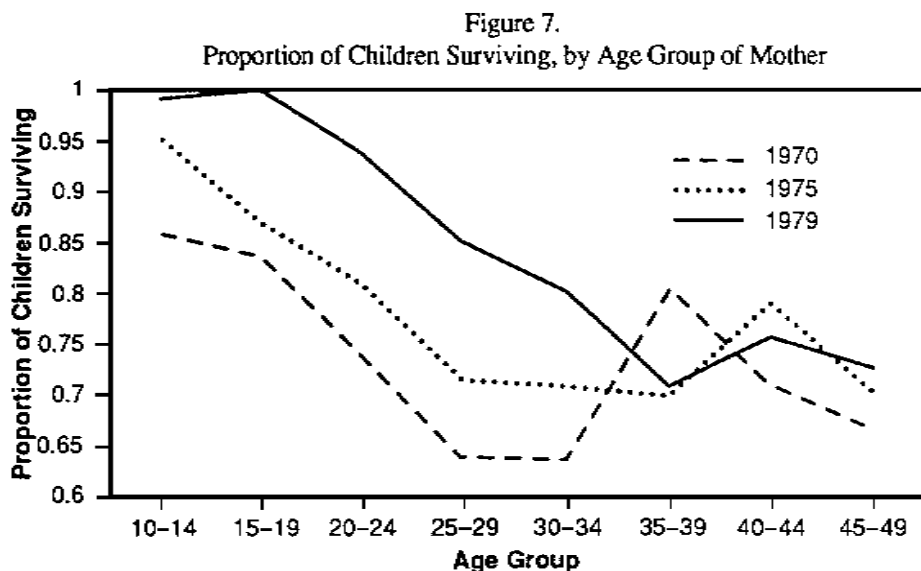
## Health and Mortality

Canela practices that affect health have changed over time, and it is worth noting some of the more important health landmarks of the period under study. Among the most important events was the arrival of a particularly influential agent of

Table 5.  
Child Survival Ratios by Age Group of Mother

Age of Mother	1970	1975	1979
10-14	0.000	1.000	1.000
15-19	0.857	0.950	0.992
20-24	0.836	0.872	1.000
25-29	0.738	0.808	0.939
30-34	0.640	0.713	0.852
35-39	0.636	0.707	0.799
40-44	0.804	0.697	0.708
45-49	0.709	0.787	0.756
50+	0.666	0.702	0.724
Total N	164	201	239

the Indian service. Sebastião Pereira first came to the Canela in 1970 as a trained nurse. He had also received training in anthropology in Brasilia. While ample medicines, including antibiotics, had been available to the Canela through Indian service personnel since the late 1950s, they had not been applied well. Canela individuals had to come to the Indian service post to receive their medications, and the agents went to the village only to see the most serious cases. While the Canela believed in the efficacy of injections, they thought that once they were feeling better, they did not need to continue the required course of medication. Thus during the 1960s many died who could have been saved, especially adult tubercular patients and children suffering from dysentery and dehydration. Sebastião dramatically reduced infectious disease among children through his genuine caring for the Canela. Every morning, Sebastião took a basket of medicines from door to door



throughout the village, winning the trust of most mothers so that dysentery among young children was largely cured. His persistence in returning each day, and often more than once, was the important factor.

Table 5 and Figure 7 show the proportion of children surviving by the age group of the mother in 1970. The information on child survival for the population in 1970 is more reliable because that was the year that the birth histories were collected, but 1975 and 1979 survival rates are presented for contrast. From the graph we can see an increase in child survival between 1970 and 1975, and a more substantial one between 1975 and 1979. The decline in child mortality is somewhat less clear at the older ages, perhaps in part due to the complicating effect of the mortality of women themselves. Women who had given birth fewer times would presumably have greater chances of living to advanced ages – but their children had experienced the risky first years of life well before they could benefit from the medicines available for children born later.

The treatment for tuberculosis called for changes in Canela behaviors. Remaining in the village and resting instead of engaging in vigorous activity went against Canela values. Thus, when Canela had taken the tuberculosis medicines at the Indian service post for three months and were feeling recovered, they were tempted to leave the village and return to activities that required heavy physical exertion. Leaving the village meant terminating medical treatment, and log racing or carrying manioc baskets meant disturbing the healing process in the lungs, usually resulting in coughing up blood. When the patient returned to the post to be cured the second time around, the same medicines were usually ineffective, so the patient eventually died. To solve this medical problem Sebastião had to convince the Canela tubercular patient to stay in the post village for eight to ten months, until completely cured, and not to log race or carry heavy baskets when feeling well. Social pressures to log race or help carry supplies are extraordinarily compelling and effective in this group-oriented society, and few individuals could resist such pressures.

During the early 1970s the great sing-dance leader, the younger Tãami, lost his wife to tuberculosis. He had lost a son to this disease about five years earlier and had recently lost a daughter to a fallopian pregnancy. When another daughter began withering away with tuberculosis, Tãami, who was confined to the village by mourning and by his employment in the Indian service, listened to Sebastião and obeyed him. Sebastião insisted that Tãami's sick daughter come daily to the post for medications for at least eight months. He also insisted that she be relieved of heavy family duties and be fed well with special foods from Barra do Corda during this period. Tãami was able to buy the special foods with his Indian service salary.

Tãami's daughter survived, and eventually Tãami returned to leading his people in daily social sing-dancing. Subse-

Table 6.  
Crude Death Rates

	Total	Women	Men
1970-75	53	64	42
1975-79	29	18	40

quently, he convinced the elders of the tribe to issue orders that tubercular patients should submit to the full treatment recommended by Sebastião. Sebastião won the battle against tuberculosis through the cooperation of the whole tribe.

As we would expect, these improvements in Canela health are reflected in the mortality data. The roughest measure of mortality the crude death rate, is sensitive to the population age distribution, as a population dominated by children will naturally show fewer deaths. Table 6 presents the crude death rate (expressed in deaths per 1000) for the two intervals 1970-75 and 1975-79, first for the total population, and then for women and men considered separately. The whole population had a substantial decrease in mortality between the two periods, from 53 to 29. The remarkable fact that emerges, however, is that the decline was concentrated among women, who had substantially higher mortality than men in the first period, and substantially lower mortality than men in the second. Cause-of-death statistics taken in the mid-1960s, when the Canela were riddled by tuberculosis and dysentery, indicate that many women were dying during childbirth. It is Crocker's sense that more women died during childbirth in this earlier period than after 1975 because they were weakened by tuberculosis. We hope to use the Sardinha data to explore this hypothesis at a later date.

Another health problem for the Canela was alcohol. During the 1950s and 1960s, two leaders who were employees of the Indian service spent much of their monthly salaries on alcohol. Their poor example was widely followed, and drinking was heavy throughout the tribe. In 1964, however, Chief Kaarà?khre experienced a conversion which spread through the tribe. He got lost while hunting in the dry forests around Sardinha, and climbed a tree as protection from jaguars. During the night he ran a high fever from a bad cold. As it started to rain, he was first cold and then hot with fever; his predicament terrified him. He promised God that if he survived the forest, the jaguars and the fever, he would stop drinking. Kaarà?khre's conversion to sobriety was followed by many Canela males, so drinking was much lighter during the 1970s.

Another landmark in Canela health was the arrival

of an S.I.L. missionary couple in 1968 in the village of Sardinha who moved with the last Canela group to Escalvado later in the year. With the help of others, he installed wells at several places in the village and the post. He also helped a great deal with medical treatments, having had extensive training in this area. He even showed a film that was an animated portrayal of germ theory which many Canela came to understand, with the result that some even began to wear sandals when in the village.

## Conclusion

The small size and irregularities of the Canela population have made the use of both demographic and ethnographic methodology essential to this study. In this analysis, the demographic and ethnographic information have not simply confirmed each other; rather, each has provided its own evidence of population change among the Canela. One of the weaknesses of using externally defined demographic concepts, though these allow for comparability across populations, is that the same levels of fertility or mortality may conceal vastly different underlying features. For example, stable fertility among the Canela could reflect the opposing forces of decreasing extramarital sex, which reduces the chances of conception, and a shortening of the period of breastfeeding, which increases the chances of conception.

We call upon ethnography to document and explain differences in behavior, regardless of how they are reflected in our crude demographic measures. The ethnographic material shows up the inadequacy of our definition of marriage, for example, and permits a richer understanding of the marital power balance; we then situate this material within our understanding of kinship and changing Canela life over the past few decades. With regard to marriage, for example, sons-in-law have become increasingly important as independent economic providers. A weakening of intergenerational pressures has changed the balance of power within marriage.

The Canela tribe as a whole has been influenced by population change. The improvements in health and increases in population size are accompanied by better morale, but growth also has its negative implications. Population growth has indirectly shifted power to the younger men at the expense of the elders. Young men are increasingly divorcing wives with children still in their care, as shown in limited but reliable information received in 1990 and 1991. Before 1975, men could not divorce and leave their children easily. The current ability to do so gives young men leverage against their wives' families and gives the younger age-sets more power against the older age-sets, some of whose members constitute the Council of Elders. As the baby boomers of the 1970s reach their 30s, during the first decade of the next century, this age-set of young men may no longer obey the Council of Elders they have grown to far outnumber. Consequently, this younger cohort may take over

the political control of the tribe or cause a tribal schism, founding a village largely of their own on some part of the reservation. This would accelerate the loss of traditional values and practices.

Field data from 1991, supported by earlier information from the SIL missionaries, suggests that two strong former chiefs of the tribe were undertaking procedures to found a new village at the beginning of the next agricultural cycle – June/July 1992. They were doing this because they were out of political favor, because the Indian service post was offering fewer advantages to remain at the old village of Escalvado, and because members of the younger age-sets, most of whom were to remain in Escalvado, were becoming increasingly numerous and powerful. If the schism of the late 1950s can be taken as a model, a new schism would result in considerable ill will and demoralization between the two villages thus formed and throughout the whole tribe. The Canela need to have daily, or quite frequent, meetings of the elders of the whole population to resolve a problem before it grows too large.

By the 1950s the Canela had become quite dependent on the Indian service and on the backlanders. However, self reliance is growing among the younger generations, and the Canela belief, from the mid-19<sup>th</sup> century onward, that the Brazilian owes the Indian total support for having taken his lands and spoiled his way of life, which justified this dependence, has partly disappeared. The Canela have been putting in more extensive farms, but the extent of the stream-edge gallery forests on the reservation is limited, and eventually, with the population increasing, the Canela will have to turn to other resources than agriculture to support themselves. With the Indian service currently in disarray, it is hard to see how new forms of economic support will be introduced. Greater economic dependence on backlanders and on the Indian service will contribute to continued cultural change among the Canela. We mentioned that the Canela are now more disapproving of homosexual behavior. Through the influence of the backlanders, the Canela may largely abandon their extramarital practices as well. There are other signs that the Canela are moving toward a more rigid and Western definition of sex roles, contrary to the flexibility that has characterized the Canela ways in the past.

Potential solutions, particularly for economic problems, may lie with a number of young Canela who have learned to read and write. Three descendents of former chiefs attend schools in Barra do Corda, one of them a high school. This advanced student, especially, shows great academic promise and will probably go on to college in São Luis, the state capital. These students are totally supported by their extended families, whose members receive salaries from the Indian service. Other Brazilian Indians who become educated often leave their people and forget them. In this case, the supportive Canela kinship patterns and social structure may draw back tribal members who spend time away, as has happened in years past.

## Canela Timeline since 1957

(developed from Crocker 1990: 10-12)

- 1957 Received first visit of ethnologist William Crocker
- 1961 Graduated age-set of Kôham
- 1963 Suffered messianic movement, massive attack of backland ranchers, and relocation to dry forests
- 1964 Experienced anti-alcoholic “conversion” of chief
- 1968 Returned officially to their cerrado homelands; rejoined five tribal segments from different places into present large Escalvado village
- 1969 Construction of road bridge enabling army vehicles to move directly into Canela region to protect them after their return to their homelands
  
- 1970-74 Construction of three “permanent” large Indian service buildings in Escalvado: post, schoolhouse, and infirmary
  
- 1970-74 Began high population growth after near elimination of endemic infant and childhood dysentery
- 1971 Rejoiced in demarcation of their lands (legal in 1978 and final in 1983)
- 1971 Completion of direct road from Barra do Corda
- 1972 Graduated age-set of Koyapãã
  
- ca. 1973 Installation of gasoline generator for electricity for light and radio transmission to summon aid
  
- ca. 1974 Converted by Indian service agent to belief in pharmacy medicine to cure and nearly eradicate tuberculosis
  
- 1975 First divorce in which children were involved granted by the service and the tribal council
  
- ca. 1981 Installation of an Indian service store for buying material artifacts for resale throughout Brazil, facilitating self-sufficiency
  
- 1986 Benefited from extensive farm project

1986 Split into twelve farm communities with Escalvado having no leader and being almost abandoned

1987-89 Stabilized politically by appointment to chieftainship of the younger Kaapêltük

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