SI Appendix

Supporting Information for

Text

S1. What does the term Pygmy mean?

The term ‘pygmy’ was first used by Purchas (1) and later by du Chaillu (2) to refer to populations with a small adult height living in African Equatorial rain forests (3). These authors used the word ‘pygmy’ with reference to the term used by Herodotus and Aristotle in ancient times for populations with this phenotype living close to the source of the Nile. From the 20th century until now, the term ‘pygmy’ was extrapolated to any population with a small adult body size. Cavalli-Sforza (4) suggested that the term should describe populations whose average adult stature is less than 155 cm. This distinction is completely arbitrary and does not have any biological foundation.

The term ‘pygmy’ was, and is, largely used to refer to populations living in African Equatorial rain forests whose economy is based on hunting and gathering. These groups have a complex socioeconomic relationship with their farming neighbours. Moreover, pygmy peoples are systematically identified by their culture and behavior as pygmies by farming neighbours, who in turn identify themselves as non-pygmies and are recognized as non-pygmies by pygmies, as well as by other non-pygmies (5, 6). African pygmies can be grouped into two clusters. One is in East Africa (Ruanda, Uganda and Eastern DRC) and comprises the Aka, Sua and Efe groups (also frequently called ‘Mbuti’) and the Batwa. The other cluster, in West Africa (Cameroon, Central Africa Republic, Congo, Gabon and Western DRC), includes the Kola, Bongo, Koya, Aka, Baka and Twa. Studies on population genetics (7) have shown that African pygmies share a common ancestor and split from Bantu-speaking populations at around 60,000 years BP. Patin et al. (7) suggested that the eastern and western clusters split later, at around 20,000 years BP.

Therefore, the term ‘pygmy’ should be restricted to African populations as in its original usage to cover several populations who share not only a phenotype and an economy based on hunting and gathering but also a common ancestor and an evolutionary history not shared by any other African group.

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S2. Year 2007

2007 is the year showing the all-time lowest number of births among the Baka at Le Bosquet – but it is interesting to note (*SI Appendix,* Table S1) that the all-time highest number of births (n=55) in the history of Le Bosquet was recorded two years previously (2005). The low number of births in 2007 probably results from the fact that many mothers had infants less than two years of age. The number of mothers at Le Bosquet was also low in 2007 (Table 2), which seems to be the year when it had the smallest number of inhabitants. This isolated instance of migration concerns only that years and although the reason for it is unknown, it was probably due to the lack of particular resource at that time in Le Bosquet. It is possible that only first-time mothers who had just given birth or were close to doing so remained in Le Bosquet when other young women moved out, which would explain the high value of the ASFR observed for the 15-19 age class in that year.

S3. Living condition in Le Bosquet

The Baka living in Le Bosquet have kept to a semi-nomadic life, leaving the village for forest camps during specific periods of the year to gather various products (fish, mangoes) and sometimes for hunting or gathering expeditions at any time of the year. The Baka diet at Le Bosquet did not change during the entire period of study. It is based on manioc, plantain and bananas from crop plantations, vegetables (leaves, nuts, roots, fruits) and mushrooms and bushmeat from the forest. Fish is more common during the dry season (February), moabi oil and mango are available for a few months from the short dry season (June) and different kinds of honey are mainly available from the rainy season (October). Hunter-gatherer activities are complemented by work in their own or Bantu fields. When they earn wages as farm labourers (Bantu neighbour's field, clandestine mill, researchers), the Baka buy groundnuts and macabo. There is no record of any major change in these activities since the foundation of Le Bosquet, except for the arrival of cheap alcohol at the end of 2010 (see Discussion).

The work done by the Baka from Le Bosquet differs according to sex as in any other Baka community. No increase in Baka women's working activity at Le Bosquet was observed. Only the men are involved in extra activities other than those specific to the Baka, such as farm labour and working for logging companies. Farm labour is confined to fields close to the

locality and does not require the men to be absent for days at a time. It is usual for the Baka to go to work and back every day. This situation has not changed over the years.
Cameroon has undertaken major economic projects in the last ten years (e.g. deep water port in Kribi, iron mine in Mbalam) and has been involved directly or indirectly in armed conflicts (in Nigeria [Boko Haram] and the Central African Republic). However, neither project nor armed conflicts have brought changes to the Le Bosquet area. In 2009, a project for a cobalt mine which has been launched some years before seemed set to bring major changes to the area. Large areas of forest were cleared close to the Congo locality (~30 km from Le Bosquet). The mining company, Geovic, launched various kinds of projects to mitigate mining impacts in the region. When the 2008 crisis caused a fall in cobalt prices on the international market in 2010, the project was abandoned. The road linking Le Bosquet to Congo was closed in 2013 because of forest encroachment. Le Bosquet is a long way from the frontier zone with the Central African Republic, where mass migration has been reported due to the war in that country. Probably the most important effect of political activities in Cameroon on Le Bosquet was the placing of boundary markers around the forest community of Le Bosquet in 2009. It seems that Le Bosquet has become the only forest community in Cameroon attributed to a group of Baka pygmies, thanks to the work of the nuns who dealt with all the administrative procedures. However, this means that all other Baka communities who have not claimed the same land titles rights within the prescribed time could be deprived of their land if one day the central government decides to take possession of them.

S4. Total Fertility Rate and Age Specific Fertility Rate

Weiss (8), in his model tables (MT), proposed an ASFR and TFR based on data for female births only: ASFR is the 'chance of person x years old giving birth to offspring of same sex' (Table 0, page 2) and TFR is 'the average size of the family (in daughters) after the mother has reached menopause' (Ref. 8, p. 7). To other authors, the TFR corresponds to the Completed Family Size in the Weiss tables. When both sexes are considered, Weiss calls this the Mean Family Size. Howell, however, in her study on the Dobe !Kung (Ju/'hoansi) (9), used the 'number of children' (boys and girls) to estimate ASFR and TFR (Table 6.1, page 124) and indicated that 'we tabulate the estimated age of the mother at the birth of each of her children to construct ASFR' (Ref. 9, P. 123). Hill & Hurtado (10) state 'ASFR for Aché women who probably reported all live births in the forest are shown in Table 8.1 and Figure 8.3' (pages 253, 261 and 265) and define it as 'the number of women who gave birth at age x

divided by the total number (of women) who complete that age interval' (Ref. 10, p. 253). At no time do they mention that *only* female births are included in the analysis. ASFR for the Aché were compared with Howell's data without any kind of correction for the sex ratio, which reinforces the idea that Hill & Hurtado calculated ASFR and TFR using the total number of births and not exclusively female births as suggested by Weiss (8). In their work on the Yanomamo, Neel & Weiss (11) obtained ASFR after several corrections using the total number of births, but in Table 2 they give an ASFR in which 'daughters only are born by assuming a sex ratio at birth of 1.05 males per females' (Ref 11, p. 33). It is obvious that comparisons of data from different sources have to consider the different ways in which the data were obtained and make the necessary corrections.

Kramer & Greaves' work (12) deserves a special comment. They mention that TFR can be obtained by 'cohort rate', which means following 'a group of women in the same birth or marriage cohort as they pass through their reproductive careers, documenting births and deaths as they occur' (Ref 12, p. 718). In other words it is equivalent to monitoring women during their entire reproductive life, which is 'impractical', as the authors state. For this reason, Kramer & Greaves, like the majority of authors, obtain a TFR based on what they call 'period rates', which 'are constructed cross-sectionally from the numbers of births that have occurred over some period of time, usually within a calendar year, to women in different age groups' (Ref 12, p. 719): these are the ASFR. Since the number of births is divided by the total number of women, the specific fertility rates varies from 0 (no births) to 1 (same number of births as women, in other words all women give birth). It is confusing that the values for specific fertility rates for the four younger age classes of the Pumé are higher than 1.

We used data from 2012 to obtain ASFR, crude birth rate (CBR) and TFR (Weiss' Completed Family Size, CFS) in a similar way to Weiss (8); TFR was obtained from female births only. As in previous studies (4, 11), the few data available (ASFR, CBR and CFS) were entered into a Weiss table in order to find the values for other variables predicted by the model. We obtained a CFS of 2.317, which is close to that presented in MT 33.0-55.0. This MT suggests a mean family size of 3.64, which is much smaller than our value of 7.3. Another difference concerns the ASFR, since in the MT the higher value corresponds to ages 20 – 29 (0.117) whereas for the Baka it falls into the 15-19 age class (0.158). CBR for the Baka in 2012 is 0.021, which is lower than predicted in MT (0.0346). Thus, the data from the Baka do not fit into any of the Weiss model tables.

Cavalli-Sforza's study (4) on the Aka pygmies in the Central African Republic used only one variable, the average age of the population, to suggest the Weiss model table (MT: 22.5-40) as

probably representing this population. This table was used by Migliano and colleagues (13) to attribute several life history variables to the Aka pygmies. Our study of the Baka suggests that many variables have to be used to assess whether a model table fits the population under study. The use of tables inferred from only one variable can lead to an inaccurate description of the life history variables of a population.

References

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Figure S1

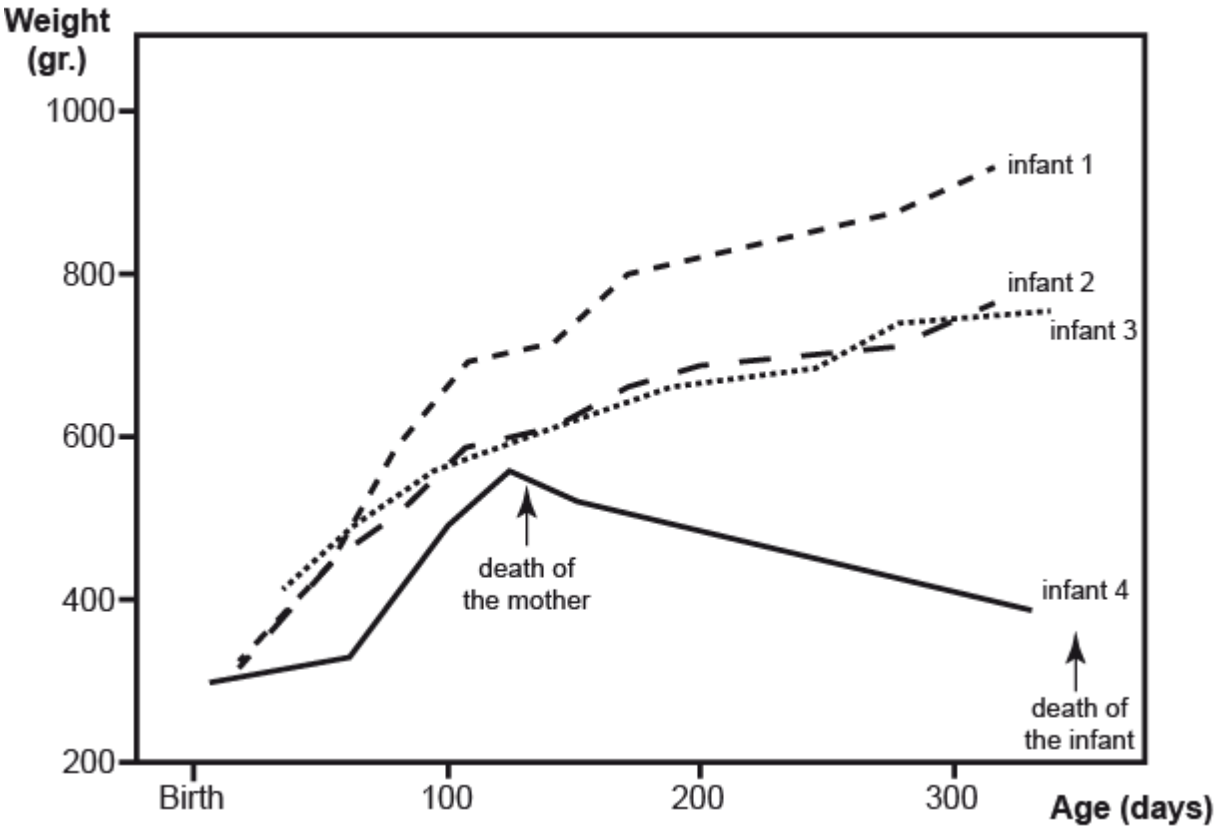

Figure S1: Loss of weight and death of an infant whose mother died. All infants shown in the graph were born around the same date: infants 1, 2 and 3 illustrate the normal increase in weight during the first year of life. Infants 1 and 2 are twins and their father is a half-brother of infant 4's father. Infant 4 was born in June 2011. After the death of his mother in November 2011, his father and other members of the family neglected him. They did not provide any care for him and never brought him back to the medical centre to be weighed; the last measure of his weight was taken by us one month before his death in June 2012. We recorded four cases like this one, which seem to illustrate the usual behaviour when a mother has died. The case presented here occurred in the family of our closest collaborators.

Table S1: Number of births recorded by year in Le Bosquet

Year	Births recorded	Year	Births recorded
1988	24	2002	36
1989	30	2003	30
1990	35	2004	39
1991	38	2005	55
1992	36	2006	25
1993	36	2007	17
1994	32	2008	37
1995	31	2009	40
1996	41	2010	37
1997	25	2011	26
1998	27	2012	33
1999	39	2013	21
2000	39	2014	35
2001	41	2015	30

Table S2: Sample size for each analysis

Analysis	N
Known reproductive history	16*
Average completed family size	15*
Reproductive period	15*
Age at menopause	15*
TFR & ASFR 2007	95 (17)
TFR & ASFR 2008	113 (37)
TFR & ASFR 2009	163 (40)
TFR & ASFR 2010	167 (37)
TFR & ASFR 2011	157 (26)
TFR & ASFR 2012	180 (33)
TFR & ASFR 2013	155 (21)
TFR & ASFR 2014	189 (35)
TFR & ASFR 2015	177 (30)
Infant mortality by parity	44
Children mortality	212
Weight first two months	90

*: same individuals
TFR & ASFR: total fertility rate and age specific fertility rate – number of reproductive women (number of births)

Table S3: Weight of infants in the two first month of life

	Month	2008-2010	2012-2014	*p*
Female	1°	3,6 (13)	3,7 (14)	0.709
	2°	4,3 (11)	4,4 (10)	0.614
Male	1°	4 (11)	3,5 (12)	0.243
	2°	4,8 (9)	4,9 (10)	0.808

The average and the sample size (in brackets) is given for each period.