H. Nelson

G. Chisum

A computer assisted method for age-determination in non-literate populations

In: Bijdragen tot de Taal-, Land- en Volkenkunde 130 (1974), no: 1, Leiden, 132-137

This PDF-file was downloaded from <http://www.kitlv-journals.nl>

HAL NELSON AND GARY L. CHISUM

A COMPUTER-ASSISTED METHOD FOR AGE-DETERMINATION IN NON-LITERATE POPULATIONS

Estimation of ages of individuals in censuses and genealogies is a serious problem for ethnographers working in populations without written birth records or systematic calendrical knowledge. The "eyeball" method of estimating ages, used by most anthropologists in such circumstances, has a high risk of inaccuracy. First, most of us have difficulty with age-estimation by this method in our own culture. Even though we know what "middle-aged", or "sixtyish" people are supposed to look like, we are frequently surprised by substantial over- or underestimation of ages when more accurate information becomes available to us.

Secondly, our cultural age-stereotypes are not likely to help much in their application to members of another population. Few of us have any idea what "sixtyish" Melanesians are supposed to look like, so we are prone to apply the criteria supplied by our own cultures, however faulty they may be. Third, many environmental, economic and nutritional factors may affect the physical appearance of aging in immeasurable ways.

One of us (Nelson) discovered, while recording census and genealogical data among the Kaimbi-speaking people of the New Guinea Highlands, that by use of the eyeball method he was rather consistently overestimating the ages of women and underestimating the ages of men. Most of the error was probably due to differential physical deterioration between males and females in the New Guinea Highlands. Because of heavy garden labor, poor nutrition, and protein loss through menstruation, pregnancy and lactation, females "age" physically more rapidly than males. The discovery of this error led to a correction in the eyeball technique, though perhaps not a very systematic one.

The error was discovered through comparisons of estimated ages with informants' statements regarding birth order of siblings and peership. The population in question is not age-graded, nor are there either male or female puberty rites, but each individual knows or can find out who his peers are and whether he is older or younger than another individual.

It occurred to us that this fact could be used to develop a systematic method for estimating ages.

Basically, the method proposed for estimating the ages of individuals is a procedure which ranks individuals on the basis of two kinds of information. Specifically, each informant is asked to provide two pieces of information:

1. a list of all individuals of ego's peer group (Figure 1);
2. a list of ego's siblings ranked by birth order (Figure 2).

In the past, the coding and sorting of such information, even for a very small community, would be a tedious and time consuming task; but by using a modern high speed digital computer the task of sorting, at least, can be reduced considerably.

Figure 1

A PARTIAL PEER GROUP IN A NEW GUINEA HIGHLANDS CULTURE
(NEBILYER VALLEY KAIMBI)

I.D. No.	Name	Clan/Lineage
078 [Ego]	Kindap	Kogə Pagəmp Kaugəmp
142	Kundil	Kogə Pagəmp Ganigəmp
315	Wagəp	Miliga Andəkəlikarə Keglua
185	Palt	Miliga Andəkəlikarə Kiglbuga
467	Kerjanə	Miliga Orogəmp Meyəmp
459	Paraga	Tibulga Oibəgəmp
113	Kuglup	Oibaga Goipi

Figure 2

A SIBLING GROUP RANKED BY BIRTH ORDER
IN NEBILYER VALLEY KAIMBI

I.D. No.	Name	Father	Clan/Lineage	Mother	Clan/Lineage
077	Mbak	Mandi	Kogə Kaugəmp	Pena	Kulga Kuigəmp
078 [Ego]	Kindap	"	" "	Tagəp	Miliga Kiglbuga
079	Kont	"	" "	Pena	Kulga Kuigəmp
080	Komun	"	" "	Pena	" "
081	Pagara	"	" "	Tagəp	Miliga Kiglbuga
082	Wagi	"	" "	Pena	Kulga Kuigəmp
083	Yok	"	" "	Mogalimp	Timbulga Oibəgəmp
084	Mberj	"	" "	Mogalimp	" "

The following is an outline of the proposed scheme:

1. acquisition of data: a census is conducted and each person is assigned a code number. The census becomes an index or catalog of

the community's members. Each person in the community is asked to list (a) his peers, or members of his peer group and (b) his siblings and their birth order.

2. coding of data: each informant's responses represent one record of information. Each record contains:

- a. the informant's code number;
- b. code numbers of peer group members;
- c. code numbers of siblings ranked according to age relative to ego and one another.

Figure 3

SAMPLE DATA RECORD [see Figures 1 and 2]

078, 142, 315, 185, 467, 459, 113 077, 078, 079, 080, 081, 082, 083, 084

3. processing of data: when each informant's record has been recorded on magnetic tape or computer cards, the data is ready for processing by the computer. The program employed does several tasks:

- a. performs an initial merge and sort; i.e. it produces a series of lists of siblings, ranked according to age, and their respective peer groups;
- b. performs a cross-tabulation of individual family lists; i.e., first, it compares the peer group responses of all egos; then, by comparing the peer group responses of egos ranked only according to siblings, it is possible to achieve a relative ranking of all informants.

Assume, for instance, that we have two siblings groups with their respective peer groups:

A: 026:	002, 003, 067
027:	004, 079, 122
028:	054, 125
B: 093:	013, 124
094:	014, 136
095:	138, 214
096:	216, 015, 130
097:	028, 125, 054 *
098:	056, 033

* Individuals appearing on previous lists are italicized for ease of recognition in this presentation.

A + B

026, 002, 003, 067	093, 013, 124
027, 004, 079, 122	094, 014, 136
	095, 138, 214
	096, 216, 015, 130

098, 056, 033

C:	001:	018, 019
twins	{	002: 003, 026, 067
		003: 002, 067
		004: 027, 109, 122
		005: 098, 127

A + B + C:

026, 002, 003, 067

004, 027, 109, 122, 079	093, 013, 124 094, 014, 136 095, 138, 214 096, 216, 015, 130
-------------------------	---

098, 056, 033, 127, 005

D: 122: 109, 004, 027
 123: 009, 071, 146
 124: 013, 093, 129
 125: 097, 028

A + B + C + D:

001, 018, 019
026, 002, 003, 067
027, 079, 109, 004, 122
123, 009, 071, 146
093, 013, 129, 124
094, 014, 136
095, 138, 214
096, 216, 015, 130
028, 054, 125, 097
098, 056, 033, 005, 027

A vertical line with arrows at both ends. The top arrow points upwards and is labeled "Oldest". The bottom arrow points downwards and is labeled "Youngest". The text "Birth Order" is centered next to the line.

It will be noted that provision is made in the method for the circumstance in which a sibling is also a peer. Twinning is the most obvious cause of such an eventuality, but it might also occur in polygynous societies when co-wives give birth about the same time. In the event of either, peer-siblings (see list C) would simply share the same peer group.

Possible errors in the data, either resulting from informant error in listing peers and/or birth order, or from recording or keypunching of data, may result in a failure of two or more peer groups to rank. To identify the source of error so that necessary corrections can be made, simple subroutines may be written into the program to identify possible locations of error. A key feature of the basic program is that inconsistencies in the data will prevent a complete ranking; thus it is not possible to receive in the final output disguised error.

By itself, the method described above is capable of giving us only a relative age ranking of individuals. A simple tactic, however, will enable us to transform it into a relatively absolute scale, with dates being assigned to particular points in the ranking. This tactic is to treat datable events as data in the form of peers. For instance, the effective date of European contact for Nebilyer Valley Kaimbi was 1933, the year of Jim Taylor's first patrol in the area. The event is known colloquially as "Jim Taylor" and people can identify the individuals born about the time of the event. "Jim Taylor" can be assigned a code number (e.g., the last three digits of the year, 933) like a peer and can be ranked in sequence with the birth-ordered code numbers. A series of such events, e.g., the eruption of Krakatoa (1883), the bombing of Mt. Hagen (1943), the establishment of the Aid Post (1953), etc., can give a certain fixity to the processed data. If, for instance, individual 027 was born about the time of the arrival of the first Europeans, the year code number 933 would be listed as one of his peers; similarly if individuals 014 and 125 were born respectively at the times of the bombing of Mt. Hagen and the establishment of the Aid Post, they would have as peers the year codes 943 and 953. The new list would appear as follows:

	001, 018, 019
	026, 002, 003, 067
[1933]	027, 079, 109, 004, 112, 933
	123, 009, 071, 146
	093, 013, 129, 124
[1943]	094, 014, 136, 943
	095, 138, 214
	096, 216, 015, 130
[1953]	028, 054, 125, 097, 953
	098, 056, 033, 005, 127

Code numbers beginning with 8 and 9 should be reserved for the purpose of indicating year dates.

One technical problem with using a method such as this is, of course, the fieldworker's access to a digital computer. In order to check for gaps in data or corrections of ranking error, it would be to the fieldworker's advantage to have a printout of his data before leaving the field. He obviously cannot take along his own computer, and computer facilities may be relatively inaccessible to him. We recommend accordingly that individuals who anticipate using such a computer-assisted method design their programs and data formats in advance of fieldwork departure so that data sheets can be sent to an agent in one's home university for keypunching and computing. With the results of a preliminary run, necessary corrections and additions may be made without leaving the scene.

We do not anticipate that our method will by any means solve all of the problems faced by the field ethnographer or demographer. However, with careful advance planning, it will aid immeasurably in producing accurate data on the structure and characteristics of non-literate populations.

ARIES Corporation, Minneapolis.

University of Wisconsin, Milwaukee