Chapter 6. Patterns in the variation of ethnobotanical knowledge

In this chapter, I present quantitative results from free lists and trail walk exercises that were analysed with the aim to find patterns in the variation of ethnobotanical knowledge with regards to naming and identification as well as the ability to name plant uses. I examined levels of knowledge sharing by analysing consensus among informants on trail walks. Individual knowledge scores from the trail walks were used to analyse the relationship between formal education and ethnobotanical knowledge in a linear regression model. Besides these quantitative data, I have added qualitative information based on informal discussions and participant observation.

6.1. Theoretical and practical ethnobotanical knowledge

Plant knowledge can be viewed as a "clearly bounded cultural domain" (Berlin 1992:7; Gardner 1984: 259) contributing to understanding human cognition. When conducting fieldwork, language is the first key to enter this domain, and knowledge that is encoded in nomenclature has been described as "lexical" knowledge (Ellen 2003: 48). Other scholars differentiate "theoretical"(ability to name) and "practical " dimensions of ethnobotanical knowledge (Reyes- Garcia et al. 200), and have found that while ethnobotanical nomenclature is acquired by adolescence (Hunn 2002), practical skills are often only gained in adulthood (Ohmagari and Berkes 1997).

6.1.1. Lexical plant knowledge

According to the number of plant names mentioned on free lists, and knowledge scores from trail walks, old Mambila men and women hold a higher lexical knowledge than their younger counterparts, especially in the domains of medicine and ritual[33].

Men, in general, were also able to name plants in a language other than Mambila (Fufulde or French) more frequently than women, even though these names often reflected incorrect use. Such confusions in naming could be related to morphological similarities, similar use contexts, or similar colour. The tall 'kapokier' (*Ceiba pentandra)* was called **baobab**, which is another widely distributed, large African tree, 'iroko' (*Milicia excelsa),* the famous 'African teak', was, at times, misnamed 'mahogany' (which as an industrial category refers to trees from sometimes widely different genera), and 'acajou', which generally refers to cashew (*Anacardium occidentale)* and has a reddish heartwood, was mentioned by one

[33] See Appendix II, table 10

informant as the French name for ‘camwood’ (*Baphia nitida*), the source of a red dye. One older man misidentified the culturally significant tree **lií** (*Erythrophlaeum guineense)*, which has been used in traditional oath takings, as **luú** [34], of which he knew that the resin is used as incense.

Lexical knowledge of the various landraces of corn, however, was widely shared and consistently named among all groups, as were the names of the most conspicuous food plants on the freelists and on trailwalks.

6.1.2 Substantive plant knowledge

However, a large part of ethnobotanical knowledge is embedded in the practices people engage in (such as weeding, watching parents manage plants) and is not articulated in language. Mimicking thus transmits latent knowledge which has been called “substantive”, “bodily” (Ellen 2003:48) and “practical” ethnobotanical knowledge (Reyes-Garcia et al 2007). Interestingly, some of the most conspicuous food plants such as maize, and the culturally very important Kola nut (*Cola* ssp.) were hardly ever mentioned on free lists, which might indicate that they are “too visible” to be mentioned.

Although the oil palm **teér** (*Elaeis guineensis)* was only mentioned five times on free lists (mainly by men of both age groups) and never in medicinal use contexts, older women praise its medicinal value, and young women rub their infants with it “to make them strong “ and “so they won’t get the cough”.

Plant identification as “practical” plant knowledge took various forms in individuals, and was multisensory, using smell, touch and taste. One young man recognised **nyuri cimi** (*Ageratum conizoides)* as medicine but did not make the connection to the name.

Figure 14. Unidentified bulbous plant at male specialist's house, used against 'spiritual' poisoning (photo R. K.)

While only a few women above the age of 60 knew a particular *Crotalaria* species by its name as **b□□ veéh**, ‘of the women’(*Crotalaria* spp.), its popular use by women in promoting healthy menstruation was widely known among men and women of all age groups. Similarly, certain bulbous plants that are

[34] Unidentified.

used exclusively by men (especially by older men) in the context of 'ritual' medicine (poisoning, charms) are not necessarily known lexically to younger men and women by their specifics, but inter-group sharing of their activity contexts is high. Some of these plants can be found planted next to the walls of peoples' huts, especially around the huts of male specialist healers.

6.1.3 Specialist plant knowledge

The existence of a pool of specialised individuals within the "pool of shared knowledge" became apparent on the trail walks where two specialists in medicinal plant knowledge outscored all other groups in both number of plants mentioned as medicine and the number of their medicinal and 'ritual' uses. It must be noted here that the male specialist mentioned many medicinal plants emphasizing ritual aspects of their use while the female specialist observed a more refined differentiation between the two categories (table 2). She was also the only person who clearly stated that the tree **lií** (*Erythrophlaeum guineense)* had no use, which demonstrates that she did not connect its use in divination with what she perceives as medicine.

Great variation in older men's free lists[35] was found to be related to occupation with regards to carpentry, construction and forestry, and to specialisation in different healing techniques, and men above the age of 60 often mentioned specific plants they employed in their herbal or ritual treatments. This was demonstrated by an 88- year old male specialist in 'ritual' medicine who named three plants that no other participant mentioned, one of them being the tree **luú**[36] the resin of which is used to "chase away the demons".

	number of medicinal plants	**number of medicinal uses**	**number of 'ritual' uses**
Women 1	6	6	3
Women 2	4	4	1
Men 1	7	5	4
Men 2	6	6	3
Female specialist	10	9	1
Male specialist	**11**	**8**	**5**

Table 2. Medicinal plants and plants used in 'ritual' medicine as mentioned on trail walks

[35] See Appendix II, table 14 and 15
[36] Unidentified.

The same plant can take on different names depending on what activity context is stressed. The plant species *Oxalis radicosa* was mentioned by a female specialist with childbirth expertise as **nyuri huaŋ nar** ('childbirth grass') while the same plant was referred to as **nyuri njuar** ('good luck grass') by a male traditional practitioner who stressed the plant's application as a charm. Neither of the two individuals knew the name given by the other.

6.1.4 Flexibility and change

Both lexical and substantive knowledge can be subject to flexible cultural learning, change and revision(Ellen 2003: 62-63). Newly introduced species that are often used as ornamentals because of their flowers, are generally known among all members of the community as "fleur" and form a residual category of culturally uninteresting plants. Some introduced species, however, such as *Titonia diversifolia (***fleur jalusi***)* or plant species that have been adopted from the Fulbe, such as the edible leafy greens **lalu** and **gubudo** [37], are aggregated into the language as loanwords from other languages (mainly French, Fulfulde and Pidgeon English), and are commonly known.

	Informant	**Cut wounds**	**abscess**	**Use unknown**
Women1	1	x		
	2	x		
	3	x		
	32	x		
Women2	9	x		
	18			X
	27			X
	31	x		
Men 1	8			X
	11	x	x	
	20	x		
	26			X
Men 2	12	x		
	23	x		
	25	x		
	33	x		

Table 3. Trail walk data for *Epathorium odoratum*

On the other hand, substantive knowledge of the highly invasive *Epathorium odoratum*

[37] Still awaiting correct identification.

(**bìnjammê**, possibly from the French name Benjamin) as a medicinally valuable plant showed variations among trailwalk participants, especially young women and older men (table 3), signalling a potentially slower inclusion into a generally shared knowledge pool.

6.1.5 Knowledge erosion

Substantive knowledge can also disappear and the lexical link between plant, its use and the term might get lost. This is reflected in the comment " I don't know its use" being more common with younger informants compared with older individuals. Some old women pointed out a grass to me that was used traditionally as a torch but said that "no one knows that anymore", and a younger man knew that the palm species **soú** [38] was very soft, that one is not supposed to cut it, and that it "was used for something in the past"[39].

I also observed some variation between the theoretical and the practical (skill oriented) knowledge concerning particular plant species, which might indicate knowledge erosion. While **njàgà** as a generic name was among the most frequently mentioned plants on both means' and women's' free lists, the identification of its two types caused some difficulties among individuals on the trail walks and also on informal occasions such as during my daily voucher specimen sorts. One young man correctly identified a cultivated type of **njàgà** *(Cyperus articulatus),* and knew its traditional use in the treatment of malaria related fevers, but when his wife fell ill, he admitted his preference for Western medicine from the dispensary (figure 15).

Figure 15. Young boy with njàgà (*Cyperus articulatus*) growing in the village (photo R. K.).

6.2. Informant consensus

Cognitive anthropologists have developed a Concrete, measurable definition of knowledge as agreement among informants (Romney et al. 1986).

When attempting to measure individual ethnobotanical knowledge, one must bear in mind that people will always confer with each other and that responses given by individuals might be artificial, and subject to a multitude of factors including personal attitudes toward the

[38] Unidentified.

[39] It has a very soft wood and was used in funerary rites to cover the body of the deceased before burying it.

research, simply forgetting on the spot, the desire to demonstrate expertise, and so on.

Cluster diagrams of Mambila plant use agreement show, in general, great variation among informants with regards to both uses of plants and trees.[40] However, patterns become more apparent when analysing variations within and among groups.

6.2.1. Consensus among groups

Knowledge of food plants was widely shared among all groups, in particular with respect to cultivated plants (table 4).

Cultivated trees		**Agreement in number of mentions**	**Agreement in %**
maŋgoró	*Mangifera indica*	18	100%
píâ	*Persea americana*	18	100%
Semi-wild trees			
Yoó	*Vernonia amygdalena*	10	55.50%
Wild foods (trees)			
tulu	*Terminalia macroptera*	1	5.50%
tùbù	*Anogeissus leiocarpus*	1	5.50%
mvuúr	*Vitex doniana*	14	77.70%
kékéma	*Pilostigma thoningii*	9	50%
mbikú	Unidentified	16	88.80%
Cultivated plants		**Agreement in number of mentions**	**Agreement in %**
cèb	*Cucurbit* spp	18	100%
njebany□□ŋ	*Solanum nigrum*	18	100%
Wild food (grasses, sedges)			
guií	*Pennisetum purpureum*	5	28%
njieé	*Cyperus procerus*	1	6%

Table 4.Agreement on plants as food (trail walk data)

Interestingly, some of the most conspicuous cultivated and semi-wild food plants (such as corn and oil palm) were only freelisted on a few occasions. On the other hand, cultivated trees that were producing fruit at the time of the study made it onto the "top 22" list of most

[40] See Appendix II, table 15 ,16, 1 and 18.

frequently mentioned plants and showed 100% consensus on names and uses among all groups[41].

All informants unanimously agreed also upon name and use (or in this case non-use) of **kabe,** making it the most salient weed.

High agreement among research participants and other community members existed in the case of introduced species, some of which are being used as ornamentals. Consensus on this species is based on naming them all **nyuri fé** if they are herbs with no known use**,** and **fleur** if they have flowers that make them applicable as ornamentals and for spiritual use as in decorating churches to "chase away the bad". These represent temporally and spatially dynamic people- plant relationships in the sense that people who encounter these plants on their travels or strangers coming to the village (myself included) might bring back new knowledge about them and lead to new levels and degrees of agreement and disagreement as people incorporate these plants into their daily use.

Figure 16. Unidentified 'fleur'. Introduced species that is planted ourside of churches and next to houses to "keep away the bad".

6.2.2. Agreement and disagreement within groups

Consensus within the four groups revealed an interesting pattern. All groups agreed among each other on the uses of the most salient food plants as mentioned above (table 4). Both groups of females showed, in general, more homogeneous agreement on plant uses than men, especially the group of younger men, where variation was high. Interestingly, young men named the same number of medicinal uses as did women above 30, but they did not show high agreement amongst each other on these uses. One 28year old man was the only trail walk participant to mention **nyuri cimi** (*Ageratum conizoides)*, which he could not correctly identify, as a remedy to treat eyes, and he was the only individual in his group to know of the medicinal use of **Kékéma (***Pilostigma thoningii).* Another young man of 16,

[41] See Appendix II, table 13.

who had only moved to the village four years previous to this study, was quite different from the other young men in the sense that he knew of edible roots in certain grasses and sedges, said that he makes brooms out of a plant that everyone else called a weed, and that he was the only person ignorant of the tree **mbikú**[42] being a source of wild food.

Older men and women mentioned more medicinal plants in their free lists than their younger counterparts (table 6), and they were more knowledgeable about ritual uses of plants on the trail walk (fig.12).

	Food	**Firewood**	**Medicine**	**Ritual**	**Constr.**	**Craft**	**Other**
Women 1 (30+)	13	12	25	5	4	0	4
Women 2 (30 -)	22	9	6	1	3	0	1
Men 1(30+)	20	10	25	12	6	7	0
Men 2 (30-)	18	18	17	3	8	5	1

Table 5. Total number of plants in different use categories as mentioned on free lists and on trail walks

Generally, older women agreed on more medicinal uses for plants, while younger women agreed on uses such as firewood and food to a higher degree than medicinal contexts. All women as well as the older men agreed on the ritual use of the plant **libi** (*Sida rhombifolia)*, while only one of the younger men knew of this use.

The pattern of older women's' agreement shows that one woman in her early thirties was both times slightly separate from the other women, who were above 50. This may be because the three older women did the trail walk as a group and conferred among each other on responses, while the younger woman did the walk as an individual. Interestingly, none of the three older women remembered to mention the use of **mvuúr** *(Vitex doniana)* as food, although it is one of the most salient wild foods and is undoubtedly known as such. The younger woman omitting the tree's use as firewood is equally implausible and highlights the fact that measuring plant knowledge in single interviews and formal elicitation techniques can be misleading.

Lower consensus was displayed on the trail walk for certain plant species with medicinal properties, such as **nyuri cimi** *(Ageratum conizoides)* and **bînjammè** *(Epathorium odoratum).* Most of the older women agreed on the medicinal use of **nyuri cimi** while most of the younger women did not know a use for it, at all, while both groups of men showed a 50% consensus on its medicinal use. While older women and men agreed fully on the

[42] Unidentified.

medicinal use context of **bînjammè**, only one young woman and two young men knew of this application.

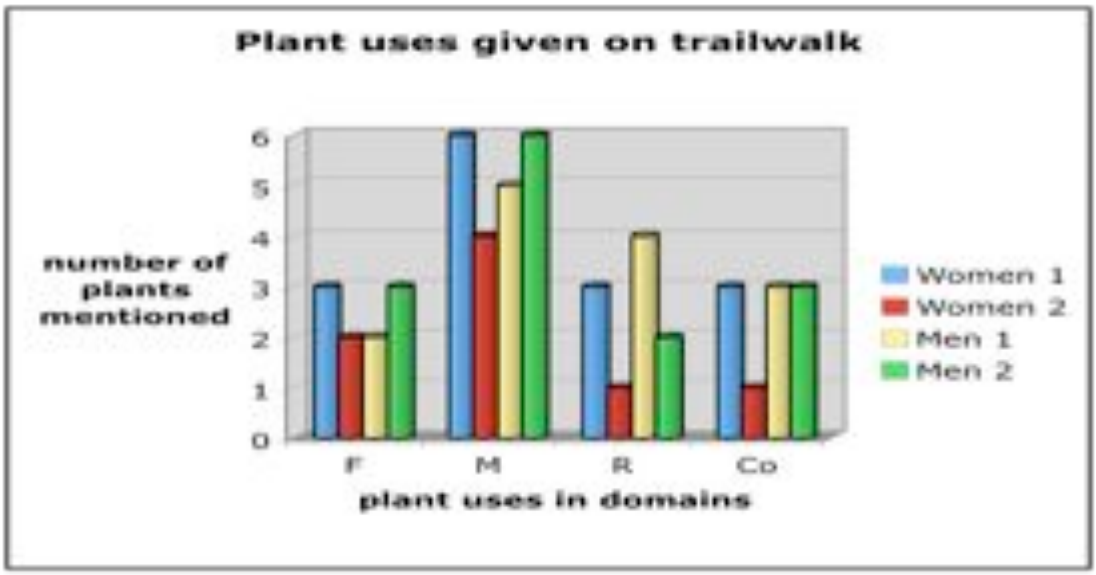

Figure 17. Plant uses mentioned on trailwalks

Agreement on the sedges **njieé** (*Cyperus procerus)* and the two types of **njàgà** *(Mariscus alternifolius* and *Cyperus articulatus)* showed also great variation. **Njieé** was mostly considered a weed and was given different uses only by one older (20-M-52) and one younger man (12-M-16), and knowledge of one type of **njàgà (***Mariscus alternifolius)* as a remedy against malaria related fevers was common among the older participants and the younger men, but showed only a 25% agreement among the younger women.
Some variations in agreement existed also in the case of firewoods, and were more pronounced among the younger participants[43].

One of the most widely distributed plants that is also a marker species of grasslands is the **guií** (*Pennisetum purpureum)*. While all informants showed consensus in naming and identifying this grass, only one older woman, two older and two younger men knew of its use either as food or as a construction material

[43] See Appendix II, table 13

6.2.3 Formal education as an independent variable

The relationship between plant knowledge and the independent variables age, gender and education was analysed through a multiple linear regression model (SPSS software; table 6.8) and was based on informants' knowledge scores (table 5) from the trail walks.

1	no name or wrong	0
1	name generic local	1
2	name/ use	2
3	binomial local/use	3
4	diff. types	4
5	all/use	5

Table 6. Individual knowledge scores based on identifying and naming uses on trail walk:
Sample size: 18 individuals

In the regression results columns I to III correspond to the regressions run. Coefficient values of the regression equation are shown in the cells. P values are shown in parenthesis. A cell with X means that the variable was excluded from the regression.

	dependent variable plant knowledge		
independent variables	I	II	III
Age	**0.2531935 (0.005)**	**0.3377799 (0.001)**	**0.337181 (0.001)**
Gender	3.642564 (0.160)	-0.221205285 (0.911)	X
Education	X	**1.054692 (0.005)**	**1.036044 (0.001)**

Table 7. Linear regression model for the relationship between plant knowledge/ age, gender, education

Model I : regressing age and gender against plant knowledge.
Model II regressing age , gender and education against plant knowledge.
Model III regressing age and education against plant knowledge.

According to this analysis, education was positively correlated with plant knowledge (table 8). However, qualitative observation did not support this analysis and will be discussed below.

Figure 18. A young girl with her certificate of excellence from school. She wants to continue in education (photo R. K.).