



HAL
open science

Color naming in Africa

Guillaume Segerer, Martine Vanhove

► **To cite this version:**

Guillaume Segerer, Martine Vanhove. Color naming in Africa. Raffaelli, Ida; Katunar, Daniela; Kerovec, Barbara. Lexicalization patterns in colour naming: a cross-linguistic perspective, 78, John Benjamins Publishing Company, pp.287-330, 2019, Studies in functional and Structural Linguistics, 9789027204035. 10.1075/sfsl.78.13seg . halshs-01961288

HAL Id: halshs-01961288

<https://shs.hal.science/halshs-01961288>

Submitted on 1 Sep 2022

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Color naming in Africa

Guillaume Segerer, Martine Vanhove

Llacan (UMR 8135, CNRS, INALCO, Université Sorbonne Paris-Cité)

Abstract

This chapter is the first large-scale typological survey of the lexical means used in African languages to express color-related meanings. It is based on a very large sample, with data from 350 languages, most of which come from the *RefLex* online lexical database. It focuses on language internal semantic sources, morphosyntactic strategies, and contact induced terminology used for color naming. After a brief discussion of the issues raised by “basic” color terms, and “polychromatic” color terms, the chapter provides a review of the semantic sources of color terms, the origin of borrowings, colexifications and metaphorical uses of color terms, main patterns of lexicalization, and, briefly, color-related ideophones.

Keywords

Color, African languages, lexicalization, semantics, borrowing

1 Introduction

Some of the main contributions of African languages to the longstanding debate concerning “basic” color terms which followed Berlin & Kay’s (1969) universal, typological and evolutionary approach based on elicitation with the Munsell color chart¹, were (i) to test the method and hierarchy on individual languages or language groups (e.g. Wescott 1970; Tornay 1973; van Beek 1977; Blommaert 1985; Davies & Corbett 1997; Tosco 1999, Zelealem 2016); (ii) question the methods and results, and highlight their limits, eventually challenging the universality of “basic” color terms (e.g. Dimmendaal 1995; Moñino 2004). An overview of the critical arguments (to which we fully adhere) against the Berlin & Kay approach is found in Dimmendaal (1995, 2015); Foley (1997).

The aim of this chapter is both broader and narrower. Narrower because we limit our investigation to bilingual dictionaries which happen to be easily accessible and searchable, mainly thanks to the *RefLex* database (Seegerer & Flavier 2011-2018), a lexical database developed at Llacan and DDL French research units, which contains over 1,140,000 lexical items covering 785

¹ For data, works and references developed in this approach, including over ten African languages, see the *World Color Survey* project.

languages from 1,289 different sources, but broader because we are covering a large sample of 350 languages of Africa (see map in Figure 1).²

INSERT MAP (Figure 1) ABOUT HERE

In compliance with the objectives of this volume, we focus on semantic sources and morphosyntactic strategies used for color naming, and do not address the question of color name inventories (see section 2). The primary reason is that we are dealing with 350 languages, and although we tried to select the best existing sources, great differences remain in terms of lexicon size and reliability. For instance, in the Joola cluster (a group of closely related Niger-Congo languages spoken in southern Senegal), various sources give from three to ten color names and, remarkably, the poorest source is one of the biggest dictionaries available for these languages (Kasa, 4,130 entries, Weiss 1939). Second, color name inventories may be misleading in that they do not really reflect the lexical richness of a language. Such inventories tend to be confined to a number of “primary” colors (in the sense of Berlin & Kay 1969) lexically distinguished in a language. Yet, a language may have few underived terms for “primary” colors but a lot of expressions that distinguish between various shades of these colors: in the biggest Kikongo dictionary (Laman 1936, approx. 25,000 entries), there are 123 different entries with a

² Other comparative studies we know of are more limited in scope: Blommaert (1985) deals with 17 Bantu languages (based on dictionaries), and Zelealem (2016), based on a variety of methods, with 16 languages of Ethiopia (Cushitic, Omotic, Semitic and Nilo-Saharan).

definition involving BLACK, 60 with WHITE and 159 with RED. 43 more entries pertain to YELLOW, GREEN, BLUE, GRAY and BROWN. At the other extreme, the Kol lexicon given in Hanson (2007) has 1841 entries, but not a single color term.

In this chapter we first explain our methodology for data collection (Section 2), briefly discuss the issues of the so-called “basic” color terms, and “polychromatic” color terms (also referred to as “fuzzy set” – Kay et al 1991 – or “composite category” in the literature – Foley 1997) (Section 3). We then provide a review of the various semantic sources of color terms (Section 4), the origin of borrowings (Section 5), the colexification of color terms (Section 6), the different patterns of lexicalization (Section 7). Section 8 briefly discusses the particular case of ideophones and intensifiers used to refer to colors.

2 Data and methodology

The *RefLex* database provided a first set of 197 languages. To get a better coverage of the genetic diversity, we added a second set of 153 languages for which dictionaries, large wordlists in grammars or color-dedicated articles were available to us, or as unpublished data from our own field notes, and

data that colleagues in our research unit and other European institutions were kind enough to share with us.³

The languages were selected on the basis of four criteria: (i) small word lists were excluded (many African languages are only documented through lists of some 30 items up to a few hundreds); (ii) sources lacking either BLACK, WHITE or RED were excluded after careful crosschecking with other sources for the same languages, and in all cases it turned out that it was an omission in the data, not a gap in the language; (iii) for some languages, various sources were available and comparably reliable, but showed important divergence in color naming. These sources were all included as we had no way to decide which one to keep⁴ (unlike Maffi 1990 for Somali who could postulate diachronic evolutions and dialectal variation).

The 350-language sample⁵ is relatively balanced both geographically and genetically:

- 271 Niger-Congo (NC), approx. 15% of NC languages

³ Our special thanks go to Odette Ambouroué, Pascal Boyeldieu, Mark Dingemans, Dmitry Idiatov, Rozenn Guérois, Konstantin Pozdniakov, Nicolas Quint, Serge Sagna, Yvonne Treis, Mark Van de Velde and Alexandra Vydrina. We are also grateful to the two anonymous reviewers for fruitful comments.

⁴ There are 21 languages for which we have two or even three sources.

⁵ All sources and data gathered so far has been made available online at <http://guillaumesegerer.fr/Couleurs/>. The appendix provides only the references to the languages with their genetic affiliation and their sources cited in this chapter.

- 44 Afro-Asiatic (AA), approx. 13% of AA languages
- 28 Nilo-Saharan (NS), approx. 12% of NS languages
- 3 Khoisan (K), approx. 9% of K languages
- 4 “*varia*” (2 Songhay, Sandawe, Laal).

We gathered the color tokens in two steps. We first searched for the color terms with the following meanings: BLACK, WHITE, RED, YELLOW, GREEN, BLUE, GRAY, BROWN, ORANGE, PURPLE, and PINK. These correspond to the eleven “basic” color terms of Berlin & Kay (1969). This choice is purely a matter of convenience for the purposes of comparison, not because we agree with their view. Our aim was not to dwell upon the longstanding debate concerning primary *vs* secondary “basic” color terms, the associated evolutionary hierarchy, or the “Munsell chart” methodology (e.g. Kay & McDaniel 1978; Kay et al. 1991; Dimmendaal 1995), or any of the other issues raised by the definition of “basic” colors as mono-lexemic, non-composite, not restricted to specific classes of objects, or psychologically salient (Berlin & Kay 1969: 6; Hardin & Maffi 1997; see Dedrick 1998 for a discussion). To avoid confusion, we refer to the entries which provide translations with these eleven color terms as “BK11 color terms”⁶, and it will become clear in the Sections below that a good proportion of these terms are not “basic” in the traditional sense.

⁶ As suggested by one of the anonymous reviewers.

We tried, whenever possible, to avoid color terms restricted to specific classes of objects, in particular those specific to cattle. We are of course aware that they play a central role in color denominations in (at least some) African languages (e.g. Dimmendaal 1995; Last 1995) and challenge the Berlin & Kay paradigm, but only the biggest dictionaries mention such a piece of information, and using it would have introduced too strong a bias. With those sources that make an explicit distinction between “generic” color terms and cattle-specific color terms, we felt free to keep only the former. Of course, when no such distinction was recorded (e.g. Turton’s 2008 Mursi dictionary, contrary to Turton 1980, cited in Dimmendaal 1995), we kept all the terms referring to colors. Specific color terms, and especially cattle-specific color terms, would need a dedicated comparative study, far beyond the scope and space limits of this paper.

We are also aware of the existence of additional terms denoting other patterns of appearance such as stripes, spots, multi-colored aspects, brightness, saturation, etc., but here again, for lack of space, we had to leave these terms out of the scope of our study.

In a second step, we searched for color terms that are expressed or intensified with ideophones, an important part of color-related terms in a large number of African languages (e.g. Wescott 1970, Dingemanse in press).

Our corpus is biased in some respects. First, for the vast majority of our sources we have no information about the methodology the linguist used to survey the color terms with the language speakers. It is thus possible that

some translations are influenced by the method employed, by the native language of the linguist, or are due to typos or omissions. For instance in the Bété-French dictionary (Zogbo 2005, approx. 4,500 entries), the entry *pvpv* is translated by ‘white’, but in the French-Bété index, it is the entry ‘yellow’ which is *pvpv*. In Nzema (Aboagye 1992, approx. 2,000 entries), *bɔnyema* ‘green’ is absent in the dictionary, but is mentioned in the appendix on color names. In the closely related South Cushitic languages Burunge, Alagwa, and Iraqw, obvious cognate forms are glossed differently: *qancar* is ‘green; yellow; blue’ in Burunge (Kiessling p.c.), *qantsar* is ‘blue, green’ in Alagwa and there is no word for ‘yellow’ (Mous p.c.), and *qantsar* is only ‘green’ in Iraqw which does not have words for YELLOW and BLUE (Mous et al 2002). Is this due to a real difference between the languages, or to the method employed to gather the color vocabulary? Since such cases are marginal, as a rule, we kept what we found in the sources.

Another problem is that definitions of color terms tend to be vague: a word for GREEN may have UNRIPE as its primary meaning without the dictionary mentioning it, and thus may not be applicable to any object. As our concern was not “basic” color terms in the traditional sense, we decided to keep these items.

Nevertheless, as will be seen in the following sections, this method proved fruitful to discover patterns of lexicalisations for our comparative purposes.

3 Monochromatic vs polychromatic color terms

3.1 Monochromatic color terms

By monochromatic color terms we refer to the tokens that are translated by only one of the BK11 color terms. Since this is the first large scale study for African languages, a few statistical facts may be worth presenting here.

Table 1 provides, for each of the BK11 color terms, the number of sources that have at least one expression for this color (ideophones are excluded at this stage). Note that polychromatic terms (see Section 3.2) are counted once for each color, e.g. if one term corresponds to both BLUE and GREEN, it is counted twice.

black, white, red	374	100 %
yellow	237	63 %
green	259	69 %
blue	220	59 %
gray	123	33 %
brown	108	29 %
purple	43	11 %
orange	29	8 %
pink	29	8 %

Table 1: Number of sources per color term in the sample

BLACK, WHITE and RED are attested in all the sources. The other color terms can be divided into three groups: YELLOW, GREEN and, to a lesser extent, BLUE. These are present in more than half of the sources. GRAY and BROWN come next (over 25% of the sources). Then come the “marginal” colors, namely PURPLE, ORANGE and PINK.

Larger dictionaries tend to have richer color term inventories. However the correlation is far from absolute. For example, the small Dhaasanac lexicon (Tosco 2001, 1,100 entries) distinguishes ten of the BK11 color terms whereas the voluminous Fula dictionary (Seydou unpub., 23,200 entries) has only six.

It must be emphasized that Table 1 gives only a very rough account of the situation. First, some languages have rich inventories for various shades of

focal colors, which cannot be captured by the above table. In addition, three kinds of terms were not included: those for which the meaning was too vague (such as ‘dark’, ‘light’, without any mention of focal color terms), those with a very specialized meaning, and those with a meaning of visual appearance in which color plays a secondary role (e.g. ‘white with black spots’), and which therefore could not be assigned to a focal color (see Section 2). Despite, or because of these restrictions, Table 1 roughly conforms to Berlin & Kay’s hierarchy⁷, except that GRAY is far more frequent than it would be expected (recall that in Berlin & Kay, GRAY goes with the “marginal” terms such as PINK, ORANGE or PURPLE).

3.2 Polychromatic color terms

Table 2 provides an overview of polychromatic color terms, i.e. the color terms translated by several “basic” color terms.

⁷ In its statistical rather than implicational dimension. It would be easy to give examples of individual languages not conforming to Berlin & Kay’s implicational hierarchy, but this is beyond the scope of this paper.

	Black	White	Red	Yellow	Green	Blue	Gray	Brown	Orange	Purple	Pink	%
Black	1094		3		9	28	1	11		4		5 %
White		1044	1	3		1	22	2				3 %
Red	3	1	1108	50	1			40	19	3	13	12 %
Yellow		3	50	396	12	4	6	23	10		5	29 %
Green	9		1	12	399	61	5	4		2		24 %
Blue	28	1		4	61	331	12	5		6		35 %
Gray	1	22		6	5	12	246	15	3	5	2	31 %
Brown	11	2	40	23	4	5	15	248	13	6	5	51 %
Orange			19	10			3	13	63	2	12	95 %
Purple	4		3		2	6	5	6	2	58	1	50 %
Pink			13	5			2	5	12	1	51	75 %
Total	56	29	130	113	94	117	71	124	59	29	38	

Table 2: Polychromatic color terms in the sample

The figures in the gray-shaded diagonal represent the total number of a color term referring to one or more colors occurring in all sources. For instance the translation ‘black’ occurs in 1,094 tokens, representing an average of 3.12 ‘black’ tokens per source. The “total” line corresponds to the addition of all polychromatic terms, whatever the colors involved. The right-hand column gives the percentage of polychromatic terms for each color term as compared to its total number (in the diagonal) of tokens.

The table shows three clear tendencies: (i) the three focal colors, WHITE, BLACK, RED, in this order, are more likely to be monochromatic in African

languages, but less so for RED; (ii) a middle group of color terms which include GREEN, YELLOW, GRAY, BLUE, in this order, tend to be significantly polychromatic (on average 25%) ; (iii) the “marginal” color terms, ORANGE, PINK, PURPLE, and also BROWN in this case, in this order, are the most likely to be polychromatic (over half to almost all tokens for ORANGE).

Table 2 also shows that color terms are polychromatic in various proportions with other color terms regardless of the total number of tokens per color, and in a different way than the preceding grouping: BROWN can be associated to all the other ten terms, followed by GRAY, YELLOW, RED, PURPLE, GREEN, BLUE, ORANGE, WHITE, BLACK, PINK.

If now one takes into account only the highest number(s) of polychromatic terms within each line in Table 1, another grouping emerges. This grouping is based on whether a color can be classified as “warm” or “cold”, or neuter vis-à-vis this classification. In Table 3 the high figures are shaded in gray.

	White	Gray	Red	Yellow	Brown	Orange	Pink	Black	Green	Blue	Purple	
White		22	1	3	2					1		neuter
Gray	22			6	15	3	2	1	5	12	5	neuter
Red	1			50	40	19	13	3	1	1	3	warm
Yellow	3	6	50		23	10	5		12	4		warm
Brown	2	15	40	23		13	5	11	4	5	6	warm
Orange		3	19	10	13		12				2	warm
Pink		2	13	5	5	12					1	warm
Black		1	3		11				9	28	4	cold
Green		5	1	12	4			9		62	2	cold
Blue	1	12	1	4	5			28	62		6	cold
Purple		5	3		6	2	1	4	2	6		neuter

Table 3: Warm and cold colors in the sample

The pairings of polychromatic meanings by category are represented in Figure 2 where the double pointed arrows indicate that for both color terms the polychromy constitutes a majority. A single pointed arrows indicates an asymmetric polychromy: for instance, BROWN has RED as its major polychromy whereas the reverse is not true (RED has YELLOW as its major polychromy). The circles show the two centers of convergence for warm and cold colours.

INSERT FIGURE 2 ABOUT HERE

Figure 2 shows that (i) PURPLE is neuter vis-à-vis the warm/cold categories, and has no favorite pattern of polychromy; (ii) WHITE and GRAY are also neuter, and regularly associated; (iii) RED is the center of many polychromies for warm colors; (iv) BLUE, GREEN and BLACK are more frequently associated

with each other, but not GREEN and BLACK; (v) BLUE is the center for cold colors. Thus in a majority of cases, polychromatic terms occur within the three categories, not across categories.⁸

Some of the polychromatic terms are expected from previous research on the typology of color terms. Such is the case for BLUE and GREEN which are well known to be named by the same term in many languages of the world (GRUE was coined to name this conflation). In the African languages of our sample this represents 12% and 13% of the tokens for GREEN and BLUE respectively. Although in a far smaller proportion, polychromatic terms are also well attested for (DARK) BLUE and BLACK, GRAY and WHITE, BROWN and YELLOW, BROWN and GRAY, YELLOW and RED. RED can also cover the spectrum of BROWN, ORANGE, and PINK (see also Zelealem 2016, for Ethiopia).

Some polychromatic terms are surprising from a cross-linguistic viewpoint. Most of them are artefacts of the definitions in the dictionaries, and/or the way the table was established. For instance, the single occurrences of RED and GREEN and RED and BLUE come from Swahili *eusi*, fully translated in the dictionary by ‘black, dark, of dark hue, including dark blue, dark green and dark red’. Similarly GREEN and PURPLE occur in Tswana *tàlá*, which is actually translated by ‘green, blue, purple’, and in Koegu *mòòlá* ‘purple, gray, green’.

⁸ Concerning languages which associate warm and cold colors under one term, namely YELLOW and BLUE, see Foley (1997: 157) and Dimmendaal (2015: 130-134).

The polychromatic terms for WHITE, BROWN (and GRAY), is also an artefact of our database. Thus, in the seven Dogon languages of our sample, the relevant color term is translated as ‘1. dirty white, off-white, light grey; 2. tan, light brown, while in the eighth language, Landuma, the exact translation of the color term *ferər* is ‘whitish, light gray, light brown’.

4 Semantic sources of color terms

Many color terms (of course not only in Africa, see e.g. English *orange*) are identical to or derived from terms that denote real world objects. This section explores the most common of these metaphorical uses. While we have assumed that color terms being more abstract generally originate from nouns referring to concrete objects, it is very likely that in some cases the relationship is the reverse, that is concrete objects are named after their color. Such is the case for Swahili *ahazari*, *ayazari* ‘green; green leather’, a borrowing from Arabic *axḍar* ‘green’. Unfortunately, the information provided in wordlists and dictionaries is not always sufficient to tear apart the source from the target meaning.

Table 4 provides an overview of the various semantic domains of (sometimes putative) sources of the 487 color terms concerned in the languages of our sample, organized by broad semantic domains in Column 1. Column 2 subdivides them further in a number of lower level semantic domains, and

provides the number of terms concerned. The last line provides the total number of colors. The latter is more numerous than the number of color terms since polychromatic terms are counted for each color they denote.

		Black	White	Red	Yellow	Green	Blue	Gray	Brown	Orange	Purple	Pink
Animal	bird (22)	3	1	5	2	5	3		2	1		
	fish (8)	3	1	1			2		1			
	mammal (19)		1	1	1		2	10	4	1		1
	reptiles (5)			1	1	3						
Body	blood (11)			10	1				1	1		1
	other body fluids (6)				5	1			1			
	body parts (5)	1		1	2				1			
	milk (5)		1		4							
Food	egg yolk (3)				3							
	fat (12)				10					2		
	food (11)			1	3	2			4	1		1
Mineral kingdom	clay (29)		7	5	9				7	1	2	3
	dust (6)		1					3	1	1		
	ashes (26)		1					24	1			
	charcoal (2)	2										
	mineral, metal (9)			1	5			2				1
Sky	cloud, fog (5)							4	1			
	sky (10)		1				9					
	rainbow (1)						1					
Vegetable kingdom	algae (5)					5	2					
	corn (6)				5	1						
	flower (3)		1		2							
	fruit (20)	2		1	3	1	2		8	2	3	
	grass (29)					28			1			
	kola (7)			3	2				2	2		
	leaf (41)					39	1		2			
	leaf; cassava (9)					9						
	leaf; grass (3)					3						
	locust bean (76)				74				1	1		
	mould (2)					2						
	plant (32)	1	1	6	9	5	2	1	4	1	2	
	saffron (13)				13							
	tree (30)	1		5	11	1	2	1	6	2	3	
Cosmetics (2)			1	1								
Disease (4)				4								
Artefacts (10)		2	2				5				1	
Total		13	18	44	170	105	31	45	48	16	11	7

Table 4: Semantic sources of color terms in the sample

In all the languages, the metaphors for BLACK (except in Nzema), and WHITE are only one among the lexical means used to express these two focal colors. For the other colors but RED, metaphors are most often the only lexical means. The vegetable kingdom is the most frequent source of color terms (258), mostly terrestrial terms (253), more rarely maritime terms ('algae', 5). Next, but far behind, come the mineral kingdom (72), then the animal kingdom (54), food- and body-related terms on a par (26 and 27), and atmospheric elements ('sky', 'cloud', 'fog', 'rainbow'; 16). Names of cosmetics, diseases and artefacts (fabrics and jewels) are marginal.

Looking from the color terms perspective, YELLOW is clearly the favorite target for the development of metaphorical terms in languages of Africa, followed by GREEN, then BROWN, GRAY and RED almost on a par.

In the following subsections we review the relationship between semantic sources and color terms in more detail.

4.1 Vegetable kingdom

The vegetable kingdom represents the most common source of YELLOW terms with 119 tokens. The most widespread plant name is the 'locust tree' (*Parkia biglobosa*), or rather parts of it, which is an important tree for nutrition and traditional medicine in Western and Central Africa. The terms used for the color denomination designate either the fruit, the yellow pulp, the dry pod, or the flour extracted from it, or in a few instances its leaves. Here are a few

examples: Ganja *-dóhàanθe* (< *dòhá* ‘powder’, *hàanθé* ‘locust bean’);
Bwamu *dū̀inú*; Bambara *nèré*; Tommo So *yùlò púnó*; Gbagyi *òlò*.

‘Saffron’ (or ‘turmeric’) comes next, but far behind ‘locust bean’, as e.g. in Afar *húrud*, Sandawe *mādzano*, or Lusoga *kyénvú*. Other plant, fruit and tree names are rarer. ‘Corn’ is the source of e.g. *makkə* and *mbəq* in Wolof, and *mbəx* in Laala; ‘ripe banana or plantain’ of *nsule* in Akoose; ‘country-almond’ of *wóló* in Bambara; ‘*Combretum glutinosum*’ (a bush distributed throughout the Sahel, which produces a yellow dye) of *yeey n / yeey ge* in Sereer; ‘lime’ of *liməŋ* in Wolof; ‘*Lannea acida*’ of *səən* in Wolof. In a few instances the plant or tree species is not identified, but the lexicographer mentions that the fruit or the bark are yellow, e.g. Yulu *máac(ə)*, Krahn *sóèh*.

The vegetable kingdom is also the major source of color terms for GREEN. The majority is related to ‘leaf’ (39), sometimes more specifically ‘cassava leaf’ (9), ‘grass’ (28), or are polysemous between ‘leaf’ and ‘grass’ (3): Fonyi *matəjet* ‘thing like leaf’; Bambara *bímá* ‘that contains grass’; Koromfe *fǝfrɛ jagali* ‘fresh leaf’; Lega-Beya *lò-bə̀bè̀là* ‘dry leaf of banana tree’; Fulfulde *bokko-bokko* ‘baobab leaf’; Sango *ngùnzā* ‘cassava leaf’. A few other plant names have been recruited sporadically, e.g. ‘cabbage’ in Kambaata (and other Ethiopian languages, Zelealem 2016), ‘mould’ in Gurene and Mankanya, or ‘moss’ in Jogo. ‘Algae’ is the source for GREEN in Bedik, Gbagyi, Keeraak, Karon, C’lela (GRUE), and Gurene.

The seven occurrences of the ‘kola nut’ as the source of color terms, concern only the four warm colors, RED, YELLOW, ORANGE, and BROWN. In two

instances the relevant color terms are polychromatic. It is ‘red’ in Mofugudur, Jula and Kikongo, while in the latter language another variety of kola nut is used to refer to ‘yellow’. ‘Kola nut’ is used to refer to ‘orange’ in Maninka, and ‘brown’ and ‘red’ in Dii.

Fruit names are also recruited from various species and extended to eight colors, as shown in Table 5.

Color	Fruit
orange	orange; pumpkin
black	monk’s pepper (<i>Vitex</i> sp.); palm nut almond
yellow	lemon; Sodom apple
brown	shea kernel; cowpea; num-num; coffee; calabash fruit
purple	plum; African pear; acacia fruit

Table 5: Color terms from fruit names in the sample

Other plant, mushroom and tree names are sporadically (in one language, sometimes two) extended to all colors but PINK, such as various types of beans, peas, sorgho, indigo, Ficus, cassava, shea tree, henne, moss. For example, ‘indigo tree’ gives either ‘blue’ (Gouro *gālá*, Zarma *sìni*), or ‘purple’ (Wolof *nganj*); ‘moss’ *nìgìnágà* is the source of ‘green’ in Jogo; ‘Sorghum guineense’ *déré* is the source for one of the terms for ‘red’ in Bambara; the ‘root of *Cochlospermum tinctorium*’ (false cotton plant) *kpata’i* is the source of ‘orange’ in Kyanga.

4.2 Animals

Bird and mammal names are the most common animal sources for color terms. The colors they denote obviously depend on the animal's characteristic color, be it its fur, feathers, or beak.

From bird names are derived various color terms, mostly warm ones. Ngbaka-Mab'o alone provides seven of the 22 terms in this semantic category. It is actually the sole language with BLACK, WHITE, and ORANGE terms whose origins are bird names, among other terms for the first two colors. In other languages, bird names are less frequent. For instance Wolof *cɔy* and Fonyi *cɛɛkor* 'green' derive from a type of 'parrot'; Hausa *kiliili* 'green' from the 'greenshank'; Dii *bèd yèggná* 'green' from the 'aisle of the roller'; Acooli *òcwáàk* 'yellow' from a 'yellow weaver bird', Fula (Massina) *wojja* 'be red' from a 'small calao with a red beak', Fang *kula* 'blue turaco; blue', Lomongo *lonkómbé* 'kite; brown'.

As for mammals, gazelle, antelope, oryx and duiker names are the most common sources of color terms, often for various shades of GRAY, in Limba, Acooli, Rumanyo, and Maa, and also BROWN and LIGHT RED in Otetela. In Ik, *kodowa*, a type of gazelle, gives a 'yellowish color', and in Ngbaka, *ngbómò* 'red-flanked duiker' is the source of 'bright red'. In Maa a type of GRAY derives from the 'vervet monkey' *dédè*, and 'light brown' from the 'serval cat' *e-seperuz*.

Fish names mostly depict various cold or neuter colors: Gubaher *fɔɔn* ‘be blue’, and Viya *o-ngono* ‘black, dark color’ derive from the name of the ‘wels catfish’; Nzema *bile* ‘black’ from the ‘mudfish’; Maninka *kàndanfadiláma* ‘light brown’ from the name of the ‘*kàndán* fish’; and Myene *òsóló mé↓ngéè* ‘blue’ derives from a type of shellfish.

Reptile names give either GREEN (in Dii *biig ha’adná*, a type of ‘green snake’), YELLOW (in Bamabara *básá* type of ‘lizard; crocodile’) or BRIGHT RED (in Wolof *xɔnq*, a type of ‘garter snake’).

4.3. Mineral kingdom

Under this heading, we grouped together terms designating various types of clay, mineral, metal and dust.

As Table 4 shows, ‘clay’ is the most important one with 29 tokens. ‘Clay’ is actually a cover term for ‘clay’ and various types of soils, chalk, ochres, kaolin and mud.

The color terms for WHITE derived from ‘kaolin’, ‘chalk’ or ‘white mud’ mainly concern Bantu languages (6/7 tokens), Fang, Kikongo (3 terms), Enya and Viya, and one Ubangi language, Ngbaka-Mab’o.

‘Ochre’ gives ‘red’ in Sar, Bambara (as one of the ‘red’ terms) and Kikongo (3 tokens). In the latter language one of the tokens is polychromatic with ‘yellow’ because the term designates, among other things, a red soil, a reddish clay, and lead chromate (chrome yellow).

Mineral terms are also the source for YELLOW in one Adamawa, one SBB, two Bantu and three Chadic languages. The color terms are derived from terms meaning either 'soil', 'earth' or 'ochre'. The two 'yellow' terms used in Dii also mean 'brown', and in Otetela the 'yellow' term also means 'pink'. BROWN is a monochromatic term in Maninka, Wawa, Kenyang and Digo, all NC languages.

PINK is found in Jula, where the 'clay' term means precisely 'pink mud extracted when digging a well', and in Otetela, where it is polychromatic with 'orange'.

The remaining two terms mean 'purple' in two Bantu languages, Enya and Otetela, and they derive respectively from 'mud' and 'loamy soil'.

The remains of burnt vegetation are also important sources of neuter color terms, in particular 'ashes' for GRAY (24, approx. half of the sources for GRAY), and very marginally for WHITE (1) and BROWN (1), and 'charcoal' for BLACK is also very marginal (2).

As for other metals and minerals, 'copper' is recruited twice, in Wolof for 'yellow', in Duala for 'red'; 'rust' once for 'yellow' in Sereer; 'alum' once for 'yellowish' in Bambara; 'stone' twice in Chakali for 'pinkish', in Swahili for 'gray'; and 'rock' once in Kapsiki for 'gray'.

'Dust' is used three times for 'gray' in Digo, Somali, and Ngas ('white-gray'), once for 'white' in Viya (which has other color terms for 'white'), and 'orange' in Bisa.

4.4 Body-related terms

‘Blood’ is unsurprisingly associated with the RED color. This is the case for various languages, from different families of the Niger-Congo phylum⁹: Mande (Maninka, Bambara), Bantu (Rombo, Kikongo, Duala), Igbo (Igbo) and Bak (Karon). In the latter language it designates more precisely the ‘blood of dog’, and it is polychromatic with ‘orange’. In Kwanyama ‘clot of blood’ is not ‘red’ but ‘pink’. In Chumburung, a specific hue of red is designated as ‘frog’s blood’.

‘Milk’, or more precisely ‘colostrum’, also means ‘yellow’ (Dii; Rumanyo; Acooli, Maa). For the sole instance of ‘milk’ proper, the color term meaning is ‘white’ (Maninka).

Other color terms coming from body fluids are related to ‘vomit’ (Otetela, Fang ‘vomit of bile’; Kapsiki ‘vomit of jaundice’), ‘children faeces’ (Mofugudur; Karon), or ‘children urine’ (Mbuko). In all these languages the color referred to is ‘yellow’; in Otetela it also means ‘brown’. In Iraqw *qantsar* ‘green’ may be related to *qantsa* ‘green contents of small intestines’.

Five languages derive their RED, YELLOW, BROWN or BLACK color terms from a body part: in Bambara *jàbá* ‘female sex’ is one of the color terms for ‘red’; in Meta ‘breast of dog’ gives ‘yellow’, in Digo ‘liver’ gives ‘brown’, in Bongo ‘intestine’ (associated to a fish name) gives ‘yellow’, and in Tene Kan *gǎ* ‘gallbladder’ gives ‘black’.

⁹ Also in some AA and NS languages of Ethiopia (Zealelem 2016).

4.5 Food

We have grouped here terms that designate different types of dishes, egg yolk and oil. The last category groups together ‘oil’ and ‘fat’ extracted from plants, animals, and other unknown origins. The color terms concerned are only YELLOW (9) and ORANGE (2). Palm oil is attested in five languages (Sango, Kikongo, Otetela ‘yellow’; Ciluba, Idzing ‘orange’). In Otetela *emambamamba* is more precisely ‘dregs in palm oil extracted without the fibers and hardly any water’. In three languages, the origin of the oil is not specified: Longando *bosáká* ‘oil from which water hasn’t been separated as yet’, Bassa ‘fried oil’, and Ijo (Nembe) ‘oily’. Three languages have YELLOW terms that come from animal fat: Uduk ‘oil of cow, Nzema ‘fowl fat’, and Buem ‘chicken fat’.

In Ngbaka-Mab’o and Otetela palm nuts cooked as soups or sauces may be recruited to express color terms, e.g. ‘soup of charred palms’ > ‘red’; ‘soup of palm nuts’ > ‘yellow, orange’ (Ngbaka-Mab’o); ‘sauce of palm oil’ > ‘brown’ (Otetela). ‘Pea crushed with palm oil’ is recruited for ‘yellow’ in Duala; ‘malt flour’ for ‘brown’ in Buli; a kind of ‘leaf sauce’ for ‘green’ in Bedik. ‘Chocolate’ gives ‘brown’ and the ‘honey of a type of ant[s]’ gives ‘light brown’ in Maninka.

4.6 Atmospheric elements

‘Sky’ is the most common term in this category that enters in the composition of color terms. It gives as expected a BLUE color term in nine languages (e.g. in Swahili, Kambataa, Kapsiki), but in Degema it means ‘white’.

‘Cloud’ and ‘fog’ usually give ‘gray’ (Somali, Bambara, Lunda). In Bisa ‘light brown’ may derive from ‘fog’.

In one instance the BLUE color is related to the word for ‘rainbow’ (Akoose).

4.7 Other sources

The two tokens labelled ‘cosmetics’ actually refer to types of paste whose natural origin is not specified, and could well be classified in the category of ‘mineral kingdom’: ‘red’ is ‘a red paste rubbed on the skin by women in fattening-room’ in Degema, and ‘yellow’ is the ‘name of a yellow substance used in ceremonies’ in Bakwe.

In the category ‘disease’, one finds only YELLOW and the source term is either ‘jaundice’ (Bambara; Bwamu), ‘malaria’ (Degema), or ‘yellow fever’ (Moore).

Material or cloth dyed in either ‘blue’ (sometimes ‘indigo blue’) or ‘white’ are polysemous with the color terms themselves.

In the jewel category, one finds only RED in Ngbaka-Mab’o (< ‘red bead’) and in Longando (< ‘leg-ring’).

Not mentioned in Table 4 is Mbuko *jíjjáy* which is recorded as polysemous for ‘brown’ and ‘light’.

5 Borrowings

145 color terms from 99 languages were identified as (potential) borrowings from other languages, either by the lexicographers or by ourselves.

Table 6 provides the number of borrowed color terms per color, ordered by frequencies.

Blue	Yellow	Green	Orange	Black	White	Red	Brown	Purple	Gray	Pink
98	17	14	6	4	4	4	2	2	1	1

Table 6: Borrowings of color terms in the sample

Some of the color terms are polychromatic and have been counted once for each color (ORANGE is also YELLOW or GRAY, while GREEN is three times also BLUE). Most of them are loans from French or English (88), followed by Hausa (12), Arabic (9; 2 ultimately from Hindi), Ethio-Semitic (6), Pular (5), Dendi (4), Moore (3), Fula (2). Lingala, Omotic, Portuguese, Datooga, **Jula**, Bambara, Swahili, Bantu, and Karimojong provided only one borrowing each, and five terms are given in the sources as probable borrowings from unknown languages.

5.1 Blue

BLUE is the most frequent borrowed color term (98). Most of the borrowings (79) come from either English *blue* or French *bleu*, e.g. Bakwé *plù*, Krim *bùlù*, Ma'di *bùlùù*, Nalu *buluu*, Samo-Maya *bola*, Sereer *bule*, Toro Tegu *bulà*, or Wolof *bulɔ*. Sometimes the lexicographer specifies that the loan came via a blue washing powder or a blue dye, e.g. Koromfe *bola*. Some of the 'blue' loans actually go back to European trademarks of clothing whiteners: Mankanya *uniilu*, Ma'di *zákārì*. BLUE is borrowed from Hausa in two other Chadic languages (Guus, Zodi) and two Adamawa languages (Peere, Mbum), from Dendi (Songhay) in three Mande languages (Bokobaru, Busa, Kyenga). There are two attestations of borrowing from Arabic (one ultimately from Hindi) in Swahili, and one from Bambara, Karimojong, and Pular in Kagoro, Soo, and Kakabe respectively.

5.2 Green

GREEN is represented by fourteen borrowings (and three of them actually mean GRUE). Unlike BLUE, the source languages are very diverse (compared to the number of tokens), and European languages form a minority: (i) four come from Hausa into other Chadic or NC languages (Bole; Fulfulde (GRUE); Mbum; possibly Gade); (ii) three come from English (Myene, Herero; Sherbro); (iii) two from Arabic (Somali; Swahili); (iv) two are intra-Gur borrowings from Moore to Koromfe (one is a case of GRUE and appears as a

simple and a reduplicated form, the other actually comes from a noun meaning ‘crushed leaves of baobab’); (v) one is an intra-Mande loan from Jula to Seeku; (vi) the last one is a borrowing from French *bleu* with a meaning change to ‘green’ in Kagoro (BLUE in this language is an intra-Mande borrowing from a Manding variety).

5.3 Yellow

There are fifteen loans for YELLOW: Central Cushitic languages Bilin, Kemant, and Xamtanga have four borrowings from neighboring Ethio-Semitic Ge’ez; Somali and Aiki have a borrowing from Arabic *asfar*. English, Pular and Lingala are also sources for this color term; the Lingala term actually means ‘refined palm oil’ in Sango.

5.4 Other colors

The other borrowed color terms are more sporadically attested in the language sample. There are six for BROWN: three from French *kaki*, the color of military uniforms, one from French *chocolat*, one from English *brown* in Sherbro, one from Amharic *bun* ‘coffee; brown’ in Gedeo.

There are a few borrowings for WHITE: a putative Omotic borrowing in Awngi, one from Ethio-Semitic in Bilin, one from Arabic in Swahili, a putative one from a Bantu language in Ngbaka Ma’bo; two for RED from

Arabic and Hausa in Swahili and C'lela. There are also two borrowings for PURPLE from Arabic and Dendi, and one for PINK from Hausa.

6 Colexification of color terms

In this section we group color terms which are polysemous, but for which we generally had no way to decide which semantic domain was the source, and which was the target of a metaphorical extension, even if in some instances, we had a strong impression that it is the color term that have developed other meanings. For instance, it is probable that the direction of semantic extension is from the color term to another meaning when the adjectival or noun form denotes only a color, while the derived verb denotes an additional meaning. Even if in some cases in the subsections below we hypothesize a direction of the meaning extension, in order to avoid inducing false interpretations, we use a more neuter term, *colexification* coined by François (2008: 171), who distinguishes between *strict colexification* understood as “the capacity, for two senses, to be lexified by the same lexeme in synchrony”, and *loose colexification* which also includes diachronic semantic change, derivation, composition, and etymologically related terms.

Because of the way the RefLex database is organized, we may have overlooked some of the colexifications. Consequently the figures provided in

the following subsections for the less frequent colexifications may be underestimated, but the overall proportion is probably close to reality.

In what follows we present the most common patterns of colexification, leaving aside those that occur once or twice, as they could be just a result of coincidental homonymy.

6.1 Colexifications with 'ripe', 'raw', wet

The colexification of color terms with either RIPE or UNRIPE (or RAW or UNCOOKED), is the one most frequently mentioned in our sources, but to different extents for the two semantic domains. There are 83 attestations for RIPE with either RED (62), YELLOW (8), BLACK (8), or WHITE (5), and not even half that many (32 times) for UNRIPE, with GREEN (and once with GRUE). Moreover, in most sources it is unclear whether RAW really means GREEN, or whether it is an artefact of the French or English translation. There is no doubt when the lexicographer explicitly mentions that the polysemous term refers to the color green or provides an example, but this represents only a minority of cases, e.g. in Dii, Kikongo, Kenga, and Ngbaka. Therefore, the extent of colexification of GREEN and UNRIPE is to be taken with care. In the translations, such colexification is mentioned for 32 languages in three phyla: 23 languages in ten families of the NC phylum (e.g. Nzema, Mambay, Akan, Swahili), four languages in two families of the AA phylum (Ngizim, Bade, Bole; Bilin), and five languages of the NS phylum (e.g. Yulu, Logo, Soo).

The terms for GREEN are also sometimes translated by ‘fresh’ (Ganda, Liberian Kpelle, Lunda, Laal), most often in addition to ‘unripe’ (Sar, Lunda, Akan, Ngizim, Dii) and/or ‘wet’ (Yao; Ngizim, Dii). Similar doubts as before arise regarding the real semantic status of GREEN. For only two languages we are sure that it is indeed the color that is denoted by the lexical item. In Dii, *vé’ed* is translated as 1. ‘uncooked’ (peanuts, yam, couscous); 2. ‘unripe’ (fruit); 3. ‘fresh’ (grass) = ‘green color’. In Giryama, the noun *chanikitsi* is translated by ‘greenness’, and the lexicographer mentions that the last two syllables *-itsi* mean ‘unripe, fresh’. For this particular language, we can reasonably think that ‘unripe’ is probably at the origin of the extension to the green color. But for Ganda, Liberian Kpelle, Lunda, Laal, Yao, Sar, Lunda, Akan and Ngizim, that GREEN really denotes a color remains to be proved. The problem is similar for the other eight putative colexifications of GREEN and WET. Only for Koalib are we sure that *ikli* ‘wet’ indeed means ‘grue’ (Quint, p.c.).

The antonym of WET, DRY, colexifies with RED in only one language, Kikongo: *lōoka* ‘be(come) red’ is ‘be(come) dry’ for red leaves, meaning that DRY is a secondary meaning with very limited combinatorial.

As for RIPE, the rare colexifications with a color term other than RED may depend on the color of the fruit when ripe. The information is not always provided in the sources. It is mentioned only for Kikongo, Cebaara and Day for ‘ripe’ and ‘black’, Longando for ‘ripe’ and ‘white’, Otetela for ‘ripe’ and

‘yellow’. We may suppose, without certainty, that it is also the case for the other colexifications of RIPE with these colors.

For RIPE and RED the authors sometimes mention that the colexification only applies to certain types of fruits (e.g. Banjal, Sar, Wawa, Toro Tegu), or that it is primarily used for RIPE (Siwu), or even that RIPE covers a large spectrum of colors from YELLOW to RED, BROWN and BLACK depending on the fruit (Ngbaka-Mab’o), so that one may wonder if the term *mōkō* really refers to a color, especially since the language has also other terms for RED.

On the other hand, a few languages have different terms for different colors associated to ripeness: in Fang, there are two terms, *vele* “if the fruits become red or white”, and *vine* “if they become black”; in Liberian Kpelle *kpɔlu* (or *kpɔlɔ*) is ‘to be red, glowing, yellow, ripe’, and *mɔ* (or *mɔŋ*) is ‘to be red, ripe, done; to roast’. The sources generally do not mention whether these ‘reds’ apply to anything else but fruits.

RIPE and RED mainly occur in NC languages (60) from various families, but only in two languages in AA (Bade and Ngas) and one in NS (Jur Modo).

6.2 Colexifications with ‘pure, clean’ and ‘dirty’

There are 54 occurrences of colexifications of WHITE, PURE and/or CLEAN in 39 languages of all phyla: AA (1, Mofu-gudur), K (1, Jul’hoan), NC (31) and NS (5). Almost all languages, except Basaa (which has two terms), Jula (Odiene), Igbo, Nyamwezi and Susu, have at least one other monosemous

lexical entry for WHITE. It is thus possible that in most cases PURE or CLEAN are the origin of secondary terms for WHITE and that those terms should have been discussed in Section 4.

The meaning DIRTY is colexified with BLACK 33 times in 28 languages (3 AA, 21 NC, 3 NS), twice with GRAY in two NC languages (Bambara, Jaad), once with DARK BROWN in Kapsiki (Chadic, AA). In one third of these languages, only the verb form is translated by ‘be black, be dirty’, but the adjective or noun form is only mentioned as meaning ‘black’ (Attié, Jur Modo, Lumun, Mada, Mundu, Noni, Sango, Southern Samo, Zaar). For most of them, there is another term (verb, adjective or noun) for ‘(be) dirt(y)’ except in Liberian Kpelle and Mmen. Therefore, it may be the case that BLACK is the source of DIRT(Y) in a good number of languages and not vice-versa. Lelemi has only one polysemous verb form ‘be black, dirty’.

6.3 Colexifications with terms for personality traits

The colexification of color terms with terms for personality traits occurs in 20 languages, 19 NC and one AA (Afar). The vast majority of cases involve the color WHITE (14), mainly with positive traits, such as kindness, honesty, sincerity, innocence, chastity and sanctity (Afar, Bambara, Buli, Cebaara, Kikongo, Mambay, Minyanka, Nugunu, Nyakyusa, Swahili, Tupuri). In three languages, WHITE is associated with negative traits, such as jealousy in Ngbaka-Mab’o, and contempt, humiliation in Gbaya-Kara and Nugunu.

Three occurrences of BLACK are colexified with negative traits, such as nastiness (Fonyi), miserliness (Viya) and unsophistication (Bisa). But in Zimbabwe Ndebele unsophistication is associated with GRUE. Two occurrences of RED are colexified with either positive or negative traits, such as ‘being welcoming’ (Nalu), and ‘being selfish, mean’ (Bambara) respectively. The sole occurrence of GRAY is colexified with a negative trait, viz. ‘unlucky’ (Fulfulde).

6.4 Colexifications with terms for emotions and affects

The few emotions colexified with color terms are all negative ones.

RED colexifies with ANGER in Joola Fogy and six Dogon languages. In Dogon, RED is clearly the source of the semantic extension, since the emotional value is formally derived from the color term by affixes, compounding, or particular syntactic constructions, whereas in the color term no such additional formal means are involved. Nor are formal means involved in the colexification of ‘black’ with ‘pain, affliction’ in Beja, with ‘discontent’ in Jul'hoan and Lunda, with ‘sadness’ in Somali, and of ‘yellow’ with ‘fear’ in Gbaya-Kara.

6.5 Colexifications with terms for evaluative judgements

Evaluative judgements occur in eight languages (3 NC, 5 AA) with BLACK, WHITE, and RED, and may be positive or negative for the same color,

depending on the language. In Alagwa and Iraqw, ‘good-looking, nice’ is associated to ‘black’ in the former and to ‘white’ in the latter. But in Idzing ‘black’ is ‘ugly’. In Beja ‘white’ is positively associated to ‘excellent’, while in Hausa, ‘black’ colexifies with ‘bad’. ‘Important’ or ‘abundant’ are associated to ‘red’ in Sura, Bwamu and Bambara (Mande), but to ‘black’ in another Mande language, Odienne Jula.

6.6 Colexifications with terms for truth value judgements

Three color terms, WHITE, RED and GREEN are colexified with terms for truth value judgements in seven languages (1 AA, 1 NS, 6 NC). The first two colors are associated with positive judgments: ‘certain; white’ in Cebaara, Bambara, Mandinka and Maninka, ‘obvious; white’ in Afar and Soninke. ‘White’ is also associated with ‘true’ in Cebaara, but in Samo-Maya it is the color ‘red’. Kanuri is the sole language where a color term is colexified with a term for a negative truth value judgement: ‘green’ is also ‘false’.

6.7 Colexifications with terms pertaining to sensory modalities

Color terms belong to the vision sense, but they are sporadically polysemous with two other sensory modalities, mostly with the tactile sense and rarely with the gustatory sense. In Bekwel *zwònzwòn* is ‘white; smooth’, in Kikongo *bòbakana* is ‘red; really soft’, and in Ciluba, *cisengasenga* is ‘gray’ and ‘rough’. In Lomongo, one of the terms for ‘green’, *bombamba*, is also ‘hard’

(especially for trees). In other languages evaluation of temperatures mostly colexifies with ‘red’ for ‘warm, hot’: Yoruba *kpó*, Rundi *gu-tukura*, Eton *và*, Fyem *fofá*. ‘Green’ is ‘cold’ only in Akposo (*wlá*). As for the gustatory sense, the sole case is in Bambara where *bási* is ‘red; lumpy, bitter, astringent’.¹⁰

6.8. Colexifications with supra-natural, dangerous or remarkable beings

WHITE designates an ‘albino’ in Bushoong (*ncwèèky*), and Lomongo (*ema*), a ‘mythical being’ in Viya (*mo-ndɔngɔ*), and a ‘character wearing a mask and a raffia loin cloth’ in Viya (*mo-nɔmbɛ*). In Bambara, *nsórobilé* ‘brown orange’ is a ‘dangerous man’ or a ‘ginger-haired person’.

7 Patterns of lexicalization

Dictionaries and wordlists are often far from being specific about word morphology and word categories. For this reason, in what follows we only discuss the cases where authors provided the necessary grammatical

¹⁰ This is an emblematic example of the limitations of dictionary definitions. As an anonymous reviewer pointed out, “the color term is not (or at least not directly) related to the quality verb ‘be bitter, be astringent’. Its source is the word *bási* ‘blood’ (...). Furthermore, as a color term the noun *bási* denotes a ‘dirty yellow, brownish color, rather than red’.”

information themselves or where we could easily deduct it from the sources or from our own knowledge of a language or a language group.

7.1. Noun class alternation

Color terms that come from another semantic domain may be integrated in the color denomination system by a noun class marker shift in languages which have the morphological device, as Atlantic and Bantu languages. For instance in Nyamwezi *lò-dòótö* ‘green’ belongs to class 11, but *ì-dòótö* ‘leaf’ to class 5. Similarly in Viya *o-mbulu* ‘purple’ (noun) is class 11, but *Ø-mbulu* (noun) ‘blue turaco’ is class 9. In Fonyi, *ε-čekör* ‘parrot’ (class E), shifts to class MA (that of abstract nouns) to denote the ‘green’ color, *ma-čekör*. In Banjal, the noun *bu-xomboŋ* ‘locust bean’ produced a color term *e-xomboŋ* ‘be yellow’ (class E of infinitives). In Rumanyo, *lihengá* ‘colostrum’, class 5, shifts to class 7 for ‘yellow color’ *shi-nalihengá*.¹¹ For another color term in Rumanyo, there is no class shift *per se* but an extra noun class marker is added to the class marker of the source term: *n-tjéfu* ‘eland’ (class 9) > *shi-n-tjéfu* ‘gray color’ (*shi-* = class 7). In some cases, the process of lexicalization to a color term has involved an intermediary stage. In Fonyi the noun *ka-tɔj* ‘leaf’ yields the verb *-tɔj-ɛt* ‘be (like) a leaf = be green’, which in turn yields the noun *ma-tɔjet* ‘green color’.

¹¹ *na* is of unknown origin. One of the anonymous reviewers suggested that it may be related to ‘be with’ or ‘with’ which often has the form *na* in Bantu languages.

7.2. Reduplication

In the languages of our sample, reduplication may have several functions. It can be used to derive a color term from a word with a different meaning (7.2.1). The color terms themselves may be reduplicated to express higher (7.2.2) or lower (7.2.3) intensity of the color in question.

7.2.1 Derivation of color terms by reduplication

One of the functions of reduplication, full or partial, with the possible insertion of extra phonemic material, is to mark the meaning change to a color term in a number of languages, e.g., in Bushoong *fɛj* ‘oil’ > *fɛj á fɛj* ‘yellow’; Akoose *mɔl* ‘oil’ > *mɔlmóle* ‘yellow’; *vvu* ‘ash’ > *ki-vuvvu* ‘gray’; Bole *bùto* ‘ashes’ > *butbùto* ‘gray, ash-colored’, *mocci* ‘locust bean’ > *momocci* ‘yellow’; Kom *mighi* ‘yellowish type of liquid sodium bicarbonate, drained out of wood ash’ > *mighi-mighi* ‘be yellowish’. In Sandawe *!’úpha!* ‘gray’ is related to *!’úpha* ‘ash’, but actually derives from its plural form which is also reduplicated *!’úpha!* ‘ashes’. In Bokobaru *kpà* ‘nééré, locust bean’ > *kpà’ikpa’i* ‘bright yellow’, some additional sense is marked by this pattern, here intensification.

7.2.2 Intensification

Intensification may be the function of reduplication of color terms. Such is the case in Bade *hēta* ‘white’ > *hethēta* ‘very white’; Akan *tūmm*, *tūntūm* ‘black, dark, dark shades of red, brown, blue, green’ > *tuntūuntu(m)* ‘very black’; Krahn *ylè* ‘black’ > *yle yle* ‘very black, very dark’; Ngbaka-Mab’o *pí* ‘black’ > *pípí* ‘pitch black’. In Toura, only the color terms ‘white’, ‘black’ and ‘red’ can be reduplicated, once or twice, to provide an intensive meaning: *tíí* ‘black; any dark color’ > *títíí*, *títítíí* ‘very black’; *púú* ‘white’ > *púpúú*, *púpúpúú* ‘very black’; *těě* ‘red’ > *tětětěě*, *tětětětěě* ‘very red’.

7.2.3 Attenuation

The most frequent function of reduplication in our language sample is to attenuate the intensity of the color denoted by a color term. From the information provided in the sources, it is not possible to figure out if, in a given language, this device is systematic or limited to some color terms, but we have not found a single instance of the former possibility. Some examples are Ma’di *wàrà* ‘brown’ > *wàrà wàrà* ‘brownish’; Ibibio *ɲwèèn* ‘become black’ > *ɲnwèèn ɲnwèèn* ‘blackish, blackened’; Kikongo *lu-mpèmbe* ‘whiteness; whitish’, *lu-mpèmbe-mpēmbe* ‘a little bit of whiteness’; in Bole *bùl* ‘yellow’ can be fully reduplicated once and have the same meaning, *bulbùl* ‘yellow’, but further partial reduplication results in an attenuative meaning: *bubulbùl* ‘yellowish’. In Ngwo two colors are reduplicated: *blā*

‘white’ > *blāblā* ‘whitish’, and *fān* ‘red’ > *fārāfān* ‘reddish’ (with a change *n* > *r* and insertion of *ā*). In Hausa, more colors can be attenuated by reduplication: *bákíí* ‘black; very dark green; very dark blue’ > *bákí-bákí* ‘blackish’; *shúúdí* ‘work of dying blue; blue’ > *shúúdí-shuudí* ‘lightish blue’; *dòòrawà* ‘locus bean tree’ > *dòòrawà-dòòrawà* ‘light-yellow’; *háýáák’i* ‘smoke’ > *háýáák’i-háýáák’i* ‘brownish, khaki’.

7.3. *Compounding and genitive phrases*

Compounding and genitive phrases are grouped together as accurate information about these two constructions are not always provided in the sources. For our purposes, it suffices that they both involve at least two elements from two different semantic domains. Some semantic domains are recurrent and could easily be split into sub-headings, while others are particularly remarkable and deserve a sub-heading of their own even though they may not be widespread. The “*varia*” sub-section gathers idiosyncratic sources of color terms.

7.3.1 *Color of*

Genitive phrases or compounds involving the generic term ‘color’ to create color terms is attested in several languages from different branches of the Niger-Congo phylum. Associated with either ‘grass’, ‘vegetable’, ‘leaf’, or ‘manioc leaf’, it denotes the color GREEN: Cebaara *nyàāpírigē cére* lit. ‘fresh

grass color’, Mba Ndunga-le *ngùnjá ngòmè* lit. ‘color of vegetable’, Mba-ne *ábōkīndá ngómé* lit. ‘color of manioc leaf’, Eton *nǒl í kpàm* ‘color of fresh manioc leaves’, Ngwo *ēzóró égé* lit. ‘color pasture’. In Bakwé *nápōjīārēnū* ‘green’ is based on *nápō* ‘leaf’ + *nū* ‘color’ and an unidentified element. In Degema *adǒ ábitaŋ wɔwɔ* ‘green’ is tentatively proposed by the author as a contraction of *adǒ ubí ótaŋ wɔwɔ*, lit. ‘color leaf tree fresh’.

Other semantic domains as the source of color terms of this type are more sporadically attested: ‘color of sky’ gives ‘blue’ in Ngwo *ezóródí ezob* (classified as an adjective), lit. ‘color sky’; in Eton *nǒl í dǒb* is lit. ‘color of sky’. ‘Color of charcoal’ *dùgúwǒǒ cére*, categorized as a compound noun, is the origin of one of the two terms for ‘black’ in Cebaara; and Cebaara is the sole language of our sample which explicitly mentions ‘color’ as an element of a compound with the widespread ‘locust bean flour’ for ‘yellow’, *nánmiigē cére*. ‘Yolk color’ occurs once for ‘yellow’ in Ngwo *ēzóró étáá ākôn kʷā?* (*ēzóró* ‘color’, *étáá* ‘heart’, *ākôn* ‘egg’, *kʷā?* ‘chicken’)¹².

For some languages, color terms contain the generic term for ‘color’, but there is no independent entry for the remaining element; it is thus impossible to decide whether they are real compounds with another existing element, or not: Mba Ndunga-Le *mólàngà ngòmè* ‘yellow’; Limbum *nǚò kàkár* ‘green’ (*nǚò* ‘color’), Obolo *ùŋʷúnùŋʷán* ‘yellow’ (*ùŋʷán* ‘color’), Ngwo *ēzóró mbārāŋʷò* ‘green’, and *ēzóró cʷáfàn* ‘brown’.

¹² Zelealem (2016: 66) mentions *kekino* ‘yellow’ derived from *keko* ‘fried yolk of egg’.

7.3.2 *Water of*

Compounding with a noun phrase meaning ‘water (of)’ is a frequent device in Chadic languages. Zaar has *zà-k rāās* ‘yellow’ (lit. ‘water of locust bean tree’), *zà-k pààtsá* ‘green’ (lit. ‘water of leaf’), *zà-k gáluúrā* ‘blue’ (lit. ‘water of a plant with a tuberous rhizome’), *zà-k nāállē* ‘dark brown’ (lit. ‘water of henna’). In other Chadic languages, only one color term of this sort is mentioned: Zodi *fà bakáŋ* ‘green’, Guus *zà kə waldǎ* ‘green’ (lit. ‘water of leaves’); Mofu-gudur *yám ngá gwáraw* ‘orange’ (lit. ‘kola water/juice’).

This strategy is sporadically attested in NC languages. Lingala has two color terms formed that way: *mái ma mpɔndú* ‘green’ (lit. ‘water of manioc leaves’), *mái ma lilála* ‘orange’ (lit. ‘water of orange’). In Fon *fě* is a blue powder used to dye loincloth and to brighten washing and *fě sìn* ‘blue’ is lit. ‘blue powder water’. In Dendi *sùbù hári* ‘green’ comes from *sùbù* ‘bush; grass’ and *hári* ‘water’, and in Adele *èkònlé ù bütù* ‘yellow’ is lit. ‘tree sp. his water’.

7.3.3 *Plants*

Color terms coming from the vegetable kingdom are often associated with another term to denote the color meaning.

A common association is ‘fresh grass’ for ‘green’ in NC languages (see Section 5.1): Nanga-dama *sàwà òrí* lit. ‘fresh grass’; Mbum (Adamawa) *hòì*

fókó lit. ‘grass fresh’. In Mokpwe the verb for ‘be green’ is actually a copulative construction where ‘grass’ is the subject and ‘fresh’ the attributive predicate: *βèwùlé βè φéjá* lit. ‘grass is fresh’. ‘Leaf’ can also be associated with ‘fresh’ as in Meta’ *ìfù zwi* ‘green’, lit. ‘fresh leaf’.

In Mandinka *jàmbàkéré* ‘(be) green’ is the result of the compounding of *jàmbà* ‘leaf’ with *kéré* ‘raw’, and in Rundi *akátsi ga-tóto* ‘green’ of ‘pulp of stalk’ with ‘leaf’.

For YELLOW we already mentioned ‘locust bean flour’ in Section 5.1. Here is another example from Mandinka where *nètémúnkù* ‘(be) yellow’ is made of *nètè* ‘locust bean’ and *múnkù* ‘powder, flour’.

In one language, Fang, the compound for ‘chocolate colored, garnet colored’, *ésvisvi-akona*, associates two plant-related nouns: *ésvisvi* ‘heart of the raffia bamboo’, and *akona* ‘fruit of *ngon* (a type of gourd) which has a chocolate color when well ripe’.

7.3.4 *Body of*

Compounding with a term meaning ‘body’ is sporadically attested in several branches of NC. In Jamsay *yàrù-màná jèjú* ‘blue’ is lit. ‘sky body’; in Bakwé *bàbē-fūgbā* ‘brown, bronze color’ is lit. ‘bronze-body’; in Mandinka *sée-bálà* ‘gray’ is lit. ‘shea-body’ and *pòtò-bálà* ‘grayish’ is lit. ‘mud/clay-body’. It should be noted that in none of the sources for these languages there is a

polysemous term ‘body; color’, a polysemy which is attested in other languages, e.g. Cebaara, Nzadi, or San.

7.3.5 *Body fluids*

In some Chadic and Bak languages, the terms for ‘faeces’ are associated with terms referring to animals or an infants. ‘Yellow’ in Mofu-gudur *záy-bázey* is lit. ‘faeces of child’, and in Joola Karon *wat añi* is ‘faeces-child’. Zelealem (2016) also mentions it for languages of Ethiopia.

7.3.6 *Body parts*

Few languages associate body parts of animals to denote a color. In two cases the related color term is YELLOW: Meta’ *ìbàn i bu* is lit. ‘breast of dog’ and Bongo *ìkí gòrò* is intestine of *gòrò* ‘a type of fish with a yellow intestine’. In Mofu-gudur, the related color term is LIGHT BLUE *lakwáy-duwak* ‘testicles-monkey’ (also in Cushitic Kulisi, Zelealem 2016: 64).

7.3.7 *Oil, fat*

OIL or FAT can be used in compounds to refer to the color YELLOW: Bassa *dāā-càná* lit. ‘fried oil’, Nzema *akɔɛ enlome* lit. ‘fowl fat’.

7.3.8 Combination of two color terms

Beja is the sole language in our sample that associates two color terms to give a third one. If *hadhamif* ‘blackish-grey’, made of *had* < *hadal* ‘black’ and *hamif* ‘ashy, dirty-white (of camels)’ comes as no surprise, the combination of *ádar* ‘red’ and *sóota* ‘green’ to give *ádarsóotay* ‘yellow’ is more remarkable as it corresponds to the physiological process of color perception in the eye (called “additive synthesis”).

7.3.9 Varia

A few other languages have very idiosyncratic compounds. In Akoose BLACK occurs in genitive phrases to express other colors: *ehinde é byaá* ‘green’ is lit. ‘black, dark of leaf’, *ehinde é ngubélen* ‘blue’ is lit. ‘black of rainbow’. In Bassa *h^wúē-jèdè* ‘green’ is ‘mildew-monkey’. In Mbum *blú násará* ‘blue’ is lit. ‘blue European’. In Sar *əgā-dāy-déw* ‘red color’ is lit. ‘prevent the Day people to hide’ which is a reference to a ‘war between the Sar-s and the Day-s who were killed in a marigot where they were trying to hide’.

7.4 Similitive adpositions

Chadic and Ubangi languages make use of constructions with an explicit similitive adposition. In Mofu-gudur *yám ngá gwáraw* ‘red’, categorized as a compound noun, is lit. ‘like kola water/juice’. In Mbuko *kawa azay sa wan* ‘yellow’ is lit. ‘like the faeces of a child’; in Mofu-gudur *ma məkaday sa wan*

‘yellow’ is lit. ‘like the urine of a child’, and *mba mburom* ‘blue’ is lit. ‘like the sky’. In Ngbaka-Mab’o *bàá.kpáā.náā* ‘green’ is ‘like a tree leaf’, *bàá.kpáā.bó* ‘yellowish green’ is ‘like a banana leaf’, and *bàá.kpákpáā* ‘green’ is ‘like foliage’.

7.5 Affixation

Affixation is not a common device for color naming in our language sample. It is only attested in three languages. Interestingly, in Kambaata it is the highly productive similative suffix *-gud* (not an adposition as in the languages mentioned in 7.4) which is used to derive color terms from other semantic domains: *hamiila-gud*- ‘green’ (lit. cabbage-like), *buna-gud*- ‘(dark) brown’ (lit. coffee-like), *bonxa-gud*- ‘green’ (lit. leaf-like), *samaa-gud*- ‘blue’ (lit. sky-like) (the process is also known in other Ethiopian languages (Zelealem 2016)).

Kakabe (as well as other Greater Manding languages), has a special suffix *-lama* (*ma* is originally a similative device¹³) which occurs only with three color adjectives derived from other semantic domains. The three color terms concerned are *yànba-lama* ‘green’ < *yànba* ‘leaf’, *fíta-kende-lama* ‘green’ < *fíta* ‘leaf’ + *kénde* ‘unripe’, and *néte-lama* ‘yellow’ < *nète* ‘locust bean’.

¹³ We thank one of this anonymous reviewers for this information.

7.6 Diminutives

In our language sample, four languages provide evidence that diminutives may be used as attenuatives of focal color terms. In Beja, there are two color terms: *eera* ‘white’ > *eela* ‘a little white’, and *adar* ‘red’ > *adal* ‘pink, light red, light brown’; in Tswana there is only one: *-hibidú* ‘red’ > *hibitswánà* ‘pink’. Kikongo has more. Excluding the dialectal phonetic variants, Laman’s (1936) dictionary provides four color terms with the diminutive suffix *-(l)uluka*: *lòmba* ‘black’ > *lòmbuluka* ‘be a bit dark, black; be blackish’, *bènga* ‘ginger, light’ > *bènguluka* ‘be reddish, yellow, etc.’, *bwàka* ‘be(come) red, yellow’ > *bwàkuluka* ‘be(come) reddish, brown’, *nánzò* ‘red’ > *nanzóluluka* ‘light red’. In Kom, a diminutive suffix is attested with one color verb, *bàŋ* ‘be red’, as a way to attenuate the intensity of the color: *bàŋlì* ‘be reddish’.

8 Ideophones

A working definition of ideophones can be that of Ameka (2001: 26): “ideophones are a phonosemantic class of words with expressive and imaginistic semantics”. This definition makes no assumption about morphology or syntax. We could add that in general, ideophones have a

limited combinability, many of them being attached to a specific verb. The linguistic features that define ideophones in various languages may vary a lot. However, similar semantic properties of ideophones can be found in a number of languages. This is especially true in the domain of colors.

One problem we had to face when sorting the data, was that this word type may not be labelled as “ideophone” in our sources, and we had to search for other equivalents such as “intensifiers” or “attenuatives”, or decide by ourselves that a color term was indeed a member of this category when no word category was indicated. Furthermore in some instances, the specialist of a language may disagree with our analysis or terminology, and consider that the terms belong yet to another specific class, different from the more common word classes such as nouns, verbs, adjectives, or adverbs (see e.g. Roulon-Doko, this volume, for Gbaya-Bodoe and her use of ‘adjective-adverbs’). Within the scope of this paper, we counted as ideophones (i) those labeled as ideophones (or an equivalent term such as ‘adverbe expressif’ in Bambara for instance) by the authors; (ii) any modifier which combines only with a specific color term, generally with an intensifying or attenuative meaning. In some sources however, the information provided does not allow the use of any of the above criteria. In those cases, we arbitrarily counted as ideophones lexical items that looked phonologically atypical (for instance, reduplicated forms as Bini *ɾɛ̃ɣɛ̃ɾɛ̃ɣɛ̃* ‘pink, light red’) or semantically specific (for instance, Longando *tolí* ‘black, very black’).

Among the 350 languages of our sample, at least 106 have dedicated ideophones in the domain of color, which makes a corpus of nearly 1,000 ideophones (counting only ideophones for focal colors, i.e. not ‘multicolored’, ‘spotted’, and the like).

As Table 7 shows, the color ideophones are not evenly distributed color-wise.

Color	Black	White	Red	Green	Yellow	Blue	Gray	Other
Nb of id.	314	283	324	26	11	7	15	6

Table 7: Proportion of ideophones per color in the sample

The three “basic” colors, BLACK, WHITE and RED, concentrate nearly all the ideophones. This might be due to the fact that these color terms are typically verbs, and that ideophones typically modify verbs. Interestingly, each one of the 106 languages which have color ideophones have in average 3 different ones for each of the three BLACK, WHITE, and RED colors. In very large dictionaries however, we can find many more ideophones than in smaller ones. For example, the Bambara dictionary by Dumestre (2011) has nine different ideophones for BLACK, sixteen for WHITE and fourteen for RED, but none for the other colors.

The vast majority of color ideophones are intensifiers, i.e. they are used to emphasize the hue of a color. This can be achieved in various ways:

- The ideophone can be used with only one color term adding emphasis:

Keeraak (Segerer, pers. fieldnotes)

(1) *kajilɔɔnak kɔkɔ kɔmɔ kɔhutɔm far*
rooster this COPULA white IDEO

‘This rooster is really white!’

Maninka (Creissels 2013: 111)

(2) *sáŋ-o be fín-dij kílǒ*
sky COPULA be black IDEO

‘The sky is very dark.’

- The ideophone may be a predicate:

Dii (Bohnhoff 2014: 264)

(3) *zǒm ɔn mbàà vìm*
empty land burn COPULA IDEO

‘Burnt grass is black’

- The ideophone may also modify a stative verb whose primary meaning is one of low intensity only, not including color, as in Tima (Schneider-Blum 2013)

-*héh* (classified as an adjective by the author) ‘light’:

àhéh kàrìndì ‘light yellow (like millet)’

àhéh wèlwèl ‘light blue’

àhéh káyì ‘grass green’

Much more could be said about ideophones in African languages, but this would go far beyond the scope and limits of this paper (see Segerer and Vanhove in prep. for further details).

9 Conclusion

Our study is analogous to big data studies where “noise” (here biases) is compensated by quantity. We have surveyed 374 lexical sources corresponding to 350 African languages, looking for the strategies used for color naming. For a number of reasons pertaining to the reliability of the data (exhaustiveness of inventories, disparity between number of entries in sources, possible omissions, absence of indication of methodology, etc.), the question of color inventories has not been really addressed here. Instead, our research focused on the strategies African languages use to name colors. Metaphorical uses of nouns, borrowings and colexifications were given special attention, as well as patterns of lexicalization. Derivatives and ideophones were only briefly treated and will deserve much more detailed investigation in future research. One of the main conclusion of this very large survey is that there is not much that can be considered specifically African as far as strategies for color naming are concerned. Still, a few local patterns emerge, such as the naming of YELLOW after the tree *Parkia biglobosa* (locust tree) attested throughout West Africa, the massive borrowing of BLUE from

European languages, the (rarer) cases of borrowings from neighboring languages of GREEN, and the tendency to get polychromatic terms within but not across the warm/cold distribution of colors. Apart from a few idiosyncratic cases, patterns of lexicalization, metaphors and colexifications of color terms do not deviate from general crosslinguistic tendencies and borrowing of color terms is not particularly frequent (except for BLUE). Moreover, although some patterns of lexicalization may be more specific to certain language groups (e.g. ‘water of’ in Chadic or the colexification of ‘ripe’ and ‘red’ in Niger-Congo), none is particular to any of them and they are attested (sporadically) in other language groups for which areal patterns due to language contact could not easily be deduced and further research is needed. Textual analysis would also be an interesting approach for future research, but this is not an easy task for a large scale study. One solution would be to examine texts in languages for which big corpora are available (e.g. Bambara) and compare the results with those extracted from the dictionaries.

References

(except data sources, see Appendix)

Ameka, Felix K. 2001. Ideophones and the nature of the adjective word class in Ewe. In *Ideophones*, E. F. K. Voeltz & C. Kilian-Hatz (eds), pp. 25-48. Amsterdam & Philadelphia: Benjamins.

- Berlin, Brent and Paul Kay. 1969. *Basic color terms: their universality and evolution*. University of California Press. Berkeley and Los Angeles. (First Paperback Edition: 1991).
- Blommaert, Jan M. E. 1985. The semantics of Bantu colour terms. *Grazer Linguistische Studien* 24: 63-75.
- Davies, Ian and Greville Corbett. 1997. Colour categories in African languages: A test of the Berlin & Kay's theory of colour universals. In *African Linguistics at the Crossroads: Papers from Kwaluseni*, R.K. Herbert (ed.), pp. 581-598. Köln: Rüdiger Köppe.
- Dedrick, Don. 1998. *Naming the rainbow*. Dordrecht: Kluwer Academic Publishers.
- Dimmendaal, Gerrit. J. 1995. Studying lexical-semantic fields in languages: nature versus nurture, or where does culture come in these days. *Frankfurter Afrikanistische Blätter* 7: 1-28.
- Dimmendaal, Gerrit. J. 2015. *The Leopards Spots. Essays on Language, Cognition and Culture*. Leiden, Boston, Brill.
- Foley, William A. 1997. *Anthropological Linguistics: An Introduction*. Oxford: Blackwell.
- François, Alexandre. 2008. Semantic maps and the typology of colexification: intertwining polysemous networks across languages. In *From polysemy to semantic change*, Martine Vanhove (ed.), pp. 163-215. Amsterdam, Philadelphia: Benjamins.

- Hardin, C. L. and Luisa Maffi. 1997. Introduction. In *Color categories in thought and language*, C. L. Hardin and Luisa Maffi (eds.), pp. 1-20. Cambridge: Cambridge University Press.
- Kay, Paul, Brent Berlin and William R. Merrifield. 1991. Biocultural implications of systems of color naming. *Journal of Linguistic Anthropology* 1: 12-25.
- Kay, Paul and Chad K. McDaniel. 1978. The linguistic significance of the meanings of basic color terms. *Language* 54: 610-646.
- Last, Marco. 1995. *A Sketch of Chai*. M.A. thesis, Leiden University.
- Maffi, Luisa. 1990. Somali color term evolution: Grammatical and semantic evidence. *Anthropological Linguistics* 32 (3/4): 316–334.
- Moñino, Yves. 2004. Une autre conception des lumières: Sur les noms des couleurs en gbaya. In *Du terrain au cognitif: Linguistique, ethnolinguistique, ethnosciences. A Jacqueline M.C. Thomas, Elisabeth Motte-Florac & Gladys Guarisma (eds.)*, pp.241-265. Leuven, Paris: Peeters.
- Segerer, Guillaume and Sébastien Flavier. 2011-2018. *RefLex: Reference Lexicon of Africa*, Version 1.1. Paris, Lyon. <http://reflex.cnrs.fr/>.
- Segerer, Guillaume & Martine Vanhove. In prep. Areal patterns of color naming in the languages of Africa.
- Tornay, Serge. 1973. Langage et perception: La dénomination des couleurs chez les Nyangatom du sud-ouest éthiopien. *L'Homme* 13(4): 66-94.

- Tosco, Mauro. 1999. The Color Terms of Dhaasanac. In *Afroasiatica Tergestina. Papers from the 9th Italian Meeting of Afroasiatic (Hamito–Semitic) Linguistics*, Marcello Lamberti and Livia Tonelli (eds.), pp. 381–392. Padova: Unipress.
- Turton, David. 1980. There's no such beast: cattle and colour naming among the Mursi. *Man* 152: 320–38.
- van Beek, Wouter E.A. 1977. Color terms in Kapsiki. In *Papers in Chadic Linguistics*, Paul Newman and Roxana Ma Newman (eds.), pp. 13–20. Leiden: Afrika-Studie centrum.
- Wescott, Roger W. 1970. Bini Color Terms. *Anthropological Linguistics* 12(9): 349–360.
- World Color Survey*. <http://www1.icsi.berkeley.edu/wcs/>. Accessed 02 April 2018.
- Zelealem Leyew. 2016. The Description of Colour Terms in Ethiopian Languages. *Eastern Africa Social Science Research Review* 32(2): 53–86.