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Naming strategies and ethnobiological nomenclature in Kakataibo (Panoan, Peru)[1]

ABSTRACT: The present paper describes and illustrates the main naming strategies attested in a lexical database of 1233 Kakataibo names of plant and animals. Seven naming strategies are proposed for Kakataibo ethnobiological nomenclature: coining, morphological derivation, borrowing, ethnobiological polysemy, compounding and grammatical nominalization (the latter two being exclusively associated with lexically complex forms). Kakataibo ethnobiological terminology overally follows the general word-formation patterns available in the language, but it will be argued that some types of compounds and grammatical nominalizations found in the database are constraint to names of plants and animal. Indeed, one particular type of lexicalized grammatical nominalization seems to be cross-linguistically unusual.
KEYWORDS: Kakataibo; Pano; Ethnobiology; Nomenclature; Naming strategies.

RESUMEN: Este artículo describe e ilustra las principales estrategias para la creación de nombres atestiguadas en una base de datos léxica de 1233 entradas asociadas a la terminología de plantas y animales en kakataibo. Se proponen siete estrategias: acuñación, derivación morfológica, préstamos, polisemia etnobiológica, composición y nominalización gramatical. La terminología etnobiológica kakataibo sigue esencialmente los patrones de formación de palabras del kakataibo, pero se puede argumentar que algunos tipos de compuestos y nominalizaciones gramaticales encontrados en la base de datos son exclusivos de los nombres de plantas y animales. En efecto, entre ellos encontramos nominalizaciones gramaticales lexicalizadas que parece ser tipológicamente inusuales.
PALAVRAS CLAVES: Kakataibo; Pano; Ethnobiología; Nomenclatura; Estrategias de nominación.

[1] The present paper is a product of a one-year documentation project on the ethno-biological knowledge of Kakataibo people (Proyecto n° 70242.2024, "Etno-biología de los Kakataibo: una aproximación al saber sobre la naturaleza de un pueblo amazónico peruano"), funded by the Pontificia Universidad Católica del Perú (PUCP). I am enormously grateful for their support. I would also like to thank the Kakataibo speakers who helped with the elaboration of the lexical database used in this paper (see Table 1 in this paper). I also thank David Fleck for revising a previous version of this paper and two anonymous reviewers for their valuable comments.

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1. Introduction

Linguistic ethnobiology deals primarily with the naming of animals and plants by different ethnic groups. The scientific relevance of ethno-biological systems for naming animals and plants used by traditional societies was first noted by Lévi-Strauss (1966: 153-154), who remarked that people from these societies are able to remember an impressively large number of lexemes that designate the flora and fauna in their surroundings. While Western scientific taxonomy has standardized rules for labeling scientific species and higher categories, indigenous peoples utilize multiple different strategies for naming their local flora and fauna, which are of linguistic and cognitive interest. The present paper contributes to the understanding of folk biological nomenclature by describing the most salient linguistic strategies used by the Kakataibo people (Pano, Peru) for creating animal and plant names. This study is based on an ethnobiological lexical database with 1233 lexical entries, elaborated by a collaborative research team that included linguists, biologists and Kakataibo people. This database includes preliminary biological identifications for approximately 70% of the species listed, as well as detailed descriptions gave by the Kakataibo people for approximately 60% of them (see also Winstrand 1984).

This paper has been organized in the following way: in section 2, I present some basic information on the Kakataibo people and their language; in section 3, I describe the methodology this paper is based on; in section 4, I briefly present the typologies of ethnobiological nomenclature available in the literature; and in section 5, I describe and illustrate in detail the different naming strategies attested in our database. Finally, some conclusions are offered in section 6.

2. The Kakataibo People and their language

The Kakataibo people (also known as “Cashibo”, “Cacataibo” and “Uni”, among other denominations) belong to the Panoan language family and live in the Peruvian regions of Huánuco and Ucayali, mainly along the Aguaytía, Shamboyacu, San Alejandro and Sungaroyacu Rivers. According to the most recent Census of Indigenous Communities of the Peruvian Amazon (INEI 2007), currently the Kakataibo people number about 1879. However, the Kakataibo’s political organization Federación Nacional de Comunidades Cacataibo (FENACOCA) considered their number to be closer to 3,000 in 2007.

Kakataibo is the westernmost Panoan language and, therefore, the one closest to the Andes Mountains. Shell (1965), d’Ans (1973), Loos (1999) and Fleck (2013) coincide in treating this language as the only member of its branch. As described in Zariquiey (2011b), the Kakataibo language has four extant dialects, spoken respectively in the Lower Aguaytía/Shamboyacu, the Upper Aguaytía, the San Alejandro and the Sungaroyacu rivers. The data upon which this paper is based comes from the dialect spoken in the Lower Aguaytía/Shamboyacu rivers. See the map in Figure 1.

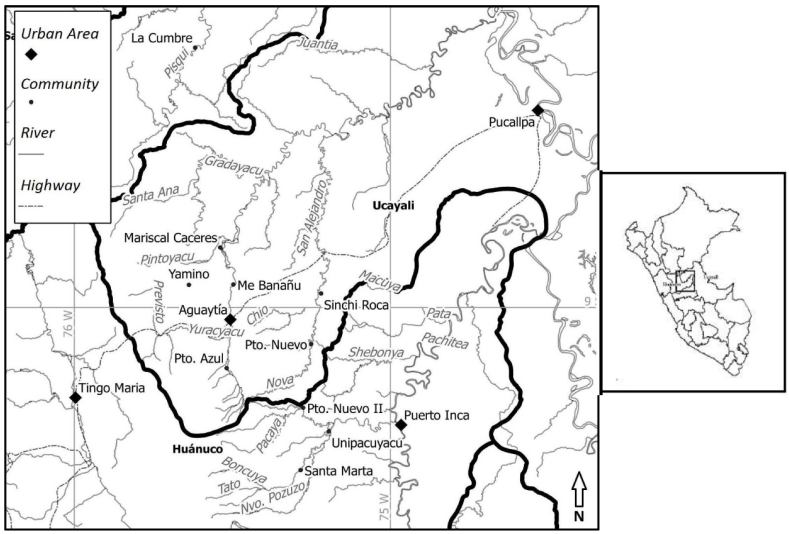

Figure 1: Location of major Kakataibo settlements

In terms of its syntactic profile, Kakataibo is a (mainly) postpositional and agglutinating language with a highly synthetic verbal morphology. The language shows both head and dependent marking, and a complex system of grammatical relations, which includes tripartite, ergative, accusative and neutral alignment types. Verbs are lexically transitive or intransitive (with only 4 ambitransitive verbs in the whole language) and trigger interesting processes of transitivity harmony and agreement. Word order can be considered pragmatically-oriented, but there is a tendency toward verb-final sentences. There is no fixed order in the noun phrase, and most modifiers (including adjectives, numerals and demonstratives, but not modifier nouns) are allowed to appear after or before the head. Other relevant features include the existence of a rich system of switch-reference used in clause-chaining, as well as the systematic presence of tail-head linkage structures and the pervasive use of nominalizations in discourse.

3. Methods

One of the objectives of the documentation project upon which this paper is based was to develop a collaborative fieldwork situation, in which Kakataibo speakers were incorporated as local researchers and not just as experimental subjects. Thus, the project has promoted the development of a local research team, composed of 8 members of the community of Yamino (5 men and 3 women), who have participated in different ways in the activities included in our project: group walks into the forest, preparation of a multi-authored ethnobiological dictionary, biological identification of species, audio and video recordings of cultural knowledge and mythology about salient plants and animals, and so on. The Kakataibo members of the local research team, their roles and their approximate ages are listed in Table 1.

Table 1: Members of the local research team

Name	Age	Rol
Alfredo Estrella	75	story-teller, dictionary-maker, ethno-taxonomist, plant specialist
Emilio Estrella	90	story-teller, plant specialist dictionary-maker, ethno-taxonomist, singer
Karen Estrella	38	fieldguide, translator, plant specialist
Goliat Estrella	23	fieldguide, translator, interviewer.
Irma Vásquez	65	story-teller, plant specialist dictionary-maker, ethno-taxonomist, singer
Magaly Estrella	40	fieldguide, translator, interviewer.
Ricardo Odicio	64	story-teller, dictionary-maker, ethno-taxonomist, plant specialist
Ricardo Pereira	71	story-teller, dictionary-maker, ethno-taxonomist, plant specialist
Salomón Estrella	85	story-teller, dictionary-maker, ethno-taxonomist, plant specialist
Wilton Odicio	38	fieldguide, translator, interviewer.

Our research team followed methods suggested by Fleck (2007) for obtaining scientific designations for plant and animal names in a research language when it is not possible to collect voucher specimens. Initially, lists of animal and plant names were compiled from research sessions with the Kakataibo members of our local team, and augmented with plant and animal names that appeared in recorded texts, during group walks into the forest, and in Winstrand (1984). Some names were also overheard during residence in Yamino and were also incorporated into the database. Subsequently, these names were associated with biological species (or higher-level biological taxa) and new names were elicited using drawings or photographs in field identification guides (Emmons 1997 for mammals; Schulenberg et al. 2000 and 2007, and Clements and Shany 2001 for birds; Bartlett and Bartlett 2003 for reptiles and amphibians; Henderson et al. 1995 for palms; and Goulding et al. 2003 for fish), simultaneously discussing the natural history of the species and playing recorded vocalizations if available (Emmons et al. 1997 for mammals; Schulenberg et al. 2000 for birds; and Cocroft et al. 2001 for frogs).

In turn, higher-order groupings are based on a total of 24 hours (in eight sessions of three hours each) of group discussion about the relationship among different animals and plants and their organization. These sessions of group discussion were led by the author and always included the participation of at least five Kakataibo people (including up to three community members who were not part of our local research team). This allowed us to validate the results obtained in the frame of our collaborative research team. Men and women worked separately due to cultural preferences. The methodology of these group sessions consisted in giving the participants a number of topics to discuss (fish, parrots, monkeys, palms and so on). They were asked to construct an agreed-upon organization of the category under discussion based on the names proposed by them and the ones that we have previously documented. I led the discussion and took notes on A2 sized pieces of papers, using markers of different colors. This method allowed us to offer a first approximation of the internal structure of a considerable number of taxa, from unique

beginners to generics. Finally, the results of this research were returned to the community in public sessions, were the author and the members of the local team launched a multi-authored ethnobiological dictionary and the video and audio recordings gathered in the frame of our project. All these materials were given back to the community in two PC computers that were donated by the Pontificia Universidad Católica del Perú (PUCP) to the community of Yamino and are currently in the community primary school.

4. Name types vs. naming strategies

Although the notion of naming strategy as understood in this paper (see Section 5) is relatively new in the ethnobiological literature, the classification of ethnobiological terms into types has been an important topic since very early. One major distinction in these different typologies has to do with the distinction between simple and complex term. Conklin (1962), for instance, distinguishes two types of biological labels: **unitary labels** and **composite labels**. Unitary labels may be of two classes: **simple** and **compound**. The essential distinction between composite labels and compound unitary labels in Conklin's terms is that composites exhibit what he calls **descriptive force**; for instance, the composite term *white oak* reveals that the referent is a type of *oak* that is characterized by being lighter-colored than other oaks. By contrast, compound unitary labels lack **descriptive force**; for example, the compound unitary label *copperhead* is not the name of a type of a *head*, but of a type of snake. Berlin et al. (1973) and, more recently, Berlin (1992) elaborated on Conklin's (1962) proposal, introducing an additional distinction to produce a partially divergent typology, which is summarized in Figure 2 below, in which I follow the terminology used by Berlin in his 1992 monograph.

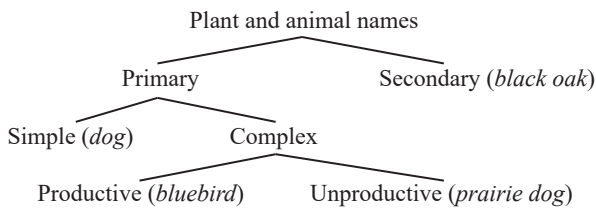

Figure 2: Berlin's (1992) typology of plant and animal names

As we can see, one important difference between Conklin's (1962) typology and Berlin's proposal has to do with the introduction of one additional distinction within the category of primary complex labels, which are divided into productive and unproductive. The distinction between productive complex names and secondary names is only based on taxonomic criteria (secondary names only contrast with other secondary names and never with primary names; see Berlin et al 1973: 217). In Zariquiey (2014), I have discussed the problems of combining taxonomic and linguistic criteria in the classification of ethnobiological names, when we pay attention to the actual contrast sets in which these names co-exist.

In this paper, I assume a crucial distinction between **name types** and **naming strategies**. With the former term, I refer to the classes or types of names, as proposed in the nomenclature typologies, such as the ones summarized above. In turn, with **naming strategies**, I refer to the linguistic processes by which names of different types have been created. Let us compare the English terms *copperhead* and *anteater*. Although both terms are compounds, in *copperhead* we find a Noun (*copper*)-Noun (*head*) construction ($[N\text{-}N]_N$), in which the first noun is modifying (qualifying) the second one. In turn, in *anteater* we find a nominalized construction with *-er* ($[N\ [V]\text{-}er]_N$). Notice, however, that the terms *anteater* and *copperhead* would be considered of the same type in the nomenclature typology presented in Figure 2: in both cases, we have a primary complex term of the unproductive subtype. Linguistically, however, the naming strategies involved in each case are different. As far as I know, the distinction between name types and naming strategies has not been previously been proposed in the ethnobiological literature. In this paper, I exclusively focus on naming strategies and not to how they interact with the typologies just described.

5. Naming strategies in Kakataibo

In what follows, I analyze Kakataibo ethnobiological names with respect to the grammatical processes involved in their creation. As I have mention in section 4, I label these processes as **naming strategies** to distinguish them from the name types that Conklin (1962) and Berlin et al. (1973) and Berlin (1992) proposed in their typologies of ethnobiological nomenclature. Most of the distinctions to be presented here are irrelevant for Conklin's and Berlin's typologies (though some have been described in the ethnobiological literature; e.g., onomatopoeia in Berlin and O'Neill 1981).

The first of the naming strategies to be discussed is what I call **coining** (section 5.1), understood here as the creation of a name based on an arbitrary association of form and meaning. The second is **morphological derivation**, whereby a root is modified by a bound morpheme, producing a single morphologically complex word (section 5.2). The third one is **borrowing** from surrounding languages (Spanish and Shipibo-Konibo) (section 5.3). The fourth strategy is **ethnobiological polysemy** (see Zariquiey 2014), whereby a term referring to one ethnobiological category/rank is used to refer to another one (section 5.4). The next strategy to be discussed is **onomatopoeia**, which takes part in different types of constructions (section 5.5). Note that onomatopoeia is similar to coining with the only difference that the association between form and meaning is not totally arbitrary, since onomatopoeic names attempt to reproduce the vocalization of birds or frogs. The last two naming strategies to be discussed in this paper are **compounding** (section 5.6) and **grammatical nominalization** (section 5.7).

One important point to be highlighted is that the naming strategies to be discussed here largely correspond to the general word-formation strategies available in Kakataibo (Zariquiey 2011: 176-187). However, some types of compounds and nominalizations are exclusively found in Kakataibo ethnobiological terminology. This is true regarding two out of the three derivative suffixes to be presented in section 5.2. This constitutes a fascinating case of grammatical specialization directly associated with the semantic domain of animals and plant names. Furthermore, some of the grammatical nominalizations to be discussed here exhibit a high degree of lexicalization that seems cross-linguistically uncommon.

From the 1233 names included in the database this paper is based upon, 599 (48.6%) correspond to lexically simple names and 634 terms (51.4%) correspond to lexically complex names. In the database, there is a total correlation between lexically simple terms and the naming strategies of coining, morphological derivation, and borrowing (all the cases of coining, borrowing and morphological derivation in the database result into lexically simple names). In turn, ethnobiological polysemy and onomatopoeia are involved in both lexically simple and complex names. Finally, compounding and grammatical nominalization are exclusively involved in the creation of complex names.

5.1. Coining

In this classification of the naming strategies attested in the Kakataibo ethnobiological taxonomic system, I reserve the term **coining** for cases of non-onomatopoeic and non-borrowed morphologically simple terms. A majority of the lexically simple terms in our database satisfy all these criteria and, therefore, exhibit this naming strategy. Some examples of coining are offered in Table 1.[2]

Table 2: Some examples of coining in Kakataibo

Kakataibo	English	Scientific
‘abu	great egret	*Ardea alba*
‘amën	capibara	*Hydrochoeris hydrochaeris*
‘ishmin	king vulture	*Sarcoramphus papa*
maxú	common opossum	*Didelphis marsupialis*
xëtsi	armadillo	*Dasypus kappleri*

[2] The orthographic conventions followed in this paper are: *a*, *e*, ë [ɨ], *i*, *o*, *u*, *p*, *t*, *k* [k], *kw* [kʷ], *b* [β, w], *r* [ɾ], *m*, *n*, *ñ* [ɲ], *s* [s, z], *sh* [ʃ], *x* [ʂ], *ts* [t͡s], *ch* [t͡ʃ] and *’* [ʔ]. In turn, the following conventions are used for names that have been identified only to the genus level: sp. = names that refer to only one biological species (of a genus), but it has not yet been identified; spp. = names that refer to more than one species (of a genus); and sp(p). = names known to refer to at least one species (of a genus), but it is not certain whether they refer to more than one species of the genus.

5.2. Morphological derivation

Three suffixes systematically appear in lexically simple terms in our database of Kakataibo plant and animal names: the augmentative *-on ~ -an,* the generic *-ina(k)* and the suffix *-kuni* 'genuine'. While the former two are obligatory in the names in which they appear, forms with *-kuni* 'genuine' alternate with non-morphologically derived forms (i.e. *ru ~ ru-kuni* 'red howler monkey (prototype)'). Additionally, with very few exceptions, the augmentative *-on ~ -an* and the generic *ina(k)* are exclusively found in ethnobiological terminology.

The 'augmentative' marker *-on* (~ *-an*) is used very often in the taxonomic system of Kakataibo and is perhaps the most widely used derivative morpheme. Two important properties of this suffix should be mentioned here. First, the use of this suffix does not derive a name that refers to a larger specimen of the same class (like in *dog* vs. *large dog*), but to a specimen that is considered by the Kakataibo as belonging to a different (but related) class (like in *dog* vs. *wolf*). For instance, if *kuni* means 'knifefish (*Gymnotus* spp.)', *kuni**on*** means 'electric eel (*Electrophorus electricus*)'. These two types of fish are different from the Kakataibo perspective: they have different physical and mythical properties, and are considered as members of two different generic taxa. The second noteworthy property of *-on ~ -an* 'augmentative' is that it does not always mean that the plant or animal designated by the suffixed term is larger than the one labeled by the non-suffixed noun. This suffix can be used to indicate that an animal is fiercer, more dangerous, more numerous, or has some other salient property. For instance, the name *'inu* 'jaguar; *Pantera onca*' is used to derive the form *'inuan* 'black jaguar; *Pantera onca* (black phase)'. The black phase of the *Pantera onca* is not larger that the regular one, but it is certainly considered fiercer and more dangerous by the Kakataibo people. Notice that the diminutive *-rá* is **never** used for naming plants or animals. This pattern might be suggesting that cognitively the larger species or subtypes are always considered less prototypical.[3] Some examples of the use of *-on ~ -an* 'augmentative' are given in Table 2 (notice that the suffix surfaces as *-an*, when the base ends in *u*).

Table 3: Names of plants and animals with the suffix -on ~ -an 'augmentative

Root	English	Derived	English	Scientific
'isku	russet-backed oropendola	'iskuan	olive oropendola	*Psarocolius bifasciattus*
'utu	russet-backed oropendola	'utuan	peacock moth	*Automeris* sp.
bina	wasp (generic)	binon (<bina-on)	large wasp	unidentified sp(p). in the *Vespidae* Family

[3] A similar distribution is found among Guaycuruan and Mataguayan languages in the Chaco area (see Cúneo 2014, and Messineo and Cúneo 2011).

The suffix *-ina(k)* 'generic' accomplishes an important function in the taxonomic system of Kakataibo: it is used to derive most of the words used for what Berlin et al. (1973) calls **life forms**. Examples of the use of *-ina(k)* 'generic' in this function are: *bakena* (<*baka-ina*) 'animals that live in the rivers' (from *baka* 'river'); ñuina 'animals of medium or big size, usually hunted by the Kakataibo' (from ñu 'thing'); *mena* (<*me-ina*) 'animals that live under ground, making holes (i.e. armadillos)' (from *me* 'ground').[4] The use of the suffix *-ina* 'generic' is restricted to these ethnobiological terms.

Finally, **the suffix *-kuni*** also has an important function in the Kakataibo taxonomic system. As it will be illustrated in section 4.4, ethnobiological polysemy is very common in the organization of the taxonomic system of Kakataibo, and many plant and animal names refer to one particular species (the prototype) and to a superordinate category (the generic taxon to which that prototype belongs). Like in many other taxonomic systems, in Kakataibo the disambiguation of this polysemy "is accomplished by the optional occurrence of a modifier glossed as 'genuine' or 'ideal type'" (Berlin 1992: 34) and the suffix *-kuni* 'genuine' accomplishes that function in the language. Thus, for instance, the word *bo* is polysemous, since it has a generic meaning 'parrots in general' and a specific one, associated with what the Kakataibo people consider as the prototypical species: 'yellow-crowned parrot (*Amazona ochrocephala*)'. The word *bokuni* only has the second meaning. More examples of polysemic names are given in section 4.4. Note that *-kuni* 'genuine' is the only suffix discussed in this sections that exhibits a distribution that goes beyond the ethnobiological domain.

The systematic use of derivational affixes for naming plants and animals has not been taken into consideration in the establishment of the typologies of ethnobiological nomenclature available in the literature (Conklin 1962; Berlin et al. 1973; and Berlin 1992). These typologies have only paid attention to the number of roots a particular name exhibits. Examples like the ones presented in this section are in some way difficult to accommodate in those typologies: they are complex elements which exhibit two morphemes and analyzing them as belonging to the same class as the examples in Table 2 is not straightforward.[5] This is particularly true regarding names with the augmentative *'ëo*. This form seems to have come from the lexical item *'ëwa* 'mother', which is attested in other Panoan languages (cf. Iskonawa, for instance). The form *'ëo* is not anymore a grammatical independent word in Kakataibo and it only appears in complex forms that can be analyzed as [Noun-GENITIVE *'ëo*] (cf. *kaxorin 'ëo* 'passion fruit; lit. mother of the *granadilla*'. In this construction including two (independent) words and a genitive marker, the genitive is getting lost and the form *'ëo* is losing its initial glottal stop and its prosodic independence. Indeed, the augmentative suffix *-on* ~ *-an* seems to be the final stage of a grammaticalization process that started with the lexical form ëwa 'mother'. The existence of examples like this demonstrates that the distinction between names with two roots and names with two morphemes is not always straightforward and that morphological derivation requires special attention in the study of ethnobiological nomenclature.

[4] Interesting, these names do not occur in the San Alejandro dialect, except for ñuina 'animals of medium or big size, usually hunted by the Kakataibo'.

[5] As indicated by one reviewer, it is important to mention that the San Alejandro dialect of Kakataibo, morphophonological evidence suggests that *kuni* is a independent lexical item instead of a suffix.

5.3. Borrowing

A few lexically simple names of plants and animals in our database (22 from a total number of 599) have been taken from the surrounding languages Shipibo-Konibo and Spanish. The names in question are mostly related to species that the Kakataibo people were not familiar with before entering in touch with speakers of those languages. Examples are offered in Table 3.

Table 4: Borrowed Names of plants and animals in Kakataibo[6]

Kakataibo	English	Scientific
‘uchiti (<SK)	dog	*Canis familiaris*
kushuishka (<SK)	dolphin	*Inia geoffrencis, Sotalia fluviatilis*
sapën (<SK)	manatee	*Manatidae*
tëpa (<SK)	toad-headed Turtle	*Podocnemis erythrocephala*
rimun (<Sp)	lemon	*Citrus aurantifolia L. (Christm.) Swingle*
turunka (<Sp)	shaddock	*Citrus × paradisi*
barata (<Sp)	tree sp. (*balata*)	*Manilkara bidentata*

5.4. Ethnobiological polysemy

Cases in which a polysemous term can refer to both a subgeneric taxon and to its superordinate are extremely common in Kakataibo and represent one of the most salient characteristics of its ethnobiological system (see Zariquiey 2014). For instance, the term *kuma* refers to the black tinamou (*Tinamus osgoodi*) but is also systematically used as a generic, meaning simply ‘tinamou (Fam. *Tinamidae*)’. In the latter use, the semantic range of *kuma* includes both *kuma* in its specific sense and many other terms used to name the different species of tinamous identified by the Kakataibo people.

This kind of polysemy has been described for many other languages in the literature (see Berlin et al. 1973, who mention Hanunóo, Karam and Guarani, among other languages). However, what seems to be unusual regarding Kakataibo taxonomy is that this kind of polysemy is the rule for polytypic categories and constitutes a well-established pattern in the system (see again Zariquiey 2014). Examples of this are offered in Table 4. Although all the examples in Table 4 are related to lexically simple terms, a few complex names exhibit similar polysemous patterns.

[6] As also indicated by one reviewer, it is worth nothing that the names for manatee, toronja and dolphin are not attested in the San Alejandro dialect.

Table 5: Polysemous Names of plants and animals in Kakataibo

Kakataibo	English	Scientific
tëtḗ (1)	hawk	Fam. *Accipitridae*
tëtḗ (2)	bicolored hawk	Fam. *Accipitridae*
përu (1)	nightjar	Fam. *Caprimulgidae*
përu (2)	common pauraque	*Nyctidromus albicolis*
bi (1)	mosquito	Fam. *Culicidae*
bi (2)	mosquito	*Culicidus* sp(p).

5.5. Onomatopoeia

Terms of onomatopoetic origin are very common in the Kakataibo ethnobiological lexicon, especially for birds and frogs, as has been found in other languages of the world (e.g., Berlin and O'Neill 1981; Berlin 1992: 232-259). In Kakataibo, onomatopoeia appears in two different constructions: alone, as in the first two examples in Table 5; or as part of a nominalization with the verb *ki-* 'to say (intransitive)', as in the last two examples in same table. Onomatopoeic forms with and without *ki-* 'to say (intransitive)' are almost equally frequent and, therefore, onomatopoeia is a naming strategy involved in the creation of both lexically simple and complex names.

Table 6: Onomatopoeia in animal names in Kakataibo

Kakataibo	English	Scientific
tsuitsu	greater yellowlegs	*Tringa melanoleuca*
umú tumú	capped heron	*Pilherodius pileatus*
rëuxkikë	type of toucan ('one that says rëux')	*Ramphastos vitellinus*
piankikë	violaceous jay ('one that says pian')	*Cyanocorax cyanomelas*

5.6. Compounding

A majority of the names of plant and animals in Kakataibo that include more than one lexeme include a nominal head combined with a modifier. There are no grammatical or prosodic criteria that distinguish between these complex names and productive noun phrases in Kakataibo and therefore I do not find it adequate to analyze the names to be discussed in this section as **lexical** compounds. However, it does not seem appropriate to analyze them as phrases either, since –as any other noun– the complex names to be presented here can be heads of noun phrases and are not on-the-go referential solutions. In this context, I use here the term **compounding** to refer to what Dryer (2007: 175) would call a **syntactic compound**. According to their properties, compounds in Kakataibo can be classified into four main types, as listed in Table 6.

Table 7: Types of compound plant and animal names in Kakataibo

Name	Brief description
Metonymic Noun-Noun compound	$[N_{(MOD)}\ N_{(HEAD)}]_N$ (The modifying noun is the name of an animal, used in a metonymic way to refer to one of its properties, which is applied to the head; e.g. tapir = large).
Non-metonymic Noun-Noun compound	$[N_{(MOD)}\ N_{(HEAD)}]_N$ (The modifying noun is a noun referring to a property of the head noun; e.g. thorn = thorny).
Adjective-Noun compound	$[Adj_{(MOD)}\ N_{(HEAD)}]_N$ or $[N_{(HEAD)}\ Adj(-a)_{(MOD)}]_N$
Genitive-Noun compound	$[N\text{-}GEN_{(MOD)}\ N_{(HEAD)}]_N$

Let us start with **Noun-Noun compounds of the metonymic type**, in which the head is the name of a plant or animal and the modifying noun is the name of an animal used in a metonymic sense: it does not refer to the animal, but to one of its salient properties, which is applied to the referent of head noun as a qualification. In this construction, the head noun is the name of the superordinate. There are two noteworthy properties of Noun-Noun binomials of the metonymic type. The first is that, although what we find in these syntactic compounds is not the usual way to qualify nouns in every-day speech, they are by far one of the most commonly used strategies for coining complex ethnobiological names in the language. Thus, this type of compound is exclusive to the ethnobiological domain. The second interesting pattern has to do with their semantic regularity: the modifying noun is always used with exactly the same metonymic meaning. Table 8 lists all the modifying nouns found in this metonymic use in my database.

Table 8: Metonymic names used in Kakataibo syntactic compounds

Name	Metonymic meaning	Adjective
chuna ‘spider monkey’	‘black; dark-colored’	tunan
kana ‘blue-and-yellow macaw’	‘yellow, yellowish’	panshin
‘o ‘tapir’	‘large’	cha
xón ‘scarlet macaw’	‘red, reddish’	ushin
bo ‘mealy parrot’	‘green, greenish’	paxá

Examples of the use of all the animal names in table 8 functioning as modifiers are offered in Table 9.

Table 9: Examples of metonymic syntactic compounds

Kakataibo	English	Scientific
chuna tëtë	bicolored hawk (‘dark hawk’)	*Accipiter bicolor*
chuna sisi	South American coati (‘dark coati’)	*Nasua nasua* (subtype)
kana ‘ó	tapir subtype (‘yellowish tapir’)	*Tapirus terrestris* (subtype)
kana baxux	butterfly larvae (‘yellowish larvae’)	*Morpho* sp(p).
‘ó ‘ipu	type of armored catfish (‘large armored catfish’)	*Hypostomus* sp(p).
‘ó ‘ëpë	yarina palm (‘large yarina palm’)	*Phytelephas microcarpa R. & P.*
xón chuna kuru	woolly monkey subtype (‘reddish woolly monkey’)	*Lagothrix lagothricha* (subtype)
xón kukan	red-necked woodpecker (‘reddish woodpecker’)	*Campephilus rubricollis*
bo runin	emerald tree boa (‘green boa’)	*Corallus caninus*
bo ‘apashiru	great green iguana (‘green iguana’)	*Iguana iguana*

The use of these modifying names is interesting because there are adjectives (and suffixes, in the case of the augmentative) with similar meanings in Kakataibo. Forms semantically similar to the modifying nouns presented here can be used in *ad hoc* terms: for instance, ***xón*** *chuna kuru* refers to a reddish subtype of woolly monkey that the Kakataibo identify; but ***ushin*** *chuna kuru* (*ushin* ‘red’) can be used to refer to an unexpectedly red woolly monkey, perhaps because it has a red stain, it was painted by a child or it has some sort of illness. The modifying nouns illustrated here cannot be used with this metonymic meaning in any other constructions other than in ethnobiological complex names. A similar strategy for naming animals and plants have been found in Shipibo-Konibo by Valenzuela (1998), but a more detailed comparison of the properties of these compounds in both languages (and other Panoan languages) is still to be done.

Non-metonymic noun-noun syntactic compounds are as common as syntactic compounds of the metonymic type. There are some modifying nouns which are used more or less systematically in this kind of construction. Two examples are *muxa* ‘thorn = thorny’, and *kuru* ‘ashes = ash-colored’. However, many other nouns appear in this type of construction. In some cases, the nouns that we find in these constructions are archaic forms, which cannot be currently translated. Examples of all these situations are listed in Table 9.

Table 10:. Examples of non-metonymic syntactic compounds

Kakataibo	English	Scientific
muxa ro	unidentified thorny tree sp.	unidentified tree
muxa shinin	unidentified thorny tree sp.	unidentified tree
chuna **kuru**	woolly monkey (‘ash-colored spider monkey’)	*Lagothrix lagothricha*
xëpan **kuru**	cockroach (‘ash-colored ?’)	*Blaberus* sp.
chisman **kuru**	giant hunting ant (‘ash-colored ?’)	*Paraponera* sp.

One issue regarding *kuru* 'ashes = ash-colored' is that we cannot be completely sure about its syntactic nature. Although this word is used as a noun and not as an adjective in other constructions (see Zariquiey 2011a: 246-269 for a discussion of word classes in Kakataibo), we find the lexeme *kuru* 'ashes = ash-colored' in some names of plants and animals as post-head modifying (see the three examples with *kuru* in Table 9). This distributional property of *kuru* 'ashes = ash-colored' brings it closer to the class of adjectives, which, in general, can appear before or after the noun they modify. However, when *kuru* is transparently used as an adjective, it carries the modifier *-a* when appearing in the post-head position (accordingly with what has been indicated in Table 6 for adjective-noun syntactic compounds). One interesting fact is that according to one reviewer of this paper, in the San Alejandro dialect the form *-kuru* has grammaticalized into a bound morpheme. The post-nominal cases of this form without the extra *a* in the Lower Aguaytía dialect might be evidence that the same process is currently ongoing in this dialect.

Regarding **adjective-noun compounds**, the only adjective which is systematically found in compounds referring to plants and animals is *uxu* 'white'. Another adjective that may appear in compounds naming plants and animals is *chëxë*, '(dark) red; black'. According to its specific meaning in particular compounds, *chëxë* may be in competition with *xón* 'scarlet macaw = reddish' and *chuna* 'spider monkey = dark', but the form *chëxë* is not common in the corpus. Adjective-noun syntactic compounds are illustrated in the examples in Table 10.

Table 11: Examples adjective-noun syntactic compounds

Kakataibo	English	Scientific
uxu bimpish	white guayaba	*Psidium guayava L.*
uxu chiru	white-fronted capuchin	*Cebus albifrons*
chëxë pua	dark red variety of cush-cush yam	*Dioscorea* sp.
chëxë xai	dark variety of sugar cane	*Saccharum officinarum L.*

Both *uxu* 'white' and *chëxë* '(dark) red; black' require an extra final *a* when appearing after the head. Forms like *pua chëxë**a*** 'dark red yam vine' and *chiru uxu**a*** 'white-fronted capuchin' are possible variants of *chëxe pua* and *uxu chiru*, and, as far as I can tell, forms with the adjective before or after the head are synonymous (but this alternation needs to be studied in more detail).

A final strategy in the creation of compounds is the use of genitive modifiers. **Genitive-noun compounds** are illustrated in Table 11; the first two examples include the genitive form of *'o* 'tapir' and the last two include the genitive form of *chaxu* 'deer':

Table 12: Binomials with a genitive modifier

Kakataibo	English	Scientific
okan chichi	striolated puffbird (‘tapir’s grandmother’)	*Nystalus striolatus*
‘okan ñain	type of tick (‘tapir’s tick’)	Fam. *Ioxodidae*
chaxun bi	type of mosquito (‘deer’s mosquito’)	*Anopheles* sp.
chaxun mais	type of army ant (‘deer’s army ant’)	*Eciton* sp.

Notice that the semantic relation expressed by the genitive modifier may be different from case to case. Thus, while in the first example in Table 11 we find a clearly possessive relation (‘*okan chichi* ‘striolated puffbird (lit. tapir’s grandmother)’); such possessive relation is not equally transparent in the other cases. For instance, ‘*okan ñain* is a type of tick which lives in tapirs, *chaxun bi* is a kind of mosquito that tells where to find deer and *chaxun mais* is a kind of army ant named like this because of its color.

As a final note, it is important to mention that the compounds just illustrated can be modified by other elements producing more complex constructions with more than two constituents. For instance, the Kakataibo people identify three subtypes of woolly monkey and, while the prototypical one is simply called *chuna kunu*, the remaining ones are called *xon chuna kuru* ‘reddish subtype of woolly monkey’ and *kuru chuna kuru* ‘ash-colored subtype of woolly monkey’. Notice that in the latter example, the post-head modifier *kuru* seems to have (partially) lost its meaning and we find the modifier *kuru* twice (this constitutes indirect evidence that that the post-nominal *kuru* is indeed undergoing grammaticalization at least in some constructions).

5.7. Grammatical nominalizations

The process of nominalization can apply to single lexemes or whole clauses. Shibatani (2009) uses the terms **lexical nominalization** and **grammatical nominalization** to refer, respectively, to these two situations. In the case of lexical nominalizations, a verbal or nominal root is derived into a new lexical item, a noun. Note that lexical nominalization is a type of morphological derivation, similar to the cases discussed in section 5.2. Lexical nominalization, however, is not attested in Kakataibo ethnobiological terminology.

In the case of grammatical nominalizations, a clause is derived into a nominal expression, whose internal structure is grammatically more complex than that of a lexeme. Shibatani (2012) calls NMLZs this type of expression. While lexical nominalization is a productive process in Kakataibo, only grammatical nominalizations are found in the ethnobiological taxonomic system of the language. These grammatical nominalizations are all equally participant nominalizations, since they refer to one participant of an event and not to the event itself as a entity-like concept.

Many plant and animal names in Kakataibo are grammatical nominalizations and some may be very complex expressions. Some include pronouns that overtly express the arguments of the nominalized clause. For instance, in Table 12, we find the nominalization [***an*** *nami pikë*] *bina* '[**one** that eats meat] wasp', where the form *an* is a third person pronoun that refers to the subject of the transitive predicate *pi* 'eat' and, therefore, is co-referential with *bina* 'wasp'. Something similar happens in [***anun*** *tuatima*] *ro* '[**one for** not bearing children] medicinal plant', where *anun* is an instrumental third person pronoun co-referential with *ro* 'medicinal plant'. Nominalizations like the ones illustrated so far are followed by a noun like *bina* 'wasp' or *ro* 'medicinal plant', but this noun is not found in all cases (see below). This adjacent noun restricts the interpretation of the nominalizations (see Table 12). One important point about the forms like the ones in Table 12 is that they are highly lexicalized forms and not on-the-go referential solutions. Notice that in those examples we find two different nominalizers: *-kë* 'non-future nominalizer' and *ti* 'future/purpositive nominalizer' (see Zariquiey 2011a: 620-621).

Table 13: Grammatical nominalization in names of plants and animals (I)

Kakataibo	English	Scientific
an nami pi**kë** bina	unidentified wasp type. (lit. 'wasp that eats meat')	sp. of wasp in the Fam. *Vespidae*
anun tua nimi**ti** ro	unidentified tree type (lit. medicinal plant with which one makes infants stand up)	unidentified tree
anun tua**ti**ma ro	unidentified herb type (lit. 'medicinal plant with which one gives birth')	unidentified bush

Ethnobiological nomenclature in Kakataibo exhibits plenty of grammatical nominalizations which lack an adjacent noun. Nominalizations without an adjacent noun are in fact more common than nominalizations that carry it in our database. Crucially, all the onomatopoeic words that carry the verb *ki* 'say (intransitive)' do not show this adjacent noun (see the last two examples in Table 5). However, onomatopoeic words with *ki* 'say' are not the only cases of grammatical nominalizations that do not appear in combination with an adjacent noun equivalent to *bina* 'wasp' or *ro* 'medicinal plant' in Table 12. See Table 13.

Table 14: Grammatical nominalization in names of plants and animals (II)

Kakataibo	English	Scientific
no xëta tënu**kë**	lit. one that sharpened enemy's tooth	unidentified bird
xëta 'amianan**ti**	rufous-tailed flatbill ('one that can harm with his beak')	*Ramphotrigon ruficauda*
taë tëbiska**ti**	lit. one that can cut people's feet	unidentified fish

The use of grammatical nominalizations as lexicalized expression with well-delimited denotations are exclusive to the ethnobiological domain in Kakataibo. Indeed, such cases are typologically very interesting. According to Shibatani (2012), the process of grammatical nominalization does not create proper nouns but a different type of constituent, which is similar to nouns "by virtue of their having an entity-concept denotation; they both denote thing-like concepts, usable in referring to things in the universe of discourse" (Shibatani 2012). However, the denotation properties of grammatical nominalizations are a bit different from what we find in nouns. A grammatical nominalization such as *taë tëbiskati* would be expected to include in its denotation set anything in the world that can cut people's feet. Such a denotation set is too general and, according to Shibatani (2012), without the adequate context it may be communicatively problematic. This is the reason why it is not uncommon to find grammatical nominalizations with an adjacent noun that restricts in some way their interpretation if it is not clear from the context (Cf. the Spanish examples *lo que comí ayer* 'what I ate yesterday' and ***el chocolate*** *que comí ayer* '**the chocolate** that I ate yesterday'). The form *taë tëbiskati*, however, does not function like this. When used as an ethnobiological term and not as a productive grammatical nominalization, the form *taë tëbiskati* does not include in its denotation all the things that can cut one's feet, but all the tokens of one particular species of fish identified by the Kakataibo, exactly like the noun *'uchiti* 'dog' would include all the tokens of dogs as part of its denotation. Thus, regardless of its clause-like internal structure, *taë tëbiskati* exhibit obvious traces of lexicalization. Although we could not identify in Western biological terms the referent of the name *taë tëbiskati*, the Kakataibo people members of our research team were able to give a very precise characterization of this fish.

taë tëbiskati: a type of fish that produces cuts on people's feet when they step on it. It is similar to *raxë xo* [another type of fish], but smaller. Its body is thin and long and its color is clear. It lives in both large rivers and small rivers, but not in lakes. It is edible but difficult to catch.

As *'uchiti* 'dog', the name *taë tëbiskati* can be used to refer to the whole class and to one specific token within it. Thus, for instance, it is possible to say:

(1) *taë tëbiskati ka 'aisama 'ikën*

'*Taë tëbiskati* **fish** are dangerous.' (the whole class)

'The *Taë tëbiskati* **fish** is dangerous' (one token)

Therefore, nominalizations as the ones discussed here are functionally undistinguishable from nouns in terms of its semantic properties and this is why they are argued here to be highly lexicalized. They constitute an intermediate case between lexical and grammatical nominalizations, in the sense that formally they clearly fit the definition of grammatical nominalization, but functionally they operate largely similar to lexical nominalizations. It is important to notice that grammatical nominalizations are extremely common in Kakataibo discourse. However, so far, I have not found lexicalized grammatical nominalizations with the behavior described here outside the semantic domain of plant and animal names. A noun-like denotation seems to constitute an exclusive property of the grammatical nominalizations without an adjacent noun found in ethnobiological taxonomic system of the language.

6. Conclusions

The present contribution has described and illustrated the main naming strategies (i.e. linguistic strategies for coining names) attested in a lexical database of 1233 Kakataibo names of plant and animals. I have described the diverse linguistic processes involved in the creation of ethnobiological names. I have found some correlations between some naming strategies and some name types. Lexically simple ethnobiological names in our Kakataibo database are directly related to five different naming strategies: (1) coining; (2) morphological derivation; (3) borrowing; (4) ethnobiological polysemy; and (5) onomatopoeia, being the case that the latter two are also involved in the creation of lexically complex terms. Finally, two strategies are exclusively related to the creation of lexically complex terms: (6) compounding and (7) grammatical nominalization. Both compounding and grammatical nominalization exhibit constructions that are exclusively found in the ethnobiological inventory of the language and do not constitute general word-formation strategies. This is also true regarding some of the morphological derivations studied here: *-ina* 'generic' and *-o* ~ *-a* 'augmentative' are exclusively found in the creation of ethnobiological names. This constitutes an interesting example of the degree of grammatical specialization that ethnobiological nomenclature may developed. One extra point addressed in this paper has to do with the problems of assuming a binary distinction between lexically simple and lexically complex terms. Some of the cases of morphological derivation found in the Kakataibo ethnobiological inventory are somewhere in the middle.

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