Ketty García-Ruiz, Jaime Huasco-Escalante,
Jhon Jairo López-Rojas

Resemblance metaphor and metonymy in the ethnozoological lexicon of the Amazonian language Aguaruna

Abstract: This chapter focuses on the analysis of resemblance metaphors and metonymies that operate in the ethnozoological lexicon of the Amazonian language Aguaruna. Our corpus is basically composed of binomials (noun-noun compounds) in which these semantic mechanisms are representative and useful for naming sub-generic species. In our analysis, we have mostly identified the mapping of prominent characteristics such as color and shape (metonymic bases) in resemblance metaphors. Many of our examples also reveal the preference for metonymies constituted by habitat data and the diet of the named entities, significant information for a hunting people like the Aguaruna. Finally, we see that, in the binomials analyzed, the source domains are not always other biological organisms (plants and animals), but can be elements of nature, cultural objects, and even mythological characters.

Keywords: ethnobiology, fauna, cognitive linguistics, metaphor, metonymy, Aguaruna, Jivaroan

> What is relevant here is that the semantic resources of language are productively employed in what might be called the metaphorical mapping of the ethnobiological landscape.
>
> —Berlin (1992: 259)

1 Introduction

Metaphors and metonymies are essential in our conceptualization of reality and in the understanding and the expression of our environment (Lakoff and Johnson 1980). Their effects can be seen in everyday language and in specialized areas such as the ethnobiological lexicon. Academic interest in exploring this nomenclature, directly or indirectly, by approaches that consider metaphoric and meto-

Ketty García-Ruiz, Pontificia Universidad Católica del Perú / Universidad Privada del Norte, Peru
Jaime Huasco-Escalante, Pontificia Universidad Católica del Perú, Peru
Jhon Jairo López-Rojas, Instituto Nacional de Innovación Agraria – INIA, Peru

https://doi.org/10.1515/9783110688306-005

nymic mechanisms, can be seen, for example, in the analysis of names of marine biology of Western languages (Ureña and Faber 2010; Ureña 2011; Tercedor, López, Márquez, and Faber 2012; Guasparri 2019). To a lesser extent, studies have also identified such mechanisms in Australian (Turpin 2013) and Amazonian languages (Valenzuela 1998; Zariquiey 2018).

This chapter builds on Berlin's[1] (1992) fifth principle of ethnobiological nomenclature. According to this principle, ethnobiological names usually have metaphorical features that reveal a motivation for relating the name to the named referent. In addition, for Berlin (1992), the names of animals and plants of sub-generic ranks, which usually include linguistically complex forms such as compound nouns (e.g., in English, *white oak*, *black oak*, and *red oak*), reflect this principle in the modifying constituent, where the shape, color, texture, smell, flavor, and other ecological characteristics of particular species are addressed. In this perspective, the aim of this chapter is to analyze metaphors and metonymies that operate in compound nouns (binomials) of the ethnozoological lexicon of the Amazonian language Aguaruna. In our analysis, in addition, we intend to reveal regularities in metaphorical and metonymic mappings as well as particular issues of the Aguaruna ethnozoological nomenclature system.

In theoretical terms, our analysis is framed by cognitive semantics as we consider that this approach allows us to understand, through the lexicon, how the speakers of Amazonian communities conceptualize their natural environment and, particularly, how they structure their deep ethnobiological knowledge, in which cognitive operations and cultural factors relevant to speakers (habits, beliefs, taboos, myths) come into play. Our study also includes an interdisciplinary perspective. This is reflected in our team, which is made up of both linguists and a biologist who works in the area under study. Considering the small number of publications of this nature related to Amazonian languages, we hope to encourage the development of similar studies with this paper.

In section 2, we show the relationship between ethnobiology and cognitive linguistics. We also review the classification of resemblance metaphors of Ureña and Faber (2010) and Ureña (2011). Next, we discuss the classification of metonymies as proposed by Radden and Kövecses (1999), Kövecses ([2002] 2010), and Evans (1997). Likewise, we present the linguistic nature of Aguaruna in broad terms and aspects related to the ethnobiological lexicon. In section 3, we present the methodology for data collection. In section 4, we analyze the metaphors and metonymies of the selected corpus, focusing on the regularities and particularities

1 Berlin (1992) proposes seven general principles of ethnobiological categorization (taxonomy) and five of nomenclature of plants and animals (lexical structure).

that emerge from the Aguaruna ethnozoological nomenclature. Finally, in section 5, we present the conclusion of our paper.

2 Theoretical framework

2.1 Ethnobiology and cognitive linguistics

In the late sixties and during the seventies of the last century, the so-called cognitive anthropologists strengthened fields of study that would become important for linguistics and psychology: perception and categorization. Berlin and Kay (1969), in their widely known work on the perception and categorization of color in traditional communities, proposed a universal approach to color based on basic categories (Boster 2005). Rosch, from a cognitive psychology viewpoint, also studied categorization and established that prototypical colors could be found in the chromatic complexity (Luque 2001).

The color studies showed that perception centered on focused colors, so that these colors were more likely to be named in various languages. Regarding this contribution from Berlin and Kay, Schmid states that "[t]heir research proved to be an important inspiration for cognitive linguists, because it indicated that there was a much closer and more direct tie between perception and naming than had previously been assumed" (Schmid 2007: 122). Certainly, categorization and perception, and their implications for the lexicon, are not only appreciated in the field of color research, but also in folk-biological taxonomies.

Berlin, Breedlove, and Raven (1973), as well as Berlin (1992), suggest precisely that societies basically organize the ethnobiological domain into five hierarchical ranks: (i) *unique beginner*, which considers the most inclusive categories, such as 'plant' and 'animal'; (ii) *life-form*, which includes subdivisions of the *unique beginner*, such as 'tree', 'mammal' or 'bird'; (iii) *generic*, which includes the largest number of biological entities that are derived from *life-forms*, such as 'oak', 'cow', or 'parrot'; (iv) *specific*, which specifies the *generic*, although it is less numerous; and (v) *varietal*, which specifies the previous rank, although its presence is quite small (see Figure 1). Among these, Berlin (1992) argues that the *generic* is the most psychologically prominent rank (therefore, it would be among the first that children learn) and the most numerous of all, since in folk taxonomies it can include around 500 taxa. Thus, the notion of a *generic taxa* in the naming and categorization of animal and plant domains is central. Along these lines, Schmid (2007) considers that the *generic level* is like a strip that divides biological reality and that it is helpful for speakers to name organisms at this level.

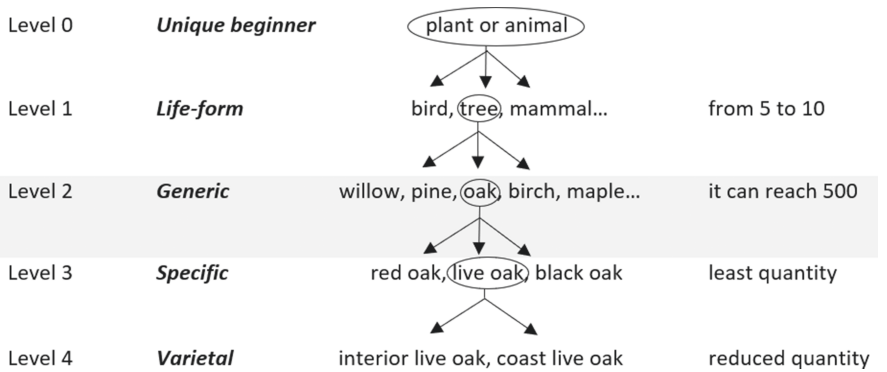

Figure 1: Ethnobiological ranks for the taxonomic organization (based on Berlin, Breedlove, and Raven 1973).

Berlin's notion of *generic level* is related to Rosch's concept of *basic level*. Essentially, *basic level* in taxonomies is an abstraction level that includes elements of easy cognitive recovery (*dog*), since they are quite clear mental images, as opposed to the subordinate (*poodle*) or superordinate (*animal*) items (Cuenca and Hilferty [1999] 2007). In this way, the basic level represents "a fundamental one for the organization of concepts underlying concrete nouns and it is one of the key concepts of cognitive linguistics" (Mihatsch 2016: 461–462).

At the linguistic level, Schmid (2007) points out that the terms at the *basic level* are usually morphologically simple, as at the *generic level* of folk taxonomies. In addition, he states that this level provides "the raw material for extensions of the lexicon by means of metaphor, metonymy, and word formation" (Schmid 2007: 124). In fact, in ethnobiological nomenclature, extensions of the lexicon operate with visibility at the sub-generic levels (*specific* and *varietal*), which is especially identified in compound words. For example, in their study of ethnobiological nomenclature in the Aguaruna language, Berlin and Berlin (1979) showed that both *generic* and *life-form* names are linguistically simple. By contrast, sub-generic level names have generally complex structures, such as binomials $[N\text{-}N]_N$, where the head noun indicates the category that includes the named species and the modifying noun defines the referent, thanks to the metaphorical and metonymic load it has. To that extent, and as we consider it in our work, ethnobiological binomials constitute fertile ground for studies in the field of cognitive semantics. Even though Berlin's proposal has been problematized (Boster 2005; Hunn and Brown 2011), many of the author's concepts remain relevant, such as, for example, the fifth of Berlin's nomenclature principle which specifies the semantic motivation revealed by ethnobiological names. Likewise important is the second principle, which states that "[n]ames for plants and animals com-

monly allude metaphorically to some typical morphological, behavioral, ecological, or qualitative characteristic feature of their referents" (Berlin 1992: 31). In our analysis of ethnozoological binomials, we consider these traits in metaphorical and metonymic transfers.

2.2 Resemblance metaphor and metonymy in the lexical analysis

2.2.1 Resemblance metaphor

The concept of metaphor is central to cognitive linguistics. With the studies presented by Lakoff and Johnson (1980) as well as Lakoff (1987), metaphor is conceived not as a mere poetic operation, but as part of the conceptualization process that human beings carry out. In broad terms, metaphor is seen as "understanding and experiencing one kind of thing in terms of another" (Lakoff and Johnson 1980: 5); that is, we understand a conceptual domain through another domain (Kövecses 2010: 4).

As part of the theoretical development of the conceptual metaphor theory, from the beginning there has been a concern to establish typologies. For example, Lakoff (1987) distinguishes *image metaphors* from *structural metaphors*, and Grady (1999) differentiates *resemblance metaphors* from *correlational metaphors*. According to Ureña and Faber (2010), to a greater or lesser extent, these classifications make a distinction between metaphors based on comparisons of physical or behavioral features (for example, *the computer mouse* or *Achilles is a lion*[2]) and metaphors based on more abstract and subjective correlations (such as LOVE IS A JOURNEY or A DISCUSSION IS WAR).

If we focus on the study of names of animal and plant organisms, several investigations have revealed the constant participation of metaphors based on physical or behavioral analogies (Guasparri 2007; Juliá 2009; Ureña 2011; Turpin 2013; Zariquiey 2018). Along these lines, it is pertinent to present the proposal by Ureña and Faber (2010) of *resemblance metaphors*, because it precisely includes these analogies. Basically, *resemblance metaphors* consider physical (shape, color, dimension) or behavioral (behavior, performance) characteristics as the basis of

2 The technological device is called a mouse because there is an analogy between the device and the physical appearance and movements of the rodent (Ungerer and Schmid [1996] 2006: 148). On the other hand, in *Achilles is a lion*, the brave behaviors of both Achilles and the lion are associated with how they face an opponent, and not with a comparison of the physical aspect (Grady 1997).

metaphorical projections from one domain to another. In this way, Ureña and Faber (2010) include in their proposal of *resemblance metaphor,* Lakoff's (1987) *image metaphor,* and Grady's (1999) *resemblance metaphor*. The criteria for both being part of a single category is due to the fact that mental images underlie both.

Although mental images are generally considered to be associated with the visual perception of physical attributes (such as color and shape), Ureña and Faber (2010) argue that it is possible that events or actions also evoke mental images (in this case, dynamic images). This means that mental images are formed not only through visual perception, but also through other channels of perception. Coinciding with this, for Ureña and Faber (2010), Lakoff's *image metaphor* and Grady's *resemblance metaphor* would be related to static mental images and to dynamic images, respectively.

Following the mental images criteria and the examples presented by Ureña and Faber (2010) in their study of marine biology, the following classification of *resemblance metaphors* is established: (i) *image metaphors*, based on static images, which prototypically consider color and shape traits; (ii) *behavioral based-metaphors*, which may have dynamic images or static images; and (iii) *metaphors with physical and behavioral motivations*, which constitute a transition between the first two (see Figure 2).

In the field of marine biology studied by Ureña (2011), there are prototypical examples for each group. A clear example of the first group, *image metaphor*, is *seahorse* (*Hippocampus*); named as such because the shape of the horse's head is projected towards the top of the named marine species. This is a metaphor based on visual perception (static image). According to Ureña (2011), these metaphors maintain a high level of iconicity between the source domain and the target domain. Likewise, these metaphors (which consider color and form) are seen as prototypical (Ureña and Faber 2010). Correspondingly, for our analysis, we chose to name as *non-prototypical image metaphors* those that take into account other features (texture, pattern, flavor, smell, sound). For the second group, *archer fish* (*Toxotidae*) is an example of a *behavior based-metaphor with dynamic image*, since it is not based on a correspondence of form or color (static image), but on the dynamic behavior performed by both the *archer* and the *fish*. In this case, actions are mapped: the archer throws an arrow towards a target as the fish throws drops of water at an insect close to the surface of the sea. Within this second group, Ureña and Faber (2010) state that it is possible to find *behavior based-metaphors with static image* such as in *hawk fish* (*Cirrhitidae*), in which the waiting position of the fish on the reefs is compared with the position of the hawk looking out for potential prey. As for the third group, they indicate that it is possible to find *metaphors with physical and behavioral motivations* such as in *boxer crab* (*Lybia tessellata*), where

there is a similarity between the tweezers and the arms of the boxer as well as in the defense actions that both entities perform with their limbs.

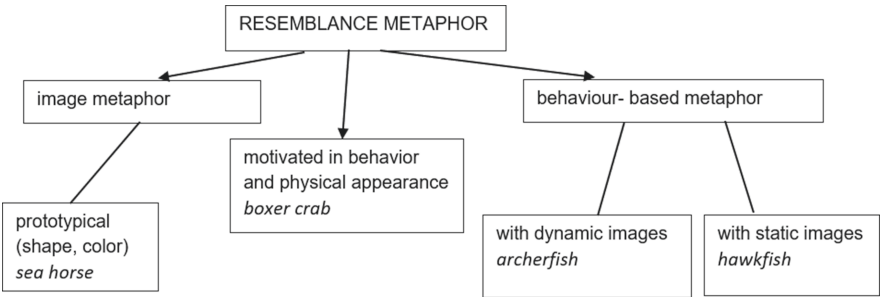

Figure 2: Classification of the resemblance metaphor based on Ureña and Faber (2010).

2.2.2 Metonymy

The revised *resemblance metaphors* do not operate in isolation, but are presented together with metonymies. As Kövecses (2013) suggests, in image metaphors it is a constant that there is a metonymic basis, given that a part of the entire entity is mapped to make the conceptual correlation with a part of another entity. This occurs when "the inevitably partial structure of the source, B, is used to conceptualize an equally inevitable part of the target, A, resulting in the metonymies 'A PART OF B FOR THE WHOLE OF B and A PART OF A FOR THE WHOLE OF A', given the general metaphor format A IS B" (Kövecses 2013: 75). Following this observation, several ethnozoological names involve metaphoric mechanisms that originate from metonyms or partial identifications of a whole.

Therefore, the definition and taxonomy of conceptual metonymy proposed by Radden and Kövecses (1999) and Kövecses (2010) is useful for our analysis due to their organization of a wide variety of metonymic relationships based on *idealized cognitive models* (ICMs). Precisely so, the definition of Radden and Kövecses (1999) of metonymy as "a cognitive process in which one conceptual entity, the vehicle, provides mental access to another conceptual entity, the target, within the same idealized cognitive model [ICM]" (Radden and Kövecses 1999: 21) helps to understand the ICMs as organizing domains of the world, since, as speakers, we understand 'reality' as parts of a whole (in a metonymic way).

Radden and Kövecses (1999) begin their organization of the various types of metonymies with two broad relational categories, *whole-part* and *part-part*. According to Littlemore (2015), Radden and Kövecses's proposal includes 6 ICMs

within the *whole-part* category, and with them derives up to 21 types of metonymies (PART FOR WHOLE, ENDS FOR WHOLE SCALE, MATERIAL FOR OBJECT, etc.). Regarding the *part-part* relationship, the proposal includes 10 ICMs that allow them to activate up to 43 metonymies (THING PERCEIVED FOR PERCEPTION, EFFECT FOR CAUSE, PRODUCER FOR PRODUCT, etc.). Particularly, in our ethnozoological corpus, in addition to the names that contain metonymies that interact with *resemblance metaphors*, there is a considerable group of binomials in which metonymy operates independently in the modifier (Benczes 2006).

As a complement to the classification of Radden and Kövecses (1999), we consider the *sign metonymy* developed by Evans (1997). This metonymy is activated when "one biological entity signals the presence or availability of another" (Evans 1997: 136). We must consider that these metonymies are not limited to relating biological entities, but also include cultural elements (taboos and myths). Turpin (2013) presents examples of the Australian language Kaytetye in which she describes the presence of hazards through the songs of various species of birds. In addition to cultural factors, sign metonymies include associations of biological entities with meteorological occurrences. This is of special interest for our analysis because, in the Aguaruna lexicon, there are cases in which the presence of an ethnozoological species indicates the arrival of summer or the abundance of rainfall.

2.3 The Aguaruna language, its speakers, and its ethnobiological lexicon

Aguaruna is an Amazonian language spoken in the Peruvian regions of the Amazon, Cajamarca, Ucayali, Madre de Dios, and San Martín. Together with the Shuar, Wampis, Shiwiar, and Achuar, the Aguaruna is part of the Jivaroan languages spoken in Peru. According to the national census of 2017, in regions mentioned above there are 419 communities that house approximately 52,573 people who have Aguaruna as their first language (INEI 2018).

Historically, and after several migratory movements, many Aguaruna communities have occupied the upper basin of the Mayo River, known as the Alto Mayo region, located in the provinces of Rioja and Moyobamba, in the region of San Martín (Elliot 1998). According to Barreto (2009), these communities were strategically located near the Mayo River and its tributaries in order to take advantage of natural resources. Currently, there are 14 Aguaruna communities in this area (see Figure 3).

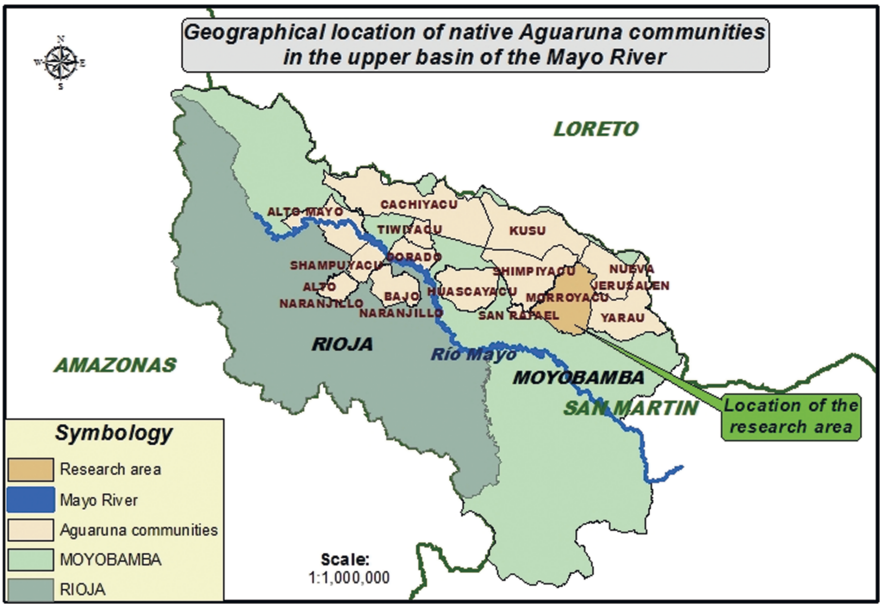

Figure 3: Location of the Morroyacu community. Source: Elaborated by the Environmental Engineer Raúl Reátegui-Ruiz.

The data we use in this chapter were collected and elicited in the community of Morroyacu (Moyobamba) in the months of January, July, and December 2019. This is a hamlet that has just over 30 homes, a kindergarten, and a primary school (both are bilingual). The population has a strong rooting towards their native language, as people of all ages speak it and, until now, children acquire Aguaruna as their first language. As for their daily activities, families cultivate agriculture, hunt, and fish for food. Morroyacu has a warm and moderately rainy climate with a temperature that varies from 16.4 to 28.4°C, which are appropriate environmental conditions for maintaining a varied flora and fauna.

Aguaruna is an agglutinative language of the nominative-accusative type with dominant SOV syntactic order (Corbera 1994). In relation to the class of words, it has open categories such as verbs, nouns, and adjectives, which are complemented by minor words, such as pronouns, determiners, adverbs, and interjections (Overall 2007). Phonologically, this language is characterized by its nasality, and at the morphosyntactic level, it presents case markers that are added to nominal categories.

In our study, we will analyze ethnobiological names. In Aguaruna, we can find names of animal and plant entities with the following profile: (i) simple nouns, which make up the majority and especially name generic levels of ethnobi-

ological taxonomy, such as *punúk* 'crab' (*Cambaridae* spp.[3]); (ii) derivative nouns, which can be located at the sub-generic level, such as *jempé-kit* 'hummingbird with yellow beak' (*Trogonidae* spp.); (iii) noun-noun compounds, which have an important presence in the lexicon and which essentially cover sub-generic categories, such as *shuin katíp* 'type of rat' (*Akodon* sp.); and (iv) constructions with genitive, which are rare and also cover sub-generic categories, such as *iwanchí tugkuíji* 'type of stick insect' (*Phasmatidae* spp.). In this study, we focus only on the last two cases.

3 Data and methodology

Following the methodological proposal of Fleck (2007), this work is the result of an interdisciplinary effort between biology and linguistics. To that extent, the work team is composed of linguistic specialists and a biologist who works in the San Martín region. It is also important to recognize the active participation of members of the Morroyacu community in the interviews we conducted.

Within the framework of the ethnographic nature of our study, we can point out the following work sequence. First, we prepared a database of 151 entries with the help of Aguaruna-Spanish dictionaries (Minedu 1996; Aidesep 2011), technical documents on food (Creed-Kanashiro, Roche, Tuesta and Kuhnlein 2009), fauna (Dauphiné 2008; Patton, Berlin, and Berlin 1981), reports of fieldwork in Aguaruna communities (Brown 2014, Berlin and Berlin 1979), and texts of Aguaruna mythology (Chumap and García-Rendueles 1979). In other words, we elaborated what Fleck (2007) calls an "expected species checklist". Next, we made three trips to the Morroyacu community in the months of January, July, and December 2019. In each visit, we developed two group sessions and one personal interview with each collaborator. We usually worked with five adults (the men dedicated to hunting and the women to the care of the orchards) and one elderly male (a connoisseur of myths). In data elicitation, as proposed by Fleck (2007), we sought to compile ethnobiological names in the vernacular and to match these names to those in the initial list. Finally, we processed all the information and consolidated the final database of 92 entries.[4]

3 Throughout this paper, when we do not fully identify the species, we use the abbreviation sp. (singular form of species), and,- if it refers to multiple species of the same genus – spp. (plural form) after the generic name.

4 The final corpus can be seen at https://docs.google.com/spreadsheets/d/16fKicrnoHFkBOFC-Q1ZJAhKZiPX_cZQxCD9URzIuz6zg/edit?usp=sharing

In the formation of our database, we considered the noun-noun compounds that have the scheme $[N_{(MOD)}\ N_{(HEAD)}]_N$. We have chosen these binomials because their semantic motivation still maintains some transparency. In these binomials, the modifying name presents the metaphorical or metonymic load, while the head noun identifies the category that includes the referent named by the entire compound (in Aguaruna, this category usually refers, in taxonomic terms, to a *generic* rank or *life-form* rank). It should be noted that in our final database we have included two specific cases. Their specific nature lies in their complex structure (constructions with genitive) while their elements do not reveal the identity of the designated referent.

4 Resemblance metaphor and metonymy in the ethnozoological lexicon of the Aguaruna

In this section, following the classification of resemblance metaphors and the taxonomy of metonymies described above, we organize our analysis into three groups: (i) resemblance metaphors (*prototypic and non-prototypic image metaphor*, *behavior-based metaphor,* and *metaphor with physical and behavioral motivations*), (ii) independent metonymies, and (iii) specific cases.

4.1 Resemblance metaphors

In our corpus of 90 ethnozoological binomials, 72 present resemblance metaphors, which amounts to 80% of the total. Regarding the classification of resemblance metaphors (Ureña and Faber 2010), we note that there is primacy of the *image metaphor* with 67 cases; while there are only four *behavior-based metaphors* (with dynamic image) and one *metaphor with physical and behavioral motivations* (see Table 1).

Table 1: Distribution of resemblance metaphors in the analyzed corpus.

72 cases of resemblance metaphor				
image metaphor		with physical and behavioral motivations	behavior-based metaphor	
color, form (prototypical)	texture, pattern, flavor, sound (nonprototypical)		with dynamic images	with static images
52	15	1	4	0
93 %		1.4 %	5.6 %	0

Of the 67 binomials that present *image metaphors*, most are prototypical (52), that is, metaphorical mappings are based on the similarity of color or shape. There are also cases that we have called non-prototypical (15), which associate other features (dimension, texture, pattern, and even flavor). However, in many cases, it is natural that color is linked to shape, pattern, or texture. With regard to domains, in Aguaruna, the entities that serve as source domains are mostly animal and plant organisms, although there is a preference for naming animals in terms of other animals. To a lesser extent, we find comparisons with cultural objects (such as vessels and ornaments) and natural products (such as salt and stones).

4.1.1 Prototypical image metaphors

Initially, we focus on color. In (1) and (2), the preference of speakers to name two types of tarantula accurately makes them turn to widely known species of monkeys to perform metaphorical transfer. Of the species that serve as source domain, *yakúm* (*Alouatta seniculus*) and *wáshi* (*Ateles belzebuth*) speakers select the reddish and black colors, respectively, to identify tarantulas that have similar colors. In these metaphors, in addition, the identification of the hairs is important because these tarantulas are profusely hairy which bears resemblance to monkeys. Undoubtedly, speakers take advantage of the profound knowledge they have of monkeys in the designation of arachnids. These mammals are part of the Aguaruna diet and even their skin and teeth are used to make products (Creed-Kanashiro, Roche, Tuesta, and Kuhnlein 2009). On the other hand, the highlight of these binomials is that the modifying nouns identify species of monkeys and not a generic taxon or another grouped form. Then, the image metaphor operates in the binomial and manages to particularize the entity named by the head noun, that is, it allows the naming of sub-generic organisms (tarantula types):

(1) *yakúm tséje* ‘reddish spider’ (*Theraphosidae* spp.)
reddish howler monkey – spider

(2) *wáshi tséje* ‘black spider, big and hairy’ (*Theraphosidae* spp.)
black spider monkey – spider

As we have seen in the first cases, the colors of a known species are selected to overlap with another species. The same mechanism is observed in (3) and (4), in which the red color of the *jápa* ‘deer’ (*Mazama americana*) clearly defines the chromatic characteristics of two types of ants, *yutúi* and *tíship*. Our collabora-

tors affirm that *jápa* is a red deer that stands out culturally because it appears in several Aguaruna myths. In these binomials, once more, image metaphors based on color underlie names that identify organisms of the sub-generic level:

(3) *jápa yutúi* 'reddish ant of painful sting' (*Paraponera clavata*)
red deer – ant

(4) *jápa tíship* 'reddish ant' (*Odontomachus bauri*)
red deer – ant

In the examples presented, image metaphors have a metonymic basis. Following Kövecses (2013), we assume that a part of a source entity (color, shape, pattern, texture, etc.) is selected by the entire entity to map it onto a similar part selected from another target entity. Thus, in (1), (2), (3), and (4), the PART OF A THING FOR THE WHOLE THING metonymy is activated, in which the color is the prominent part. With respect to the metonymic basis of color, Biggam (2012) has presented examples in which a fruit, for example *strawberry*, is identified by its chromatic characteristics, the color red, as seen in the names of horses in English, as it is the case of the 'strawberry roan' horse.

Plants are also considered in the lexical construction of ethnozoological names. The cases in which the *ipák* 'annatto' (*Bixa orellana*) and *súa* 'genip' (*Genipa american*) appear are especially relevant and regular, since both have great cultural importance for speakers. The seeds of the *ipák* vary from red to orange depending on the variety and the degree of maturity. That range of colors is the basis for identifying intensely red species such as an ant species in (5), a type of snake in (6), and a wasp in (7). In Figure 4, we show two cases:

(5) *ipák kámpa* 'red ant' (*Solenopsis invicta*)
annatto – ant

(6) *ipák dápi* 'medium red snake' (*Colubridae* sp.)
annatto – snake

(7) *ipák éte* 'red wasp' (*Vespidae* spp.)
annatto – wasp

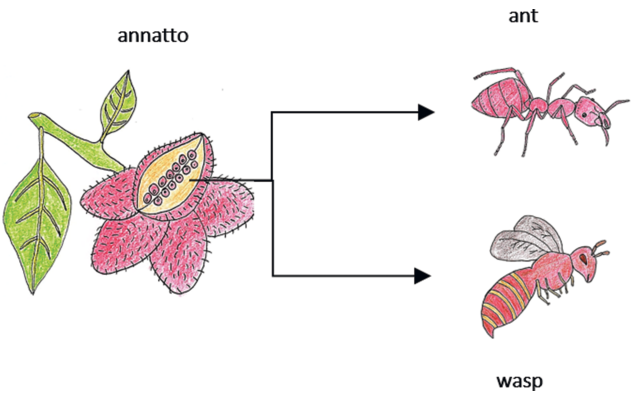

Figure 4: Metaphorical mapping of *ipák* 'annatto' onto two insects: a red ant and a red wasp. Drawing by Jaime Huasco.

On the other hand, the faint orange color of the *ipák* is also used to identify a species of hummingbird in (8) and a medium sized bird in (9). It should be noted that these types of birds have an orange color that is far from their most prototypical specimens; the prototypical hummingbird is green and blue and the latter is brown, hence the need to differentiate them lexically:

(8) *ipák jémpe* 'orange hummingbird' (*Trochilidae* spp.)
annatto – hummingbird

(9) *ipák chígki* 'orange baking bird' (*Furnarius leucopus*)
annatto – bird

It should be remembered that *ipák* is a plant that grows without difficulty and is used in several activities of notorious cultural importance in the community, such as painting ceramics, dyeing textiles, and painting the body in ceremonial activities. In addition, in Aguaruna mythology, *ipák* and her sister *súa* were originally women who, because of the loss of the husband they shared, decided to become plants that give people color. *Ipák* would provide warm colors, while *súa* would supply dark colors.

The seeds of *súa* (*Genipa americana*) are used to make natural hair dyes, to keep it silky and to cover gray hairs. As with her sister *ipák*, *súa* is a source of a color (deep dark) that stands out metonymically to establish similarity with black animal species. For example, a black owl in (10), a variety of dark ant in (11), and snakes covered in dark skin in (12) and (13). In fact, in the myths of Aguaruna, the animals that hugged *ipák* and *súa* had their skin dyed and changed their appearance forever. In Figure 5, we show two cases:

(10) *súa ampúsh* ‘black owl’ (*Strigiformes* spp.)
genip – owl

(11) *súa kámpa* ‘black ant’ (*Solenopsis invicta*)
genip – ant

(12) *súa dápi* ‘black and aggressive snake’ (*Colubridae* sp.)
genip – snake

(13) *súa págki* ‘black anaconda’ (*Eunectes murinus*)
genip – anaconda

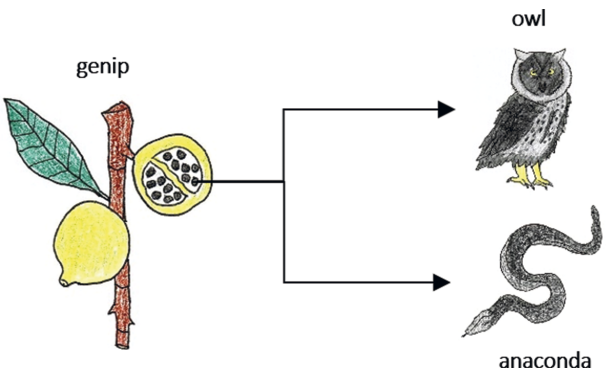

Figure 5: Metaphorical mapping of *súa* ‘genip’ onto two animals: a black owl and a black anaconda. Drawing by Jaime Huasco.

In addition to the examples presented, there is a significant number of cases in which a high variety of colors is considered salient elements that are metaphorically projected to entities of the animal world. Speakers take advantage of the intense green of the parrots, the white of the cotton, the luminosity of the firefly, the multicolor of the toucan and even the gray of the stones. That is, they use a wide color palette as a reflection of their thorough perception of the colors and tones that their surroundings offer.

After color, shape is highly regarded as the basis of image metaphors. In (14), the shape of a prototypical leaf is selected (in Aguaruna, there are approximately 17 words to name 17 varieties of leaves respectively) to establish the similarity with the wings of a lobster type. The resemblance is obvious, especially if we take into account the green color of the leaf and the type of lobster named. That is, there is a high iconic correspondence.

(14) *dúka mánchi* ‘lobster with leaf-like wings’ (*Scudderia* sp.)
leaf – lobster

In (15), the long, sinuous, and green stems of the climbing plants have metaphorical correspondence with long and green snakes, since they are similar. In (16), the elongated tubular shape and the dark brown color of the loose branches that rest on the banks of the rivers, and that are usually in a state of decomposition, are highlighted to map onto the shape and color of another type of snake. It should be noted that the named snakes hide precisely in places where the stems and branches described abound. Consequently, these metaphors also provide essential information for the conservation of life:

(15) *káap dápi* ‘snake similar to vine’ (*Philodryas argentea*)
vine – snake

(16) *wíchi – págki* ‘rotten trunk-like anaconda’ (*Eunectes murinus*)
rotten trunk – anaconda

Another group of names that represent interest for speakers are those that identify wasps.[5] In these cases, the recurring pattern is the designation of these insects based on the identification of their nests. In (17), the nest of a wasp species is identified by its similarity with the muzzle of the *kushi* ‘coatis’. A similar mechanism is observed in (18), in which the comparison is projected from the ovoid shape of the human head to the oval shape of the nest of another type of wasp:

(17) *kúshi éte* ‘type of wasp’ (*Vespidae* spp.)
coatis – wasp

(18) *buúk éte* ‘type of wasp’ (*Vespidae* spp.)
head – wasp

We consider that, in (17) and (18), the nest is a metonymic vehicle used as access to the type of the designated wasp. It is possible that the nest has been selected as a metonymic vehicle because it is an element of easy perception, due to its volume and outstanding shape. In addition, we can highlight the pragmatic value

5 The wasps listed in this section were recognized in fieldwork as part of the family *Vespidae*. We maintain this label in the cases presented because we are still uncertain of the wasp’s identification at the species level.

of appointing wasps by their nest, since in entomology it is affirmed that nests are peculiar for each species (García 1978). Basically, we understand the nest as a form of habitat, which is why we propose that the metonymy that serves as basis for metaphorical comparison would be HABITAT FOR INHABITANT. The same scheme is identified in (19), where the nest is compared with a clay vessel of an ovoid shape. In (20), the similarity is established with a basket made of dry braided leaves (in this case, the shape interacts with the pattern). Finally, in (21), the similarity of the nest with a container made of pumpkin is highlighted. In Figure 6, we show three cases:

(19) *piníg éte* 'type of wasp' (*Vespidae* spp.)
clay vessel – wasp

(20) *piták éte* 'type of wasp' (*Vespidae* spp.)
hanging basket – wasp

(21) *tsápa éte* 'type of wasp' (*Vespidae* spp.)
pumpkin bowl – wasp

In our initial database, there are up to 14 compound names for wasps. Although many of these names have lost semantic transparency, it is logical to assume that some follow the nest identification pattern. Regarding these names, it is possible to think that this pattern could be recurrent in other Amazonian languages. For example, Valenzuela (1998) has presented the shipibo name of *oxe bina* 'moon wasp' for a wasp whose nest is shaped like a moon.

4.1.2 Non-prototypical image metaphors

Another interesting group that we call non-prototypical image metaphors is related to the texture, pattern, dimension, and even flavor of the named species. According to Ureña (2011), the concepts respond to our interaction with the environment, within a process in which all our senses intervene: "[t]his means that [the concept] emerges because we receive information from different sensory-perceptual inputs" (Ureña 2011: 38). In the metaphors that we exemplify in this section, we evidence that the perception expands: in addition to the visual perception, flavor, and touch are considered.

In (22), the rough and bristly texture of the *nája* 'nettle' leaf resembles the lateral and spiny part of the body of the *pútu* 'armored catfish'. In fact, what has been compared is the sensation we experience with our hands when we manip-

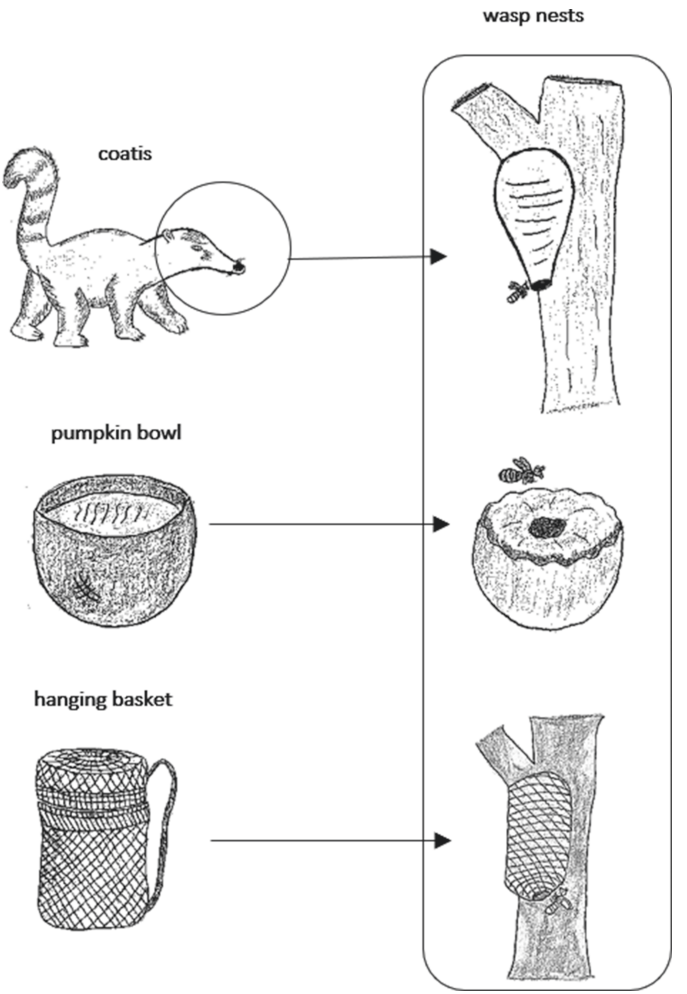

Figure 6: Metaphors based on the shape of the wasp's nest. Drawing by Jaime Huasco.

ulate both entities. On a perceptual level, nettle is a highly visible wild plant because it grows profusely in the surroundings of the community; in addition, it has medicinal relevance. Consequently, the use of this plant as part of the binomial allows the immediate identification of the variety of armored catfish that is named:

(22) *nája pútu* 'nettle-like armored catfish' (*Loricariidae* spp.)
nettle – armored catfish

With regard to pattern, visual perception focuses more on the details of the skin of mammals or snakes and the wings of insects. In (23), speakers mentioned that the skin of a type of sloth has scattered spots on the body, such as the spotted skin of the jaguar. In this case, the perception of the similarity of patterns in the skin of mammals serves to perform metaphorical transfer. In (24), speakers name a butterfly *ántach wámpishuk*, comparing its wings with the wings of an exemplary dragonfly. These wings are like transparent plastic sheets that have scattered lines on the surface. Even when the wings differ in shape, the speakers clearly recognize the similarity of the pattern; for this reason, the image metaphor in this binomial operates successfully:

(23) *yawá uyúsh* 'sloths with skin spots' (*Bradypus variegatus*)
jaguar – sloth

(24) *ántach wámpishuk* 'butterfly with transparent wings' (*Nymphalidae* spp.)
dragonfly – butterfly

A particular case is presented in (25) and (26). They are binomials that include the noun *wée* 'salt' to name and identify the salty taste of the categories they modify: in (25), a type of river snail and, in (26), a type of coatis, both with a peculiar salty taste. Regarding the participation of metonymy, we believe that the DEFINING PROPERTY FOR THE CATEGORY metonymy operates, since it evokes the characteristic flavor of the salt blocks, instead of shape or color. Then, it is the property of flavor that the speaker experiences when consuming salt that is projected metaphorically onto the domain of the designated species.

(25) *wée tsúntsu* 'big river snail' (*Pomacea* sp.)
salt – snail

(26) *wée kúshi* 'type of coatis' (*Nasua nasua*)
salt – coatis

As a corollary of the analysis of the prototypical image metaphors (color and shape traits) and the non-prototypical ones (texture, pattern, flavor), in general, we observe that, at the taxonomic level, binomials allow subcategorizing mostly *generic categories* and, to a lesser extent, *life-forms*. To sub-categorize, the head noun indicates the category (*generic* or *life-form*), while, through the modifying noun, a prominent part of a highly perceptible entity (usually plants or animals of the generic level) is selected to establish the metaphorical mapping. This met-

aphorical mechanism, then, functionally underlies the naming of entities that generally occupy *specific* and *varietal* levels.

4.1.3 Behavior-based metaphors (with dynamic image)

In our corpus, there are 4 binomial names of behavior based-metaphors. All these are based on dynamic images (in our data, we have not found behavior based-metaphors that have static images). The species named with these binomials are varied and the source domains involved include ethnozoological entities and a mythological being.

The metaphorical connection in (27) implies a detailed knowledge of the activity performed by peccaries (source) and a type of ant (target). The movement of peccary herds and their grouping around a leader is mapped onto the compact movement of advancing groups of ants led by a leader. Both entities have the objective of searching for food and defending against an opponent. Consequently, speakers understand the peccary and the ant based on their most visible activity, which is metonymically highlighted for use in the constitution of the metaphor:

(27) *páki katsáip* 'type of army ant' (*Eciton* sp.)
peccary – army ant

In (28), basically, the action of damage is metonymically highlighted both in an ant and in a type of armored catfish. Speakers have experienced the accurate attack of both and that is why the action of biting (of the ant – source) in the presence of a stranger is transferred to the action of stinging (of the armored catfish – target) in a risk situation:

(28) *yutúi kumpáu* 'type of armored catfish' (*Pimelodidae* spp.)
ant – armored catfish

Finally, in (29), the negative and sinister activity of *íwanch*, a diabolical being in Aguaruna mythology, serves to establish the metaphor with the perverse behavior of a species of deer. In the community of Morroyacu, several speakers represent *íwanch* as a hairy being who harasses people on roads. This description coincides with the stories collected by Brown (2014) in other communities of Alto Mayo. With regard to metaphor, this is activated because the deer (target domain) is described as an inedible animal, negatively connoted since it represents a danger to people, just like the *íwanch* (source domain). Some speakers even stated that the deer had the ability to hypnotize them to carry out its attack. Definitely, in this

metaphor, there are restrictive cultural factors that delimit the conceptualization of the named referent. A similar situation is observed in (30), where aggressive behavior is again mapped:

(29) *íwanch jápa* 'deer that attacks man' (*Cervidae* sp.)
devil – deer

(30) *íwanch éte* 'wasp that attacks man' (*Vespidae* spp.)
devil – wasp

As we have seen, the recovery of deeper ecological and cultural knowledge is essential to clarify the semantic motivation involved in behavior-based metaphors (with dynamic images). In addition, although there are only four cases, the data shows that the entity that constitutes the source domain is not limited to the biological world, but also considers elements of the supernatural world, always as part of the process of sub-categorization of ethnozoological entities.

4.1.4 Metaphors with physical and behavioral motivations

In this section, behavioral traits and some "physical" similarity are shown to coexist. In (31), the dynamic image of an arrow traveling through the air at full speed (functional pattern of an object) is superimposed on the image of the hummingbird in rapid flight. In this case, although there is movement of the arrow and the bird, it is possible to think that the point of comparison is the line drawn by the two entities. That is, the speaker would compare an imaginary line produced by the movement. It is also likely that physical similarity is established between the arrow and the elongated peak of this type of hummingbird. In our corpus, there is only one case of this type of metaphor.

(31) *tséntsak jémpe* 'fast hummingbird' (*Trochilidae* spp.)
arrow – hummingbird

4.2 Independent metonymies

In line with what has been suggested by Kövecses (2013), we have seen that in resemblance metaphors, metonymy plays an essential role. In this section, the relevance of metonymy is maintained, however, it does not operate together with the metaphor, but independently through a modifying noun. As Benczes (2006)

argues, the modifying element allows access to the target element within the same ICM; in addition, "the meaning of the compound is a combination of the second constituent, which also acts as the profile determinant, and the metonymical understanding of the first constituent" (Benczes 2006: 142). In our corpus, we have identified 18 such cases. It is interesting to see that almost all cases (16) refer to the knowledge of the habitat or of the diet of the named species.

In (32) and (33), as part of the Containment ICM, the HABITAT FOR INHABITANT metonymy is activated to identify some species. Kövecses (2010) has already argued that it is common to conceptualize places as containers for people. In Aguaruna, this metonymy not only implies a location, but also provides information for hunting, such as recognizing danger or building knowledge of a complex environment such as the Amazon forest. In (32), the meaning is related to location by identifying the space that a type of termite inhabits. In (33), a detailed location is evoked (a certain leaf) with the intention of staying protected from a dangerous insect, a type of wasp:

(32) *núgka kábau* 'type of termite' (*Isoptera* spp.)
soil – termite

(33) *dúka éte* 'type of wasp' (*Vespidae* spp.)
leaf – wasp

For the following cases, considering the example of metonymy FOOD FOR CUSTOMER by Lakoff (1980), 'the ham sandwich is waiting for his check', we propose the metonymy FOOD FOR CONSUMER for cases in which the species is named by the food that it consumes, as in (34), (35), and (36).[6] Kövecses (2010: 184), with respect to Lakoff's example, states that the conceptual relationship between the food and the customer is undetermined. However, he adds that the relationship is 'clearly determined' within the restaurant. In the examples we present, the food-consumer relationship is determined because speakers are familiar with the diet of animals that surround them. Logically, their status as hunters has led them to consolidate this knowledge.

In this way, in (34), the fishing activity of Aguarunas has allowed them to identify a type of armored catfish through their peculiar consumption of rotten wood accumulated in superficial parts of the rivers. In (35), the information on the

6 These cases show a type of metonymy with some regularity in Aguaruna. However, as Bernárdez (2005, 2016) points out, it is convenient to continue investigating to determine if cases such as 'the ham sandwich is waiting for his check' or other similar ones are only isolated metonymic references or long-range metonymies which can lead to generalization.

fruit of a palm tree consumed by a type of peccary serves to increase the chances of the Aguaruna people of hunting it. Finally, in (36), they manage to identify a group of edible birds through what these consume: a leafy green fluff that covers the trunk of some trees. In the latter case, it should be noted that the head noun *shigki* (bird in general, of considerable size and hunted for consumption) is not a *generic* taxa, but of a *life-form* taxa (Berlin and Berlin 1979). Despite this and according to our collaborators, the binomial *juú chígki* can accurately identify a particular bird (medium size, and gray and brown plumage).

(34) *wíchi tsuútsun* 'type of fish' (unidentified)
rotten wood – fish

(35) *tuntúam páki* 'type of peccary' (*Pecari tajacu*)
palm fruit – peccary

(36) *juú chígki* 'medium gray and brown bird' (unidentified)
green bush trunk hair – bird

In Aguaruna, we can also find the so-called sign metonymies (Evans 1997: 136; Turpin 2013). In our corpus, there are cases in which biological entities are associated with weather changes and the presence of other species. For example, in (37), the presence of *páki* 'a type of peccary' is interpreted by speakers as an accurate sign of the arrival of summer, hence the binomial presents the noun modifier *esát* 'summer'. In (38), the song of the *pururi* 'a type of bird with onomatopoeic name' is a sign of high probability of the presence of the *páki* 'peccary', whose flesh is one of the favorite dishes in the community.

(37) *esát páki* 'type of peccary' (*Pecari tajacu*)
summer – peccary

(38) *páki pururi* 'type of bird' (unidentified)
peccary – bird

4.3 Specific cases of ethnozoological names

In addition to all the binomials reviewed, in our corpus, there are two specific constructions. Both ethnobiological names are constructions with genitive and differ semantically from the revised binomials in that their elements do not reveal the identity of the named referent. In (39), *yumí dukuji* 'mother of water' is the name

of a larva that is temporarily concentrated on the banks of the rivers. Apparently, in this compound, a sign metonymy is activated, since the speakers affirm that, when they observe these larvae, they know there will be plenty of water (through rain). Considering the myths related to water, as well as possible threats to the stability of water in their territory, it is understandable that the Aguaruna people have lexicalized the expression *yumí dukují* to name a biological species that is an indicator of abundance of water. After all, this species is conceived as a mother who has a resource that, on the one hand, is sacred and, on the other, vital:

(39) *yumí duku-jí* 'water bug' (*Belostomatidae* sp.) (Lit.: mother of water)
water – mother.GEN

On the other hand, in (40), *iwanchí tugkuiji* 'devil's stick' is the name of an insect that has an elongated body and legs very similar to thin brown branches. In this sense, there is a metaphorical correspondence between the plant element *tugkui* ´stick´ and the insect, based on its similarity in shape, pattern, and color. Speakers state that, of all varieties, this is the most difficult to identify, due to their natural camouflage conditions:

(40) *iwanchí tugkuí-ji* 'type of stick insect' (*Apioscelis* spp.) (Lit.: Devil's Stick)
devil – stick.GEN

Regarding the presence of the *íwanch*,[7] this is explained by the diabolical being playing with appearances to deceive men (Chumap and García-Rendueles 1979). For speakers, that would be the reason why there are 'false' plants very similar to the original ones. For example, *iwanchí kukushji* 'devil's cocona', *iwanchí papaiji* 'devil's papaya', and *iwanchí munchiji* 'devil's passionfruit' are fruits harmful to human consumption, and they are more dangerous because they are extremely similar to their original versions: cocona, papaya and passionfruit.

So, *iwanchí tugkuíji* is an insect that can be deceiving because it looks like a thin branch. According to our collaborators, the damage caused by the insect is the confirmation of death. That is, if a person sees the insect, he/she would realize that he/she is dead. The *íwanch*, therefore, is a being that causes harm and for that purpose it uses the game of appearances.

7 We have already referred to this mythological being in binomial constructions in (29) and (30).

5 Conclusion

In this chapter, we have presented an analysis of resemblance metaphors and metonymies that operate in ethnozoological names of the Amazonian language Aguaruna, basically in binomials of the structure $[N_{(MOD)}\ N_{(HEAD)}]_N$. The lexical preference for this type of compounds to name animal and plant organisms has already been shown to stand out in Amazonian languages (Valenzuela 1998, Zariquiey 2018). In general, in these binomials, the modifying noun is the element that concentrates the metaphorical or metonymic load, while the head noun literally identifies a taxonomic category (*generic* or *life-form*) that includes the referent named by the entire compound.

First, following the proposal of Ureña and Faber (2010), we grouped resemblance metaphors into three classes: (i) *prototypical image metaphors* (color and shape) and what we have called *non-prototypical* ones (texture, pattern, flavor), (ii) *behavior based-metaphors* (with dynamic images), and (iii) *metaphors with physical and behavioral motivations*. The distribution shows that most resemblance metaphors select a static image of an entity (source domain) to metaphorically project it onto the named biological organism (target domain). Of the 72 binomials that have resemblance metaphors, 67 correspond to the image metaphor group. Of this group, most cases are prototypical, that is, they consider color and shape as a prominent feature. To a lesser extent, there are non-prototypical cases that consider texture, pattern, and flavor. However, there are cases where these features interact. That is, the perception of speakers jointly takes into account color and form, texture and color, or form and texture to name a particular species. This joint participation of color, shape, and texture traits is consistent with the visual metaphors that Turpin (2013) analyzes in the semantic extensions of plant and animal names in the Kaytetye language.

In this group of *image metaphors* (prototypical), the prevalence of color is not only linked to the perception of the environment (animals, plants, stones) but also to knowledge with a cultural and mythological basis. At this point, the regular presence of the *ipák* 'annatto' and *súa* 'genip' plants is significant. The data show relatively systematic mapping of *ipák* and *súa* to map colors (red and black, respectively) in various species. After color, shape is the most prominent image in metaphorical mappings. The data show an important regularity in the denomination of several types of wasp. Essentially, the speakers select the shape of the nests and establish the similarity with various elements (basket, plate, animal head, human head, etc.). In this case, the nest is a metonymic vehicle that allows us to access and identify the insect. It should be noted that the perception of the nest for naming a type of wasp was also recorded by Valenzuela (1998), who presents a case in the Amazonian language Shipibo. This gives rise to the

need to verify whether the identification of wasps through their nests is a constant in Amazonian nomenclatures.

As for the group of *behavior-based metaphors*, we have only found four cases. In these occurrences, the behavior of animals and that of a mythological being (*íwanch*) have been mapped. This shows that the selection of elements of the source domain projecting onto the target domain is more complex and, in two cases, exceeds the sensory perception. This last feature is also seen in our specific cases, which are constructions with genitive (*yumí dukují* and *iwanchí tunkuíji*) that require deep cultural and mythological information for the recovery of their semantic motivation. On the other hand, it should be noted that we have only found one case of *metaphor with physical and behavioral motivations*.

In our analysis, we have also detected an important group of binomials (18 cases) in which the modifying noun presents the metonymic load; that is, it is an element that operates within an ICM (Benczes 2006). The interesting thing about these cases is the systematic presence of two types of metonymy: HABITAT FOR INHABITANT and FOOD FOR CONSUMER. This means that speakers have lexicalized information on the habitat and diet of ethnozoological organisms because it is essential for hunting, for being alert to possible dangers, or for organizing the copious knowledge of the Amazonian environment they have. Additionally, although to a lesser extent, we have found some sign metonymies linked to meteorological occurrences (summer and rainfall), important data for daily activities in the community.

Likewise, it is necessary to highlight two aspects that emerge from our analysis. The first is the predominance of the *generic* category as a head noun of the binomials, data that correspond to the findings of Berlin (1992). However, there is also a significant number of head nouns that name a *life-form* category. In both cases, these head nouns are modified by a noun that mostly names generic or specific levels, and which contains the metaphorical or metonymic charge. In this way, with the union of the head noun and the modifier, the speaker basically manages to subcategorize his/her ethnozoological reality. The second aspect to highlight is the recurrence of some significant references that are presented as head nouns. The most subcategorized references are *mánchi* 'lobster', *jémpe* 'hummingbird', *chígki* 'bird', *éte* 'wasp', and *dápi* 'snake'. These five names appear in 44 binomials, which evidences their high ethnozoological importance for the community. As for the modifying noun, the most relevant and productive ones are *jápa* 'deer', *ipák* 'annatto', *súa* 'genip', and *dúka* 'leaf'. These four expressions appear in 17 binomials, a number to consider.

In summary, our findings show the complex system of resemblance metaphors and metonymies that operate in the Aguaruna ethnozoological lexicon, in which the mapping of biological domains (animal and plant) and cultural refer-

ences of the community come into play. In this sense, from the lexicon studied, our analysis contributes to the understanding of Aguaruna speakers' deep ethnozoological knowledge and, in turn, some of the conceptualization of their environment.

References

Asociación Interétnica de Desarrollo de la Selva Peruana (Aidesep). 2011. *Diccionario awajún-castellano*. Iquitos: Aidesep.

Barreto, Rocío. 2009. *Ocupación histórica del pueblo indígena awajún en las comunidades del Alto Mayo*. https://www.academia.edu/4678933/Ocupaci%C3%B3n_hist%C3%B3rica_del_pueblo_ind%C3%ADgena_Awaj%C3%BAn_en_las_comunidades_del_Alto_Mayo (accessed 10 July 2019)

Benczes, Réka. 2006. *Creative compounding in English: The semantics of metaphorical and metonymical noun-noun combinations*. Amsterdam & Philadelphia: John Benjamins.

Berlin, Brent. 1992. *Ethnobiological classification. Principles of categorization of plants and animals in traditional societies*. Princeton: Princeton University Press.

Berlin, Brent & Elois Ann Berlin. 1979. *Aspectos de la etnobiología aguaruna*. Berkeley: Universidad de California.

Berlin, Brent & Paul Kay. 1969. *Basic Color Terms: Their universality and evolution*. Berkeley: University of California Press.

Berlin, Brent, Dennis Breedlove & Peter Raven. 1973. General principles of classification and nomenclature in folk biology. *American Anthropologist* 75 (1). 214–242.

Bernárdez, Enrique. 2005. Social cognition: variation, language, and culture in a cognitive linguistic typology. In Francisco J. Ruiz de Mendoza and Sandra Peña Cervel (eds.), *Cognitive linguistics. Internal dynamics and interdisciplinary interaction*, 191–224. Berlin & New York: Mouton de Gruyter.

Bernárdez, Enrique. 2016. From butchers and surgeons to the linguistic method. In Manuela Romano & Maria Dolores Porto (eds.), *Exploring discourse strategies in social and cognitive interaction: Multimodal and cross-linguistic perspectives*, 21–38. Amsterdam & Philadelphia: John Benjamins.

Biggam, Carol. 2012. *The semantics of colour: A historical approach*. Cambridge: Cambridge University Press.

Boster, James. 2005. *Categories and cognitive anthropology*. In Henri Cohen & Claire Lefebvre (eds.), *Handbook of categorization in cognitive science*, 92–118. Amsterdam: Elsevier

Brown, Michael. 2014. Upriver: *The turbulent life and times of an Amazonian people*. Cambridge: Harvard University Press.

Creed-Kanashiro, Hilary, Marion Roche, Irma Tuesta & Harriet Kuhnlein. 2009. Traditional food system of an Awajun community in Peru. In Harriert Kuhnlein, Bill Erasmus & Dina Spigelski (eds), *Indigenous peoples' food systems: The many dimensions of culture, diversity and environment for nutrition and health*, 59–81. Roma: FAO.

Chumap, Aurelio & Manuel García-Rendueles. 1979. *"Duik múun. . ." Universo mítico de los aguarunas*. Lima: CAAAP.

Corbera Mori, Angel. 1994. *Fonologia e gramática do Aguaruna (Jívaro)*. Campinas: Universidade Estadual de Campinas PhD thesis.
Cuenca, Maria & Joseph Hilferty. 2007. *Introducción a la lingüística cognitiva*. Barcelona: Ariel.
Dauphiné, Nico. 2008. *Bird ecology, conservation, and community responses to logging in the northern Peruvian Amazon*. Georgia: University of Georgia.
Elliot, Jorge. 1998. Los recursos forestales en las comunidades nativas aguarunas del Alto Mayo. *Tecnología y Sociedad: la revista del ITDG- Perú* 4. 18–21.
Evans, Nick. 1997. Sign metonymies and the problem of flora-fauna polysemy in Australian linguistics. In Darrell Tryon & Michael Walsh (eds.), *Boundary rider. Essays in honour of Geoffrey O'Grady*, 133–153. Canberra: Australian National University.
Fleck, David. 2007. Field linguistics meets biology: How to obtain scientific designations for plant and animal names. *Language Typology and Universals* 60 (1). 81–91.
García, Renán. 1978. Cuatro estudios sobre avispas sociales del Perú (hymenoptera: vespidae). *Revista Peruana de Entomología* 21 (1). 1–22.
Grady, Joseph. 1999. A typology of motivation for conceptual metaphor: Correlation vs. resemblance. In Raymond W. Gibbs, Jr. and Gerard J. Steen (eds.), *Metaphor in cognitive linguistics*, 79–100. Amsterdam & Philadelphia: John Benjamins.
Guasparri, Andrea. 2007. Etnobiologia e mondo antico: una prospettiva di ricerca. *Annali Online di Lettere – Ferrara Speciale* II (2). 69–90.
Guasparri, Andrea. 2019. Polysemy revisited. Metaphor and descriptiveness in folk animal naming. *Altorientalische Forschungen* 46 (1). 61–87.
Hunn, Eugene & Cecil Brown. 2011. Linguistic ethnobiology. In Eugene Anderson, Deborah Pearsall, Eugene Hunn & Nancy Turner (eds), *Ethnobiology*, 319–333. Nueva Jersey: Wiley-Blackwell.
Instituto Nacional de Estadística e Informática (INEI). 2018. *Perú, perfil sociodemocrático 2017*. Lima: INEI.
Julià, Carolina. 2009. El cuerpo humano en la creación y motivación de los nombres románicos de insectos. *Revue de Linguistique Romane* 73. 321–369.
Kövecses, Zoltán. 2010. *Metaphor: A practical introduction*, 2nd edn. Oxford: Oxford University Press.
Kövecses, Zoltán. 2013. The metaphor-metonymy relationship: Correlation metaphors are based on metonymy. *Metaphor and Symbol* 28 (2). 75–88.
Lakoff, George & Mark Johnson. 1980. *Metaphors we live by*. Chicago: University of Chicago Press.
Lakoff, George. 1987. *Women, fire and dangerous things*. Chicago: University of Chicago Press.
Littlemore, Jeannette. 2015. *Metonymy: Hidden shortcuts in language, thought and communication*. Cambridge: Cambridge University Press.
Luque, Juan. 2001. *Aspectos universales y particulares del léxico de las lenguas del mundo*. Granada: Método Ediciones.
Mihatsch, Wiltrud. 2016. Types of motivation in folk plant taxonomies. In Päivi Juvonen & Maria Koptjevskaja-Tamm (eds.), *The lexical typology of semantic shifts*, 457–492. Berlin & Boston: Mouton de Gruyter.
Ministerio de Educación del Perú (Minedu). 1996. *Diccionario aguaruna-castellano castellano-aguaruna*. Lima: ILV.
Overall, Simon. 2007. *A grammar of Aguaruna*. Melbourne: La Trobe University PhD thesis.
Patton, James, Brent Berlin & Elois Ann Berlin. 1981. Aboriginal perspectives of a mammal community in Amazonian Peru: Knowledge and utilization patterns among the Aguaruna

Jívaro. In Michael Mares & Hugh Genoways (eds.), *Mammalian biology in South America*, 111–128. Pittsburgh: University of Pittsburgh.

Radden, Günter & Zoltán Kövecses. 1999. Towards a theory of metonymy. In Klaus-Uwe Panther and Günter Radden (eds.), *Metonymy in language and thought*, 17–59. Amsterdam: John Benjamins.

Schmid, Hans-Jörg. 2007. Entrenchment, salience and basic levels. In Dirk Geeraerts & Hubert Cuyckens (eds.), *The Oxford handbook of cognitive linguistics*, 117–138. Oxford: Oxford University Press.

Tercedor, Maribel, Clara López, Carlos Márquez & Pamela Faber. 2012. Metaphor and metonymy in specialized language. In Pamela Faber (ed.), *A cognitive-linguistics view of terminology and specialized language*, 33–72. Berlin: Mouton de Gruyter.

Turpin, Myfany. 2013. Semantic extension in Kaytetye flora and fauna terms. *Australian Journal of Linguistics* 33 (4). 488–518.

Ungerer, Friedrich & Hans-Jörg Schmid. 2006 [1996]. *An introduction to cognitive linguistics*, 2nd edn. London: Pearson Longman.

Ureña, José M. & Pamela Faber. 2010. Reviewing imagery in resemblance and non-resemblance metaphor. *Cognitive Linguistics* 21 (1). 123–149.

Ureña, José M. 2011. *Metaphor in specialised language: An English-Spanish comparative study in marine biology*. Granada: University of Granada PhD thesis.

Valenzuela, Pilar. 1998. Luna-avispa y tigre-machaco: compuestos semánticos en la taxonomía shipiba. In Zarina Estrada, Max Figueroa, Gerardo López & Andrés Costa (eds.), *IV Encuentro Internacional de Lingüística del Noroeste*, vol. 2, 409–428. Sonora: UniSon.

Zariquiey, Roberto. 2018. *Etnobiología del pueblo Kakataibo. Una aproximación desde la documentación de lenguas*. Lima: PUCP.