



HAL
open science

Nouns denoting more than one species : A comparative approach (English/French)

Célia Hoffstetter

► **To cite this version:**

Célia Hoffstetter. Nouns denoting more than one species : A comparative approach (English/French). Humanities and Social Sciences. 2013. dumas-02047901

HAL Id: dumas-02047901

<https://dumas.ccsd.cnrs.fr/dumas-02047901>

Submitted on 25 Feb 2019

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

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

**NOUNS DENOTING MORE THAN ONE SPECIES:
A COMPARATIVE APPROACH (ENGLISH/FRENCH)**

Célia Hoffstetter

Supervised by Laure Gardelle

Table of contents

Introduction	9
Chapter 1	11
I. The classical approach to categorization.....	11
1. Theoretical tenets	11
a. Essence and accidents	11
b. Basic assumptions	12
c. Abstractness	13
2. Objections to the classical approach	13
II. Prototype theory	16
1. Theoretical tenets	16
a. “Principle of cognitive economy” and vertical dimension.....	16
b. “Principle of perceived world structure” and horizontal dimension	18
c. Why prototype categories?	20
2. Objections to the standard prototype theory	23
a. The nature of prototypes	23
b. The notion of similarity, or resemblance	24
3. Attempts to reconcile prototype theory with the classical approach	26
a. Schemas.....	26
b. Core and identification procedure	28
c. Expert and folk categories.....	28
III. Radial categories and the theory of idealized cognitive models	30
1. Idealized cognitive models	30
a. Matches and mismatches between models.....	31
b. Cluster models.....	31
c. Metonymic models	32

2.	Radial categories	32
a.	Definition	32
b.	Example.....	33
3.	“Addressing the problems with prototype theory”	37
Chapter 2		39
I.	Methodology and corpus presentation	39
1.	Corpus	39
2.	Methodology	42
II.	Nouns denoting animal species in general (without regard to sex or age).....	45
1.	“Animal”	45
a.	Definition	45
b.	Google search	47
2.	“Creature”	49
a.	Definition	49
b.	Google search	50
3.	“Beast”	53
a.	Definition	53
b.	Google search	55
4.	“Pet”	57
a.	Definition	57
b.	Google search	57
5.	“Deer”	59
a.	Definition	59
b.	Google search	59
6.	“Bug”	63
a.	Definition	63
b.	Google search	65

III.	Nouns denoting either male or female animals	67
1.	“Cock” & “hen”	67
a.	Definition	67
b.	Google search	73
2.	“Bull” and “cow”	79
a.	Definition	79
b.	Google search	81
3.	“Dog” and “bitch”	83
a.	Definition	83
b.	Google search	84
4.	“Tom”	85
5.	“Boar” and “sow”	87
a.	Definition	87
b.	Google search	88
6.	“Jack” and “jenny”; ”jack” and “gill”/“jill”	90
a.	Definition	90
b.	Google search	93
7.	“Buck” and “doe”	95
a.	Definition	95
b.	Google search	97
8.	“Stag” and “hind”	98
a.	Definition	98
b.	Google search	99
9.	“Stallion” and “mare”	99
a.	Definition	99
b.	Google search	100
10.	“Sire” and “dam”	102

a.	Definition	102
b.	Google search	103
IV.	Nouns denoting young animals (as opposed to adults)	105
1.	“Chick”	105
a.	Definition	105
b.	Google search	105
2.	“Calf”	106
a.	Definition	106
b.	Google search	106
3.	“Pup” / “puppy” / “whelp”	108
a.	Definition	108
b.	Google search	109
4.	“Kit” / “kitten”	111
a.	Definition	111
b.	Google search	112
5.	“Foal” / “colt”	112
a.	Definition	112
b.	Google search	113
6.	“Cub”	113
a.	Definition	113
b.	Google search	114
7.	“Joey”	115
a.	Definition	115
b.	Google search	115
8.	“Hatchling”	117
a.	Definition	117
b.	Google search	118

Conclusion.....	120
Bibliography.....	132

List of figures and tables

Figure 1: The vertical dimension	16
Figure 2: The horizontal dimension	19
Figure 3: Radial network for the category [MOTHER]	33
Figure 4: Example for chaining in the Dyirbal category [BALAN]	37
Figure 5: Chaining in the category [BUG].....	64
Table 1: Corpus of nouns denoting more than one species.....	40
Table 2: Definitions of "bird" and "oiseau"	41
Table 3: Definitions of "animal"	45
Table 4: Definitions of "animal" (2).....	46
Table 5: Search "animal".....	48
Table 6: Definitions of "creature" and "créature"	49
Table 7: Search "creature".....	51
Table 8: Definitions of "beast" and "bête"	54
Table 9: Search "beast", literal use.....	55
Table 10: Search "beast", metaphorical use	56
Table 11: Search "pet".....	58
Table 12: Definitions of "deer" and "cervidé"	59
Table 13: Search "deer"	61
Table 14: Definitions of "bug"	63
Table 15: Definition of "insecte"	64
Table 16: Search "bug".....	66
Table 17: Definitions of "cock" and "coq"	69
Table 18: Definitions of "hen" and "poule"	71
Table 19: Search "cock bird".....	76
Table 20: Search "hen bird"	78
Table 21: Definitions of "bull" and "taureau"	80
Table 22: Definitions of "cow" and "vache"	80

Table 23: Search "bull"	81
Table 24: Search "cow"	83
Table 25: Definitions of "dog" and "chien"	83
Table 26: Definitions of "bitch" and "chienne"	84
Table 27: Definitions of "tom" and "chat"	86
Table 28: Definitions of "boar" and "porc"	87
Table 29: Definitions of "sow" and "truie"	87
Table 30: Search "sow bear"	89
Table 31: Search "bear sow"	90
Table 32: Search "bear boar"	90
Table 33: Definition of "jack"	92
Table 34: Definition of "jenny"	92
Table 35: Definition of "gill/jill"	93
Table 36: Search "weasel"+"the jill"	95
Table 37: Definitions of "buck"	96
Table 38: Definitions of "doe"	96
Table 39: Search "kangaroo"+"the buck"	98
Table 40: Definition of "stag"	98
Table 41: Definition of "hind"	98
Table 42: Search "stag"	99
Table 43: Definitions of "stallion" and "étalon"	100
Table 44: Definitions of "mare" and "jument"	100
Table 45: Search "zebra"+"the mare"	102
Table 46: Definitions of "sire" and "dam"	102
Table 47: Search "female"+"dam"	104
Table 48: Search "male"+"sire"	104
Table 49: Definitions of "chick" and "poussin"	105
Table 50: Definitions of "calf" and "veau"	106
Table 51: Search "calf"	107
Table 52: Definitions of "pup", "puppy", "whelp" and "chiot"	108
Table 53: Search "pup"	110
Table 54: Definitions of "kit", "kitten" and "chaton"	111
Table 55: Definitions of "foal", "colt" and "poulain"	112
Table 56: Definitions of "cub" and "renardeau"	114

Table 57: Search "cub"	115
Table 58: Definition of "joey"	115
Table 59: Search "animal"+"the joey"	117
Table 60: Definition of "hatchling"	117
Table 61: Search "hatchling"	119

Introduction

Whenever we see something, whenever we speak or even just think about something, our mind summons up mental constructs, known as categories : this process, which constitutes the basis of human cognition, is called categorization (see for instance Lakoff 1987: 5).

In linguistics, the noun is defined as designating a category, or class. According to the traditional view, a category is a group of entities sharing a certain number of properties or characteristics (Croft and Cruse 2004: 74). Hence, for example, using the noun “dog” implies that the referent is considered to have all the characteristics necessary to be a member of the category “dog”.

This notion of grouping individuals together on the basis of shared characteristics appears to be more obvious, conscious and rigorous as far as animals (and all living beings in general) are concerned. Indeed, this is precisely the purpose of taxonomy, a discipline of biology which classifies living organisms into classes (for example, *Mammalia*), orders (*Carnivora*), families (*Canidae*), genres (*Canis*) and species (*Canis Lupus*). Species constitute the last rank of the taxonomical hierarchy. They are defined as groups of animals sharing common properties which distinguish them from other species (*OED* 2013, entry *species*).

One of the basic principles of taxonomy consists in attributing one specific name to each distinct species. However, in everyday use, a single designation frequently applies to several species which, in some cases, happen to be very different from each other: this is what I am interested in here. For example, the noun “cow” in English refers to the female of the *Bos Taurus*, but also to the female of other species like the elephant or the whale, which may appear quite surprising on the face of it, especially to French speakers who apparently have no exact equivalent of such a noun in their own language. In this dissertation I adopt a comparative approach (English/French), which enables me to see whether the groupings of animal species made in English can be found again in French and, if not, how different they are. I will take English as a point of reference in this comparison because cases of nouns denoting more than one species appear to be more frequent in this language; besides, I have chosen to compare English to French for it seemed interesting to me to study the differences in the ways two neighbouring countries categorize animals. In my study I included several nouns indicating sex (like “cow” and “bull”) or young age (like “calf”) but also more general

nouns, like “creature” for instance. On the other hand, I have chosen to exclude nouns pointing exclusively to expert categories, that is to say biological genres or higher ranks in the taxonomical hierarchy (like “mammal”, “reptile”, “mollusc”...), because they are quite similar in both languages. Indeed, the purpose of this dissertation is to focus on the particularities of cross-species nouns in English as compared to French and examine the nature of the links uniting their various referents.

Are there any principles underlying these groupings? How do existing theories of categorization help formalize those principles, and can they be applied to all the nouns? What does this reveal about the different ways English and French categorize?

The first chapter of this dissertation will provide a theoretical background to the study by giving an account of the various theories of categorization. Then the second chapter will provide a corpus-based analysis. It will present the methodology used, then give a list of nouns denoting more than one species in English and of their correspondents in French, and analyze them in the light of such theories.

Chapter 1

The present chapter provides a detailed introduction to the three main theories of linguistic categorization, which succeeded one another from ancient times to today: the classical theory (whose first principles were defined by Aristotle), prototype theory (initiated by cognitive psychologist Eleanor Rosch in the 1970s) and finally George Lakoff's theory of idealized cognitive models. In each part, the content of a theory will first be exposed; then the limits and problems it raises will be presented.

I. The classical approach to categorization

The classical theory goes back to the time of Aristotle: it prevailed in psychology, philosophy and linguistics until Eleanor Rosch's findings in the 1970s (see for instance Croft and Cruse 2004: 76).

1. Theoretical tenets

a. Essence and accidents

The most basic principle of the classical theory consists in the important distinction between, on the one hand, the **essence** of a thing and, on the other hand, its **accidents** (Taylor 1995: 22).

In the *Metaphysics*, Aristotle defines essence as “all parts immanent in things which define and indicate their individuality and whose destruction causes the destruction of the whole” (quoted by Taylor 1995: 22). In short, the essence of a thing is a property or set of properties which makes the thing what it is and is therefore necessary and sufficient to define it. Conversely, accidents are incidental particularities which may be observed in a thing, but play no part in its definition.

The example given by Aristotle is the category “man”, whose essence is “two-footed animal”; the colour of the skin or hair, for instance, are accidents. Therefore, in order to determine whether *X* is a man (in other words, whether *X* belongs to the category [MAN]), one must check whether *X* possesses the feature /two-footed/ and the feature /animal/, which are the two features mentioned in the definition of the word “man”. If *X* possesses both

features, then *X* is a man. If, on the contrary, *X* does not meet these two criteria, or even only one of them, then *X* is not a man.

b. Basic assumptions

As a logical system, the classical approach to categorization implies the following statements:

- “An entity represents a category member by virtue of fulfilling **a set of necessary and (jointly) sufficient conditions** for category membership” (Evans and Green 2006: 251). This means that all the members of a category, without exception, have a precise set of properties in common, and for any potential member, possessing all these properties (or features) is both necessary and sufficient to enter the category: accidents, or incidental properties which are particular to one individual or another, do not count.

- “A thing cannot possess a feature and not possess it, it cannot both belong to a category and not belong to it.” (Taylor 1995: 23). This is a formulation of the law of contradiction, a logical principle introduced by Aristotle. It goes together with the law of the excluded middle: “A thing must either possess a feature or not possess it, it must either belong to a category or not belong to it.” (Taylor 1995: 23). This implies that **features are binary**: they only have two possible values, present (+) or absent (-). For example (Croft and Cruse 2004: 76): [COLT] is defined by the features /equine/, /male+/, /adult-, whereas [FILLY] is defined by the features /equine/, /male-, /adult-, [MARE] by /equine/, /male-, /adult+/ and [STALLION] by /equine/, /male+/, /adult+.

- **Categories have clear and rigid boundaries.** This means that “there are no ambiguous cases which ‘in a way’ or ‘to some extent’ belong to the category, but which in another way do not” (Taylor 1995: 23). The categorization system as defined by the classical theory is characterized by a strict, reasoned order in which every entity holds a definite, delimited place: in fact, the coherence of the whole system depends on each element being assigned one determined place.

- Consequently, **all members of a category have equal status**, that is to say “there are no better members of the category than others” (Taylor 1995: 24), because all members share the same common properties while accidental properties, which differ from one member to another, are deliberately not taken into account.

c. Abstractness

As the classical categorization system is entirely governed by the logical principles explained above, it is also characterized by its universality and abstractness. Let us consider, for example, the word “bachelor”, which is defined by four features: /human/, /male/, /adult/ and /never married/ (see for instance Taylor 1995: 31). The sentence “This bachelor is a man” is necessarily true, independently of any extra-linguistic reality, because the features /human/, /adult/ and /male/ are the necessary and sufficient conditions to be part of the category [MAN], and they are also part of the features necessarily shared by all the members of the category [BACHELOR]. As for the sentence “This bachelor is my sister”, it is necessarily false (again, independently of any extra-linguistic reality), because /male+/ is a feature of the category [BACHELOR] whereas /male-/ is a feature of the category [SISTER]: since /male+/ and /male-/ are incompatible, it is strictly contradictory to belong to both categories at the same time. These two sentences show well that, according to the classical theory, empirical reality is not needed to determine the truth, since it appears as purely logical within the linguistic system.

2. Objections to the classical approach

The classical approach to categorization raises many difficulties, which are the following:

- The “**definitional problem**” (Evans and Green 2006: 252). For many concepts, especially everyday words, it is very difficult (if not impossible), first to identify features that are shared by all the members of the category, then to be sure that they are sufficient to define this category. The most famous example is that provided by Ludwig Wittgenstein (1958: 66) on the category [GAME] (quoted in Evans and Green 2006: 252). Wittgenstein asks this simple question: is there, after all, any feature common to all members of the category ? First he considers the feature /amusing/: indeed most games are supposed to be amusing, but chess, for instance, is not necessarily. Then he wonders if all games share the property of winning and losing, or competition between players: this is indeed the case with chess, but not anymore, for instance, when a child throws a ball at the wall and catches it again (a game which, in a way, is amusing). Finally, he considers skill and luck as probable common properties, but notes the difference of nature between skill at chess and skill at tennis, for example, which cannot really be compared. After going through all sorts of games, he finally concludes that there is no single necessary condition of membership shared by all members of

the category, but rather “family resemblances”, which are like multiple “relationships”, “similarities” that “crop up and disappear” as one goes from one member to another, so that they are indeed all linked together, but not by one single common property. Wittgenstein’s study evidences the fact that the classical approach cannot satisfactorily explain the organization of all categories. This does not mean that the classical theory is inappropriate for all categories, nor that there are absolutely no principles underlying the groupings of concepts into categories, quite the opposite: linguistic categorization is indeed ruled by a certain logic and coherence (after all, each member of the category [GAME] has one property in common with at least one of the other members), but it does not appear as regular, as systematic or as predictable as expected by the classical theory.

- The problem of **necessary and sufficient conditions**. If, as claimed by Aristotle, the feature /two-legged/ is necessary to the definition of the concept “man”, one may ask the question of how to deal with a man who has lost his two legs and cannot walk: according to the classical theory, which states that the “destruction” of one of the essential features of a thing causes the “destruction of the whole”, such a case should logically not be considered as a man anymore, and yet we have the impression that the concept of “man” is something more complex than a restricted list of necessary and sufficient features. Besides, it appears that, while some features may not be necessary for category membership, they are nevertheless expected, like the ability to bark in the case of the category [DOG], whereas some features may not be excluded but are unexpected (Taylor 1995: 36): can such properties really be considered as merely “accidental”? In fact, although the classical theory works well for some concepts (like mathematical categories, for instance [ODD NUMBER] and [EVEN NUMBER]), in many other cases the conditions for category membership appear to be less clear-cut than they are in the classical theory.

- The “problem of **conceptual fuzziness**” (Evans and Green 2006: 253) occurs when we are confronted with borderline cases and we are not exactly sure whether they belong to a certain category or not. For instance, it is not obvious that animals like penguins or ostriches, neither of which can fly, are members of the category [BIRD] in the same way as sparrows and robins, while animals like bats, which can fly, do not belong to this category. Such situations challenge the principle of clear, rigid category boundaries which is nevertheless characteristic of the classical theory.

- The “**problem of prototypicality**” (Evans and Green 2006: 254). It is “related to the problem of conceptual fuzziness, but while the problem of conceptual fuzziness concerns what happens at the boundaries of a category, the problem of prototypicality concerns what happens at the centre of a category” (Evans and Green 2006: 254). Indeed, it has been observed that within a given category, people generally identify certain members as better examples than others (like “chair” and “table” in the category [FURNITURE], or “robin” and “sparrow” in the category [BIRD]). This phenomenon consisting of “better examples” (or prototypes) standing out in a category is called **centrality** (Lakoff 1987: 12) and, surprisingly enough, it also occurs in categories which have nevertheless very clear boundaries, like the category [EVEN NUMBER], in which it has been proved that “2” is considered as a better example than 98 or 10 002, for instance. Prototypicality calls into question the classical principle mentioned above which states that all members of a category have equal status.

- The “problem of **psychological reality**” (Laurence and Margolis, in Evans and Green 2006: 254). It means that no experimental evidence has ever managed to confirm the existence of a structure corresponding to the classical theory in human psychology. For example, contrary to what might be expected, words with a smaller set of features are not recognized more rapidly in word-recognition experiments than words with a greater number of features, which are nevertheless considered as more “complex” in the classical theory.

- The “problem of **ignorance and error**” (Laurence and Margolis, in Evans and Green 2006: 254), which consists in this apparent paradox: even while ignoring or mistaking the properties of a concept (that is to say its essential definition), it is still possible to know about this concept. For example, one can know quite precisely what a whale is while incorrectly believing that the concept “whale” belongs to the category [FISH] and not to the category [MAMMAL].

- Finally, the problem of drawing a line between the meaning of a word, as part of an **abstract linguistic system**, and its referent in the **extra-linguistic reality**. This problem, which is related to the previous one, challenges the “abstractness dogma” of the classical theory by questioning the possibility of really knowing the meaning of a word or the truth of a sentence independently of one’s acquaintance with “the relevant facts of the world” (Taylor 1995: 37).

II. Prototype theory

This theory of categorization has prevailed since the founding principles of the classical, Aristotelian theory were called into question. Although the very first experiments on prototype theory were carried out by Eleanor Rosch and her colleagues, it was adopted and appropriated by many other researchers.

1. Theoretical tenets

- a. “Principle of cognitive economy” and vertical dimension (Evans and Green 2006: 254)

The principle of **cognitive economy** is the first of the two pillars of prototype theory. It states that “an organism, like a human being, attempts to gain as much information as possible about its environment while minimising cognitive effort and resources” (Evans and Green 2006: 254). This principle explains why all human beings, instead of “storing separate information about every individual stimulus”, naturally tend to “group similar stimuli into categories” (Evans and Green 2006: 254). In fact, the very reason why the human cognitive system is made of categories is to be found in the principle of cognitive economy.

The direct implication of this principle is that our categorization system has a **vertical dimension** based on what Eleanor Rosch calls the “**level of inclusiveness**” (1976).

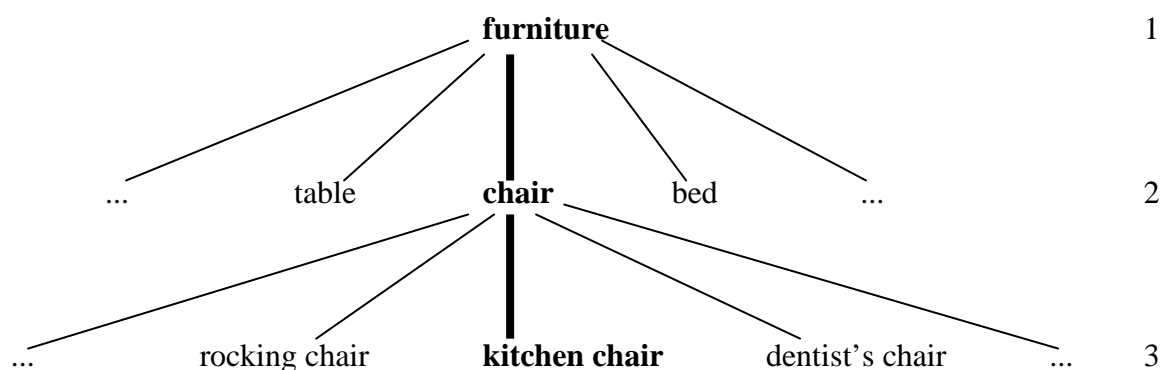


Figure 1: The vertical dimension

In this example, the category [FURNITURE] includes several categories, among which is the category [CHAIR], which includes itself several categories, among which is the category [KITCHEN CHAIR].

The higher up the vertical axis a category is, the more inclusive it is (that is to say, the more categories are included, or subsumed within it) (Evans and Green 2006: 256). Therefore, [FURNITURE] is more inclusive than [CHAIR], which is itself more inclusive than [KITCHEN CHAIR].

Among the three levels of inclusiveness represented in this vertical axis, only one is considered to “provid[e] optimum cognitive economy” (Evans and Green 2006: 257). This optimal level of inclusiveness is the one in the middle of the axis and is called the **basic level** of categorization. [CHAIR], for example, is a basic level category.

Categories higher up in the axis are called **superordinate categories** ([FURNITURE], for instance), while categories lower down are called **subordinate categories** ([KITCHEN CHAIR], for instance).

Superordinate categories are characteristically the most inclusive level; for example, the superordinate category [FURNITURE] has more members than the basic level category [CHAIR] or the subordinate category [KITCHEN CHAIR]. However, the superordinate level is also the level at which all the members of a category have the fewest attributes in common. For instance, the members of the category [FURNITURE] visibly share fewer features than the members of the category [CHAIR]; likewise, all the members of the superordinate category [MAMMAL] have very few features in common when compared to the members of the basic level category [DOG] or of the subordinate category [COLLIE].

Conversely, subordinate categories are characterized as being the less inclusive level, but also the level at which members have the highest number of features in common.

The basic level is defined as the middle way between these two extremes: it is the most inclusive level at which members of a category share the highest number of features (Evans and Green 2006: 257). Therefore, “it is the basic level at which, in the absence of specific reasons to the contrary, people normally talk about reality” (Downing 1977, quoted in Taylor 1995: 49). For instance, being shown a chair and asked what it is, any English speaker would spontaneously answer “It’s a chair” (basic level category) and not “It’s a piece of furniture” (superordinate category), although the latter is as correct as the former (Taylor 1995: 49).

Nevertheless, we may wonder why the basic level is more salient than the subordinate level which, after all, provides more detailed information. The answer lies again in the

principle of cognitive economy. At the subordinate level, entities within a particular category are very similar (a kitchen chair has much in common with another kitchen chair), as well as all the categories to one another (a kitchen chair has much in common with a dining room chair, a rocking chair etc.). At the basic level, entities within a particular category are very similar too (a chair has much in common with another chair). However, categories are quite different from one another (a chair does not have much in common with a table). “Crucially, for a category to achieve cognitive economy [...], it must share as many common within-category attributes as possible, while maintaining the highest possible level of between-category difference.” (Evans and Green 2006: 261). Therefore, while subordinate categories provide a great amount of information, they also demand more cognitive effort for identification (for instance, “it is easier to spot the differences between a chair and a lamp than between a desk lamp and a floor lamp”, Evans and Green 2006: 261). This is why the basic level, which best meets the criteria of cognitive economy, is the most salient and most informative level of categorisation. Eleanor Rosch calls this phenomenon “**cue validity**”: at the basic level, which is characterized by “maximized” similarity among category members and “minimized” similarity across categories, cue validity is highest, whereas it is low at the subordinate and superordinate levels (Lakoff 1987: 52).

What distinguishes basic level terms in language is that they are used more frequently in everyday life than other terms. They are generally shorter (often monolexemic), better remembered and also learnt earlier by children (Lakoff 1987: 46). Moreover, Eleanor Rosch’s experiments emphasized that “individual items are more rapidly categorized as members of basic level categories than as members of superordinate or subordinate categories” (Croft and Cruse 2004: 84), which may suggest that basic level terms are mobilized more easily by the cognitive system. Interestingly enough, the basic level is also the most inclusive level for which a clear mental image can be formed: for example, one cannot visualize a piece of furniture without thinking about a table, or a chair, or any other specific piece of furniture (Croft and Cruse 2004: 83). All these characteristics of basic level terms tend to confirm their particular importance in the human cognitive system.

b. “Principle of perceived world structure” and horizontal dimension (Evans and Green 2006: 255)

The principle of perceived world structure is the second pillar of prototype theory. It states that category formation and organization is based on humans’ experience of their

environment, and especially on the correlations they perceive in this environment. For example, “it is a fact about the world that wings most frequently co-occur with feathers and the ability to fly (as in birds), rather than with fur or the ability to breathe under water”, and this correlation between two features observable in the world has an influence over the inner organization of the category [BIRD] (Evans and Green 2006: 255).

The key idea here is that the world is not a mere sum of attributes (or features) which combine themselves into categories, following a logical principle of equal probability. On the contrary, the world has a structure consisting of correlations, some of which being more frequently observed than others: it is precisely this structure that is reflected in the human category system and gives rise to its second dimension, the **horizontal dimension**.

Hence, in the category [BIRD], some members (like robins and sparrows) are considered as more “central”, or “better examples”, than others (like penguins and ostriches), because they concentrate a large number of attributes which are frequently observed as correlative in members of the category [BIRD] (Evans and Green 2006: 267). These central members are called **prototypes**.

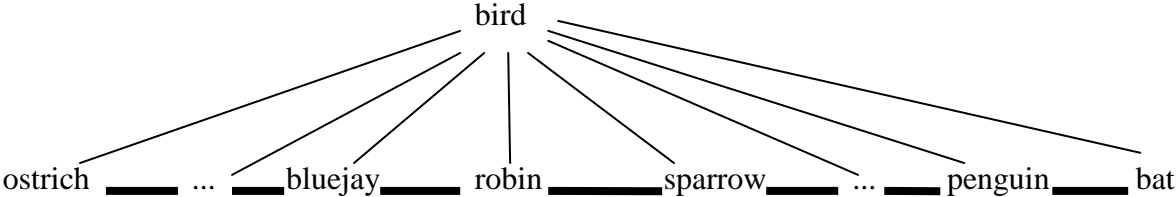


Figure 2: The horizontal dimension

Eleanor Rosch (1975) carried out a series of experiments in which American college students were given sixty members of a category and were asked to rate their “goodness-of-exemplar” along a scale from 1 (indicating that a member is a highly representative of the category) to 7 (indicating that a member is not very representative). In the category [BIRD], “robin” was considered as the most representative member, followed by “sparrow” and “bluejay”, whereas “ostrich” and “penguin” were in the bottom ten; as for “bat”, it was judged as the least representative member of the category (Evans and Green 2006: 266). Indeed, robins concentrate a large number of attributes that are considered as frequent in birds: they lay eggs, have beaks, feathers, two wings and two legs, they are small, they can fly and sing, they have short legs, short tails and short necks, and move on the ground by hopping. On the other hand, ostriches also lay eggs, have beaks, feathers, two wings and two legs, but do not

possess all other attributes, which explains why they are less central (Evans and Green 2006: 267). This fact that each member of a category is more or less central within the category boundaries is called **centrality gradience** (Lakoff 1987: 12).

As in the category [GAME] studied by Ludwig Wittgenstein, the members of the category [BIRD] visibly share “**family resemblances**”: each member has at least some (but not all) features in common with other members, so that they are all connected to one another in some way (Evans and Green 2006: 265). For example, ostriches lay eggs and have feathers, but they cannot fly and are not small; on the contrary, bats are small and they do fly, but do not lay eggs and have no feathers. In fact, both ostriches and bats share some features with robins, but not the same ones.

This reveals another specificity of prototype categories, which is they often have **fuzzy boundaries**. “In other words, we expect to reach a point at which, due to the absence of a significant number of shared characteristics, it becomes unclear whether a given entity can be judged as a member of a given category or not” (Evans and Green 2006: 267). For example, it is unclear whether ostriches and bats are members of the category [BIRD], although it is even less clear in the case of bats than of ostriches. This fact that some categories have no clear boundaries and are thus characterized by degrees of membership (each entity being more or less a member of the category) is called **membership gradience** (Lakoff 1987: 12). However, it is worth noticing that this phenomenon does not necessarily affect all prototype categories. Indeed, while some categories clearly have gradations of membership (like [TALL MAN], for instance, as there is no precise size limit definitely separating tall and short men), others are visibly not concerned by membership gradience, for example the category [US SENATOR]: one either is or is not a US senator, although certain members may be more representative (Zadeh in Lakoff 1987: 21).

c. Why prototype categories? (Taylor 1995: 51)

In his study of the category [GAME], Ludwig Wittgenstein wonders whether it is still possible or not to give a definition of the concept “game” after having proved that there is no single feature shared by all the members of the category: “How should we explain to someone what a game is? I imagine that we should describe *games* to him, and we might add: ‘This *and similar things* are called games’” (Wittgenstein 1978: 33, quoted in Taylor 1995: 40). In other words, a category’s definition is no longer based on a set of necessary and sufficient features, but on a few exemplars, which serve as an introduction to the whole category through

comparison. In fact, this radically changes our approach to concepts, since we no longer consider categories as pre-existing containers, in which entities may or may not enter following a certain number of criteria. On the contrary, we focus on members first, and consider that some of them can represent the entire category and serve as cognitive landmarks to find one's way into it, using family resemblances. This naturally raises the question: which members do we choose as exemplars, to represent the whole category and define what it is? It seems quite obvious not to choose borderline members of the category, but rather central, or prototypical members. But how are these prototypes determined? For instance, why are robins prototypical members of the category [BIRD], and not eagles or chickens, which after all are birds as well?

Eleanor Rosch's experiments showed that it takes people less time to verify that a robin (prototypical member) is a bird than to verify that a duck (marginal member) is a bird; moreover, when asked to list members of the category [BIRD], people very often mention "robin" first, which suggests that the category prototype is the first thing that comes to their minds when they mobilize a category (Taylor 1995: 45).

The first possible explanation may be that people encounter the word "robin" more frequently in everyday life than the words "eagle" or "ostrich". However, higher word frequency is rather a consequence of prototypicality than its cause. Besides, interestingly enough, what is prototypical is not necessarily what is usual or frequent. For example, Rosch noticed when analyzing children's drawings that they always picture the sky as blue, although in some places the sky is more often grey than blue: in this case, paradoxically, the sky is usually grey but prototypically blue (Taylor 1995: 53).

Another explanation for prototypicality may be that prototypes are learnt earlier than other members of a category and thus serve as references. But, again, there are numerous exceptions. For instance, "it seems unlikely [...] that children brought up with a Pekinese would go through life with a Pekinese as their dog prototype"(Taylor 1995: 53).

A third possibility may be that prototypes are average members of the category (Taylor 1995: 53). Nevertheless, this does not really work in the case of the category [BIRD], since for example robins are not birds of average colour nor of average size (on the contrary, they are among the smallest members of the category). Finally, one may explain prototypicality saying that prototypes concentrate features that are considered as more

important within a given culture (Taylor 1995: 53), but this, again, cannot be applied to all prototype categories.

In fact, none of these possible explanations appears to be completely satisfactory, which at least indicates that prototype categories are more varied, more complex but also more flexible than classical categories. Their structure is not precisely determined by strict general rules, which also means it can change and thus constantly adapt itself to new information (Taylor 1995: 53). Indeed, the main interest of categories based on prototypicality and family resemblances is that they can integrate new members (on the periphery or sometimes even in the centre of the category) without disrupting their fundamental structure, just by means of associations and comparisons to other members of the category. Therefore, prototype categories are better adapted to the activity of the human cognitive system, because they “achieve the **flexibility** required by an ever-changing environment” (Taylor 1995: 54).

This explains why the prototypical instances of some categories (like [BEAUTY] for instance) may completely change over time (Taylor 1995: 58). They may also vary spatially, from one culture to another. For example, the two categories [FURNITURE] in English and [MÖBEL] in German refer to the exact same objects, but while the prototypical member is [CHAIR] in English, it is [BETT] ([BED]) in German (Taylor 1995: 56).

In short, prototype theory overcomes many obstacles encountered by the classical approach by adopting a new approach: taking into account the way the cognitive system categorizes and adapting to it, rather than directly imposing its rules on it. Indeed, many constraints that characterized the classical theory have clearly disappeared in prototype theory: there is no set of necessary and sufficient features as conditions for membership, no requirement for strict category boundaries, nor for any separation between linguistic and extra-linguistic reality, since categorization is explicitly said to rely on our experience of the world. Nevertheless, it does not mean that prototype theory is more approximate than the classical theory or carefully avoids its difficulties, quite the contrary. Instead of being based on preconceived frames, it really tries to give an accurate account of cognitive reality in all its complexity. Yet this clear ambition, which is the main strength of prototype theory, is also what brings out its deficiencies, as will be developed below. Additionally, some of the difficulties encountered by the classical theory are still not tackled: for instance, the “problem of ignorance and error” (defined above) remains in prototype theory (Laurence and Margolis 1999, in Evans and Green 2006: 268).

2. Objections to the standard prototype theory

a. The nature of prototypes

One of the main difficulties raised by prototype theory lies in the very meaning one attaches to the word “prototype”. Indeed, from the beginning of this dissertation prototypes have been presented as central members of a category, that is to say as **specific exemplars**. But this first possible way to understand prototypes brings about a certain number of problems.

To begin with, if prototypes are specific exemplars, by definition their representation cannot be abstract. And yet for many categories, if not all, the mental image we draw from the prototype leaves some features of category members unspecified. For instance, it is quite conceivable that the prototype of the category [DOG] is neither male nor female, which is clearly incompatible with the definition of the prototype as a specific exemplar. The problem is even more obvious in the case of categories that are characteristically abstract, like [COWARDICE] or [TALLNESS], since they have no specific exemplar at all, although their members (events or objects) can be considered as more or less prototypical (Taylor 1995:60).

Finally, defining the prototype of a category as a specific exemplar makes it logically impossible to consider this prototype as a category, itself including other members, which is nevertheless very often the case (Taylor 1995:60). For example, the prototype of the category [FURNITURE] is the category [CHAIR], which includes other categories like [KITCHEN CHAIR], [ROCKING CHAIR] or [DENTIST’S CHAIR]. If the basic level [CHAIR] were a specific exemplar of a chair, with specific features, it could not encompass such different members at the subordinate level.

All these reasons point to another, maybe more appropriate definition of the prototype, not as a particular member of a category, but as a **schematic representation** of its conceptual core (Taylor 1995:59).

Although this second definition seems convincing and was adopted by several researchers (including Taylor 1995: 59), it is worth mentioning that in her later writings, Eleanor Rosch tends to reject both definitions: prototypes as specific exemplars and as schematic mental representations. Indeed, while experimental results undeniably reveal prototype effects in the way people make categorization judgements, it does not necessarily

follow that these results should be interpreted as evidence of how categories are represented cognitively, that is to say in their minds (Evans and Green 2006: 269).

This is, among others, the position of George Lakoff (see III), for whom prototype effects should not be directly understood as cognitive representations, but rather as “surface phenomena”, that is to say as mere consequences of the activity of the cognitive system, whose organization is in fact much more complex (Evans and Green 2006: 269).

One proof of this complexity may be that prototype theory is completely unable to account for certain categories, especially non-existent categories (like [US MONARCH]) and very heterogeneous categories (like [OBJECTS THAT WEIGH MORE THAN A GRAM]). For these two special kinds of categories, it is impossible to define a prototype, although they visibly have meaning for any speaker. This problem, identified by Stephen Laurence and Eric Margolis, is called “the **missing prototypes problem**” (Evans and Green 2006: 268).

b. The notion of similarity, or resemblance

The notion of similarity, on which prototype theory is largely based, turns out to be highly problematic for various reasons:

First, similarity is “a graded concept”, which means that things can be more or less similar. Hence the question is: “how different do two things have to be for them to cease to be similar?” (Taylor 1995: 60). For example, cats and dogs share many similarities, and yet we would never say that cats are members of the category [DOG], even very marginal ones (Taylor 1995: 63).

This goes together with another difficulty, which is: “should all features count equally as criteria for similarity?” (Taylor 1995:61). In the case of the category [BIRD], for instance, both ostriches and bats share features with robins (prototypical members of the category), but some of these features (like having a beak, or having feathers) seem to count more for membership than others (like being small, or being able to fly), which may explain the difference of treatment between ostriches and bats. But how, on which basis, do we determine the features that are more important?

Besides, the features which serve as criteria of comparison can prove to be very complex:

- First, they can be graded concepts (like /small/, for instance: hence it is not enough to ask whether bats are small or not in order to know how central they are in the category [BIRD]; what is important is how small they are, in comparison with how small robins are, which is already more difficult to determine precisely).
- Plus, features are neither neutral nor autonomous, but can often influence one another. For instance, if a member of the category [SPOON] possesses the feature /wooden/, its goodness-of-exemplar can still vary depending on whether this feature is associated with the feature /large/ or /small/: in the first case, the member is more likely to be central than in the second case, which suggests that /wooden/ and /large/ have a positive interaction on prototypicality whereas /wooden/ and /small/ do not work well together (Croft and Cruse 2004: 87).
- Not only can features influence one another, but they can also be affected by the category they are related to. A piano, for instance, may well possess the feature /large/ when considered in the category [FURNITURE], but not anymore in relation to other objects, like buildings (Rosch 1978: 41, quoted in Lakoff 1987: 51). This shows well that features or attributes are never completely objective, but “interactional”: they do not exist independently in the world, but are “the result of our interactions as part of our physical and cultural environments given our bodies and our cognitive apparatus” (Lakoff 1987: 51).
- What’s more, the meaning and implications of a feature depend on the context in which it is used. As was said before about the category [GAME], Ludwig Wittgenstein observed that skill at chess is very different from skill at tennis, which makes it difficult to evaluate the similarity of both games on a same criterion that would be /skill/. The reason for this is that [SKILL] is not merely a feature serving for the comparison of several members of a category; it is itself a category, with more central, prototypical skills, and other, more marginal skills. And this is the case for many features, even those which may appear very clear-cut. For instance, the feature [ABILITY TO FLY] in the category [BIRD]: indeed, while some birds cannot fly at all, some others, like chickens, can flap their wings and lift themselves off the ground, although they do not fly as robins fly, so that chickens’ ability to fly is more marginal

than robins' ability to fly (Taylor 1995: 62). This recurrent phenomenon of prototype categories embedded in the definition of other prototype categories (as features) makes the structure of the categorization system extremely complicated. And it seems to be more and more confusing as one goes into further detail. For example, the definition of the category [ABILITY TO FLY], which is one of the features needed to compare the members of the category [BIRD], depends itself on a certain number of features, which are even more complex categories raising questions like: how fast does an object have to move in the air before we can say it flies? what distance does it have to be from the ground? etc. (Taylor 1995: 62).

Here prototype theory is visibly faced with one of its main paradoxes, which is that the **whole** of a category does not simply consist of the sum of its individual **parts**: on the contrary, it is often “perceptually and cognitively simpler” than any of its parts (Taylor 1995: 62).

This crucial part/whole paradox takes on another dimension in the case of complex categories (that is to say compounds), in which it is called the “**problem of compositionality**” (Fodor and Lepore 1996, in Evans and Green 2006: 268). The example given most often to illustrate this problem is that of the complex category [PET FISH], which is a whole composed of the categories [PET] and [FISH], and thus should quite logically consist of the sum or synthesis of these two categories. But this is far from being the case. Indeed, while the prototype of [FISH] is grey and medium-sized, and the prototype of [PET] is fluffy and affectionate, the prototype of [PET FISH] is rather small and bright-coloured (Evans and Green 2006: 268). This shows well that, when a category is composed of other categories, the characteristics, or structure, of the latter are not automatically included into the former. In fact, for many compounds, “the meaning of the whole cannot be predicted from the meanings of the parts and the way they are put together” (Lakoff 1987: 147).

3. Attempts to reconcile prototype theory with the classical approach

a. Schemas

Given the complexity of categorization by prototype, some researchers tried to re-establish the classical principle according to which in every category there should be something common to all members. For example, Ronald Langacker introduced “**schemas**” as a possible alternative to category prototypes, which he defines as follows: “A prototype is a

typical instance of a category, and other elements are assimilated to the category on the basis of their perceived resemblance to the prototype; there are degrees of membership based on degrees of similarity” (Langacker 1987: 371, quoted in Taylor 1995: 66). This sentence encompasses many of the problems that characterize prototypes (the fact that they are defined as specific exemplars of a category, the notion of similarity, etc). The definition of schemas that Langacker suggests is meant to settle such problems: “A schema, by contrast, is an abstract characterization that is fully compatible with all the members of the category it defines (so membership is not a matter of degree)” (Langacker 1987: 371, quoted in Taylor 1995: 66). Here again we find several characteristics of the classical theory, especially the fact that all the members of a category have something in common which defines this category (although it is not a set of features, as in the classical approach, but an abstract representation) and that membership has only two values (either member or not member). But categorization by schema remains very close to prototype theory, from which it keeps the advantages while leaving out its shortcomings.

For instance, the schema of the category [TREE] is “a tall, central trunk with branches”: an image which corresponds to all members of the category. For Langacker, speakers acquire schemas progressively, as they encounter new members of the category considered. If the first trees seen by a language learner are oaks and maples, his representation of trees (that is to say the schema) will be “large, deciduous leafed plants”; then, if he sees pine trees, this representation will evolve in order to be compatible with the former members plus the new members, which will give rise to a second schema (this time without the “deciduous leafed” characterization), and so on (Taylor 1995: 66).

This convincing theory, which settles many difficulties mentioned before about categorization by prototype, also has its own weaknesses. Indeed, “for many categories of natural language, it is just not possible to abstract a schema which is compatible with *all* the members of the category”, and only with them (Taylor 1995: 67). Schemas are indeed used in some cases, but only by “more sophisticated, reflective language users” (Taylor 1995: 68) who are cognitively able to extract from increasingly diverse members of a category an abstract representation of what they have in common. Thus categorization by schema exists but does not replace categorization by prototype, which always precedes it.

b. Core and identification procedure

Another attempt to “save” the classical theory while still taking into account the advances of prototype theory was provided by Osherson and Smith (1981, in Lakoff 1987: 142). For them, every category has a **core** on the one hand, and an **identification procedure** on the other hand. The core is the essential definition of a category; it tells what the category really is. By contrast, the identification procedure answers practical considerations: it is a sort of short cut used in everyday situations to make quick decisions about membership, when an entity needs to be immediately identified by the mind (Osherson and Smith 1981, in Lakoff 1987: 143). This distinction offers a perfect compromise between the classical theory (which determines the core) and prototype theory (which determines the identification procedure). The example given by Osherson and Smith is the category [WOMAN], whose core “contain[s] information about the presence of a reproductive system” while its identification procedure deals with “body shape, hair length and voice pitch” (Osherson and Smith 1981: 57, quoted in Taylor 1995: 69). The difference between core definition and identification procedures also explains why most people judge that 3 is a better example than 447 in the category [ODD NUMBER] although, essentially, a number is either even or odd and no number is odder than the others. Indeed, the number 3 is needed more frequently in everyday life, to count groupings of objects for instance, which is why it is more rapidly identified, but this does not affect the core of the category [ODD NUMBER], whose essence remains the same. However, although this “hybrid” theory may appear quite convincing, it is worth remembering that the combination of two theories of categorization does not automatically make up for their respective weaknesses. For instance, the fact that for many concepts it is impossible to form a satisfying core definition is a problem inherited from the classical theory which still remains (Croft and Cruse 2004: 88).

c. Expert and folk categories

The distinction between the core and the identification procedure of a category has some common points with another distinction, between **expert categories** and **folk categories**. As their name suggest, expert categories are intentionally created and used by experts in a given domain in order to categorize objects with exactitude: hence such categories are classically defined (by a set of necessary and sufficient features, which alone can constitute clear conditions for membership). Folk categories, on the contrary, are used in everyday situations which involve interactions between speakers and their environment, and thus are prototypically organized (Taylor 1995: 72). [PHONEME] and [ALLOPHONE] are

examples of expert categories, while [CHAIR] and [CUP] are folk categories. Nevertheless, most categories have both an expert definition and a folk definition: for instance [WATER] has a very precise scientific definition, which deals with what water is from an essential point of view (H_2O), but in everyday life the knowledge of this expert definition is not needed to identify water and is thus most often substituted by water's folk definition ("clear, tasteless liquid"), which shows prototype effects (Taylor 1995: 73). Thus, although the distinction between expert and folk characterization is helpful in many cases, it also raises the question of where exactly to draw the limit between the two, since they are often interdependent on each other. For instance, the way speakers identify and characterize dogs in everyday life is not necessarily independent of their expert knowledge about them, and vice versa.

In the case of animal species, the notions of expert and folk definitions are particularly interesting. For the species [FISH] for instance, it is tempting to distinguish, on the one hand, a very clear expert definition which involves necessary and sufficient criteria like the presence of gills and a characteristic anatomy and, on the other hand, a folk definition about an animal with scales and fins living under water. Nevertheless, strange as it may appear, animal species cannot form satisfying classical categories, even in the expert domain. Indeed, a species in nature "does not have a uniform internal structure, with all members sharing a given set of defining properties uniformly" (Lakoff 1987: 187). This constant variation of animal species is linked to many different factors and has multiple dimensions. Not only does it occur in time (due to natural evolution), but also in space (due to the adaptation to a particular environment, for instance) (Lakoff 1987: 189). This implies that the limit between one species and another is not definite, but rather a matter of degree. Therefore, species naturally have fuzzy boundaries and show prototype effects (Lakoff 1987: 189). This is why even biologists do not agree on a single expert definition. They are divided into two opposed groups: the pheneticists, who consider "overall similarity in form, function and biological role" as important criteria, and the cladists, who look at "shared derived characters", from the point of view of evolution (Lakoff 1987: 119). Indeed, overall similarity does not always coincide with evolutionary branching. Stephen Jay Gould, in "What, If Anything, Is a Zebra?" (1983, quoted in Lakoff 1987: 119), studies the three currently existing species of zebra: Burchell's zebra, the mountain zebra, and Grevey's zebra. The three of them share many similarities, which is why they form a biological category according to pheneticists. But while Burchell's zebra and Grevey's zebra are part of the same genealogical unit, this is not the case for the mountain zebra, which is related to the horse, and hence cladists deny that they form a

biological category (Lakoff 1987: 119). In fact, each method of biological categorization has its own criteria and neither of them is more correct or closer to nature than the other: this shows that, even in expert domains, there is no objectively right way to categorize (Lakoff 1987: 260), because categorization is fundamentally linked to humans' point of view and bodily experience of the world. This idea, which is already present in prototype theory, will be at the centre of the theory of idealized cognitive models developed by George Lakoff.

III. Radial categories and the theory of idealized cognitive models

While prototype theory is clearly distinct from the classical theory and opposed to it in some respects, the theory of idealized cognitive models, which was put forward by Lakoff in the 1980s, does not call into question the findings and advances of prototype theory. More than a whole new theory, it is a complement and a clarification which attempts to solve some of the difficulties faced by prototype theory.

1. Idealized cognitive models

Idealized cognitive models (or ICMs) are **mental structures** which help us organize our thoughts and categorize. For instance, in order to understand the word "Tuesday", speakers generally have in their minds the mental representation of a week, as a linear sequence divided into seven equal parts, each part being called a day, and the second one of them being called Tuesday: this sort of mental frame, or background, which is learnt on the basis of repeated experience and is absolutely necessary to understand the category [TUESDAY], is an example for an idealized cognitive model (Lakoff 1987: 68). It is called "idealized" because it does not exist objectively in the world, but was culturally created.

The existence of ICMs explains why we can instantly learn or create new prototype categories: for instance, the category [WHAT TO GET FOR A BIRTHDAY PRESENT] or the category [WHAT TO TAKE FROM ONE'S HOME DURING A FIRE], which are formed on the basis of pre-existing ICMs (in the case of the latter, for example, "the sentimental and monetary value" we attach to different objects, but also in which room each of them is, "the amount of time likely to be available" etc.) (Evans and Green 2006: 270).

ICMs can give rise to prototype effects in various ways:

a. Matches and mismatches between models

This is the “simplest” way prototype effects can emerge from ICMs (Lakoff 1987: 69). It concerns among others the category [BACHELOR], which Lakoff takes as an example.

The category [BACHELOR] is defined and understood in relation to an ICM, which contains information about a monogamous society, the institution of marriage, a typical marriageable age etc. On the other hand, the category [POPE] is defined and understood with respect to another ICM, which contains information about the Catholic clergy and the fact that they cannot marry. Here, there is a visible mismatch between both ICMs, which explains why the Pope is not a prototypical member, but rather a very marginal instance of the category [BACHELOR] (Evans and Green 2006: 270). Therefore, the goodness-of-exemplar of a category member depends on the degree of matching between the ICM against which it is understood, and the ICM against which the category is defined.

b. Cluster models

They constitute the second type of ICMs which give rise to prototype effects. As its name indicates, a cluster model is a complex ICM composed of several ICMs (Evans and Green 2006: 271).

The example chosen by Lakoff to illustrate the structure of cluster models is the complex ICM against which the category [MOTHER] is understood. In fact, it is a combination of five ICMs: the birth model (the woman who gives birth to a child), the genetic model (the woman who “contributes the genetic material” of a child), the nurturance model (the woman who nurtures and raises a child), the marital model (the wife of the father) and finally the genealogical model (the woman that is one level up in the family tree) (Lakoff 1987: 74). Of course, there were not five ICMs right from the beginning, “but because of the complexities of modern life, the models in the cluster have come to diverge more and more” (Lakoff 1987: 75) and the cluster has gradually been divided up in order to adapt the variety of situations that one is likely to be faced with. Therefore, none of these five ICMs describes by itself what a mother is, but depending on the context, speakers will favour one model or another.

c. Metonymic models

They are the third possible source of prototype effects and are defined as “cases where a part (a subcategory or member or submodel) stands for the whole category” (Lakoff 1987: 79).

This phenomenon can occur in seven different situations, in which the part standing for the whole can be:

- a social stereotype (like a housewife-mother for [MOTHER])
- a typical example (like a robin for [BIRD])
- an ideal (like a “public-spirited, altruistic, hard-working” person for [POLITICIAN])
- a paragon (that is to say an “individual category member that represents an ideal”, like David Beckham for [FOOTBALL PLAYER])
- a generator (like the natural numbers from 1 to 9, which combine in order to give all the other numbers of the category [NATURAL NUMBERS])

(Evans and Green 2006: 273-274)

- a submodel: for instance, if a speaker needs to evaluate the size of a number, he will use the subcategory of powers of ten (ten, a hundred, a thousand etc.) in order to compare
- a salient example: if a speaker does not know any vegetarians except one of his friends, he will use him as a salient example

(Lakoff 1987: 89)

2. Radial categories

a. Definition

In the theory of idealized cognitive models, radial categories constitute the fourth, but also the most complex and “most radical” source of prototype phenomena effects (Lakoff 1987: 153).

A radial category is composed of several subcategories organized in a circle. At the centre of the circle is the **central subcategory**, in which a cluster of cognitive models converge. This central subcategory is connected, by the radius of the circle, to **noncentral extensions** which are all “variants” or “deviations” from the central subcategory: each

extension is understood against one or several cognitive models present in the central cluster, but not all.

In the case of the category [MOTHER], which Lakoff takes for example, the central subcategory is the one that combines all the idealized cognitive models mentioned before: the birth model, the genetic model, the nurturance model, the marital model and the genealogical model. The extensions are, for instance, [STEPMOTHER] (who “didn’t give birth or supply the genes”, but “is currently married to the father”) or [SURROGATE MOTHER] (who “has contracted to give birth and that’s all”; “she may or may not have provided the genes, and she is not married to the father and is not obliged to provide nurturance”) (Lakoff 1987: 83).

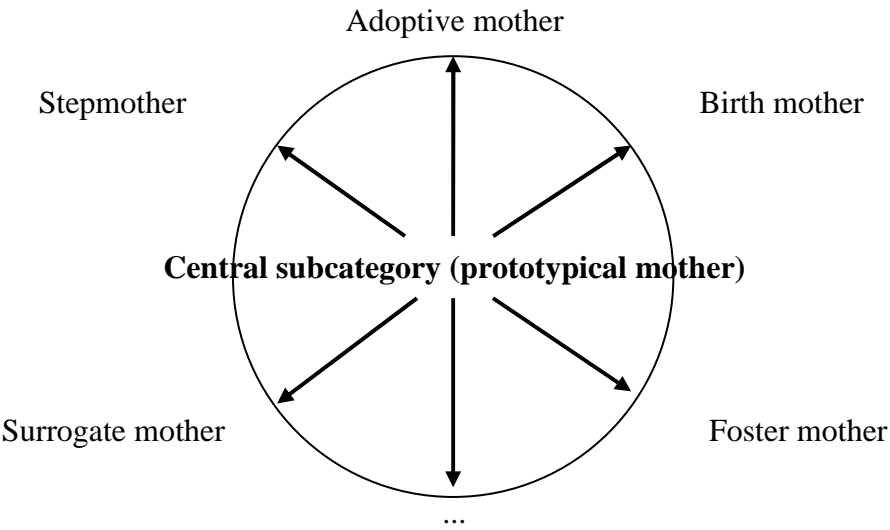


Figure 3: Radial network for the category [MOTHER] (Evans and Green 2006: 276)

The noncentral extensions are neither completely random, nor directly deducible from the central subcategory by general rules. On the one hand, they are products of a particular culture and of its history, so that they are generally learned one by one (Lakoff 1987: 84): [SURROGATE MOTHER], for instance, did not exist until 20th century medical advances made surrogacy possible. On the other hand, extensions are still **motivated** by the central model which, while it can never predict them exactly, defines at least the range of possible extensions as well as the possible relations between them and the centre (Lakoff 1987: 91).

b. Example

Some categories, whose structure may appear as completely opaque on the face of it, can become clear thanks to this notion of radial category. One of the best examples for this is certainly the one developed by George Lakoff on Dyrbal, an Australian aboriginal language

which classifies everything in the world with four words: “bayi”, “balan”, “balam” and “bala” (Lakoff 1987: 92).

The category [BAYI] includes:

- men
- several animals like possums, bats, most snakes, most fishes, some birds and most insects
- the moon, storms, rainbows
- several weapons like boomerangs and some spears
- ...

By contrast, the category [BALAN] is used for:

- women
- several animals like dogs, some snakes, some fishes, most birds, fireflies, scorpions, crickets and the hairy mary grub
- the sun and stars
- fire and anything connected to it
- water and anything connected to it
- some trees
- several weapons like shields and some spears
- ...

As for the category [BALAM], it contains:

- all edible fruit
- the plants that bear them
- honey, cigarettes, wine, cake
- ...

Finally, the category [BALA] includes:

- parts of the body, meat
- bees
- most trees, grass, mud, stones
- noises and language

– ...

(Category description by R.M.W. Dixon 1982, in Lakoff 1987 : 92).

To any person who does not speak Dyirbal, this categorization system may seem strange and illogical. The classical theory cannot account for it, since there is obviously no common property shared by all the members of each category. As for family resemblances, which characterize prototype categories, they are not directly visible.

To some extent, it may be possible to distinguish a form of coherence in each category: males and animals in [BAYI], females, water, fire and fighting in [BALAN], nonflesh food in [BALAM] and all the rest in [BALA] (Lakoff 1987: 93). But then, exceptions are so numerous and diverse that no real rule can be drawn. For example, there are as many animals in the category [BALAN] as in the category [BAYI], and these are not even different animals, since snakes and fishes, for instance, are divided between both categories; there are some animals in the category [BALA] too.

However, contrary to appearances, three of the four categories ([BAYI], [BALAN] and [BALAM]) are perfectly regular radial categories. Each one of them has a central subcategory (men in [BAYI], women in [BALAN] and edible plants in [BALAM]), from which are rationally derived noncentral extensions (Lakoff 1987: 102). They all follow the theory of ICMs, plus the following principles:

- “If there is a basic domain of experience associated with A, then it is natural for entities in that domain to be in the same category” (Dixon 1982, quoted in Lakoff 1987: 93). For example, fishes (being animals) are members of the category [BAYI]: since fishing implements are part of the same “domain of experience”, they are included in the category [BAYI] too, although they may be expected to be in the category [BALA] (Lakoff 1987: 93). This principle illustrates one of George Lakoff’s main theses, which is that experience and human interaction with the environment are capital in the structure of a categorization system (Lakoff 1987: 112).
- “If some noun has characteristic X [...] but is, through belief or myth, connected with characteristic Y, then generally it will belong to the class corresponding to Y and not to that corresponding to X.” (Dixon 1982, quoted in Lakoff 1987: 94) For instance, birds are animals and thus should normally be members of the category [BAYI]; but since in the local myths they are believed to be the spirits of dead women, and since

[WOMAN] is the central subcategory of the category [BALAN], birds are logically members of this category. As for rainbows, they are male divinities, hence they are members of the category [BAYI], whose centre is the subcategory [MAN]. (Lakoff 1987: 93). This principle shows well how radial categories are culturally defined and thus require a specific knowledge of cultural elements (here, myths, which visibly constitute ICMs) in order to be understood (Lakoff 1987: 96).

- “If a subset of nouns has some particular important property that the rest of the set does not have, then the members of the subset may be assigned to a different class from the rest of the set to “mark” this property; the important property is most often ‘harmfulness’.” (Dixon 1982, quoted in Lakoff 1987: 94) For example, fishes in general are members of the category [BAYI] but the stone fish and gar fish are harmful, therefore they are members of the category [BALAN] (Lakoff 1987: 94).

In Dyirbal, the categorization of each entity (or subcategory) obeys at least one of these three basic principles. Nevertheless, it is not enough to directly apply these principles, as if they were general rules, in order to determine the structure of the categories. For example, fishes are members of the category [BAYI] and they live in water, so one may say that water and fishes are part of the same domain of experience and that water should therefore be included in the same category as fishes, which is nevertheless not the case. This confirms another characteristic of radial categories mentioned before, which is that the extensions of a category cannot be strictly inferred or predicted, but are motivated (Lakoff 1987: 96).

This motivated relation from the centre of a category to each one of its extensions is not always direct: instead, it takes the form of a chain, which is often made of several links (Lakoff 1987: 95).

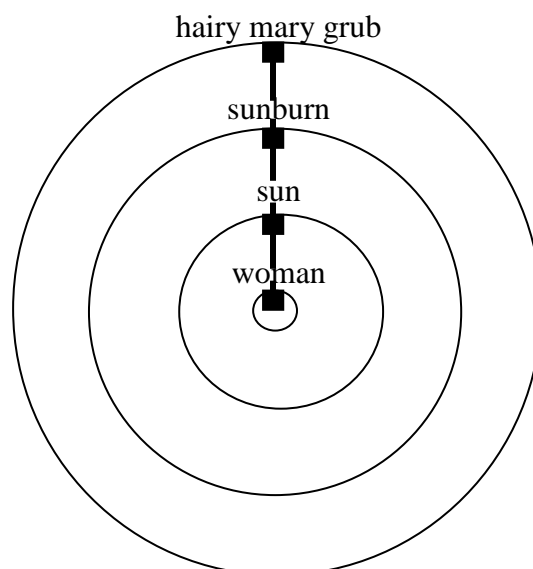


Figure 4: Example for chaining in the Dyirbal category [BALAN]

For instance, in the category [BALAN]: the subcategory [SUN] is connected to the central subcategory [WOMAN] because the sun is a female mythical figure in Dyirbal mythology. Then, the subcategory [SUNBURN] is connected to the subcategory [SUN] because sunburns are caused by the sun. Finally, the hairy mary grub (a small animal) is connected to the subcategory [SUNBURN] because its sting hurts like sunburn (Lakoff 1987: 95). This example shows that ICMs can be metonymic (the sting of the hairy mary grub stands for the grub itself) or metaphoric (the sting of the hairy mary grub is metaphorically perceived as a sunburn) (Lakoff 1987: 114). They can also be propositional (when they “specify elements, their properties, and the relations holding among them”) or image-schematic (when they “specify schematic images”, for instance the image of a “long, thin object” for [CANDLE]): these are the four possible “types” of ICMs (Lakoff 1987: 113).

3. “Addressing the problems with prototype theory” (Evans and Green 2006: 278)

The first element of progress in the theory of ICMs is that it is not another attempt to put together the classical theory and prototype theory, and thus it avoids the traps that such an ambition entails. At the same time, it manages to give a precise account of the apparent paradox represented by the categories which are classical but nevertheless show prototype effects (like the category [ODD NUMBER]). Indeed, as said before, the natural numbers from 1 to 9 are generators: this implies that they have a privileged place in the category [NUMBER] which they metonymically stand for. Within this set of natural numbers from 1 to 9, there are two submodels, corresponding to [EVEN NUMBER] and [ODD NUMBER]. Therefore, the generators included in the subcategory [ODD NUMBER] (that is to say 1, 3, 5, 7 and 9) metonymically stand for the entire subcategory [ODD NUMBER], which explains why they are more prototypical than other odd numbers (like 477). In fact, it is the very nature of ICMs which explains why a classical theory still has prototype effects (Evans and Green 2006: 278).

As for the “problem of ignorance and error” which, as was said before, consists in the possibility of “possess[ing] a concept while not knowing or being mistaken about its properties”, it simply does not come up in the theory of ICMs, since contrary to prototype

theory, it is not based on the assumption that prototype effects are equivalent to cognitive representations (Evans and Green 2006: 278). As mentioned before, according to Lakoff, prototype effects are not mental structures themselves but mere “surface phenomena” which are understood against a large variety of preexisting ICMs. The “problem of missing prototypes” is avoided in the same way. Indeed, categories like [US MONARCH] or [OBJECTS THAT WEIGH MORE THAN A GRAM] are created against stable preexisting ICMs, exactly like the category [WHAT TO TAKE FROM ONE’S HOME DURING A FIRE]: this is why they can be conceptualized and understood, although they do not show any prototype effects (Evans and Green 2006: 279).

Finally, the part/whole paradox and especially the problem of compositionality are settled by the theory of ICMs, according to which the category [PET FISH] is not directly a composite of the meanings of [PET] and [FISH], but has a completely independent structure. Indeed, ICMs have “experiential basis” (that is to say they have been acquired by repeated experience): this is why [PET FISH] is understood against a specific ICM which came up by repeated experience of pet fish and which is therefore completely distinct from the ICMs related to the categories [PET] and [FISH].

Therefore, by assuming that prototype categories do not directly reflect the organization of the mind, but stand out against a multiplicity of mental backgrounds defined as cultural creations and acquired by the means of constant interactions with the extra-linguistic world, the theory of ICMs enriches prototype theory with another dimension and at the same time solves most of the difficulties it is faced with.

Chapter 2

Continuing on from the theoretical introduction that has just been provided, the present chapter intends to put it into practice. After presenting the methodology adopted and defining the linguistic corpus which constitutes the basis of the analysis, it will attempt to give an account of the categorization of nouns denoting more than one species in English, in comparison to French.

I. Methodology and corpus presentation

1. Corpus

	English nouns denoting more than one species	Possible French translations ¹
Nouns denoting animals in general, without regard to sex or age	<ul style="list-style-type: none"> ▪ “animal” ▪ “creature” ▪ “beast” ▪ “pet” ▪ “deer” ▪ “bug” 	<ul style="list-style-type: none"> ▪ “animal” ▪ “créature” ▪ “bête” ▪ “animal domestique” / “animal de compagnie” ▪ “cervidé” ▪ “insecte”
Nouns denoting either male or female animals	<ul style="list-style-type: none"> ▪ “cock” & “hen” ▪ “bull” & “cow” ▪ “dog” & “bitch” ▪ “tom” ▪ “boar” & “sow” ▪ “jack” & “jenny” ▪ “jack” & “jill” / “gill” ▪ “buck” & “doe” ▪ “stag” & “hind” ▪ “stallion” & “mare” 	<ul style="list-style-type: none"> ▪ “coq” & “poule” ▪ “taureau” & “vache” ▪ “chien” & “chienne” ▪ “chat” / “matou” ▪ “verrat” / “porc” & “truie” ▪ “âne” & “ânesse” ▪ “daim” & “daine” ▪ “cerf” & “biche” ▪ “cerf” & “biche” ▪ “étalon” & “jument”

¹ The presentation of this corpus in the form of a double-entry table should not wrongly suggest that the nouns listed in this column are the French equivalents, or counterparts, of the English nouns listed on the left; their extension is by no means the same. Instead, they are approximate translations which may only be appropriate in some particular contexts, to refer to a particular referent among the wide variety of animals that each English noun can denote. I mentioned them so that they can serve as examples, as starting points to establish the comparison between both languages, which will be studied later for every noun taken individually.

	<ul style="list-style-type: none"> ▪ “sire” & “dam” 	<ul style="list-style-type: none"> ▪ “étalon” & “jument”
Nouns denoting young animals (as opposed to adults)	<ul style="list-style-type: none"> ▪ “chick” ▪ “calf” ▪ “pup” / “puppy”, “whelp” ▪ “kit” / “kitten” ▪ “foal”, “colt” ▪ “cub” ▪ “joey” ▪ “hatchling” 	<ul style="list-style-type: none"> ▪ “poussin” ▪ “veau” ▪ “chiot” ▪ “chaton” ▪ “poulain” ▪ “renardeau” ▪ “bébé kangourou” ▪ “oisillon”

Table 1: Corpus of nouns denoting more than one species

Given the diversity of animal species and of the nouns used to refer to them, this corpus is most probably not exhaustive. It rather intends to give a general survey of the most common English nouns denoting more than one species, as a characteristic of this language in comparison to French.

The first nouns to be included in this corpus were nouns which directly appeared to have different referents in English and in French, like “creature”, “beast”, “cow”, “cock”... Looking up the definitions of these words in the *Oxford English Dictionary* and the *Grand Robert* led me to consider other terms that were mentioned in these definitions, especially those in the same family (“hen” and “chick” were added to “cock”, “bull” and “calf” to “cow” etc.). Internet research, especially the Wikipedia article “List of animal names”, also helped me to enrich the corpus, although I am aware that it is not as reliable a source as the *Oxford English Dictionary*, which is why I considered it cautiously.

As the corpus was formed, the question very soon came up whether to include or not nouns denoting biological classes, orders, families and genres, that is to say groups that are higher than species in the taxonomical hierarchy: for instance, “bird”, “reptile”, “mammal” etc. I chose to exclude them for two reasons:

- First, if they denote more than one species, it is mainly because of the very organizational logic that is inherent to the taxonomical hierarchy. Indeed, in its pyramidal structure, the categories situated in the lowest levels are necessarily more numerous than those at the top, which is why, by definition, several species are included in each one of the groups situated one level higher. In most cases, it follows that their meanings and referents are very similar in English and in French, which

lowers their interest for this study. For example, here are the English and French definitions of the word “bird”/ “oiseau”:

<i>OED</i> 2013, entry “bird”	<i>Grand Robert</i> 2013, entry “oiseau”
“Any feathered <u>vertebrate animal</u> [1]: a member of the second class (Aves) of the great Vertebrate group, the species of which are [...] distinguished by their <u>warm blood</u> [2], <u>feathers</u> [3], and <u>adaptation of the fore limbs as wings</u> [4], with which <u>most species fly in the air</u> [5]”	“ <u>Animal (vertébrés</u> [1] <u>tétrapodes)</u> à <u>sang chaud</u> [2], <u>au corps recouvert de plumes</u> [3], <u>dont les membres antérieurs sont des ailes</u> [4], les membres postérieurs des pattes, dont la tête est munie d'un bec corné dépourvu de dents, <u>et qui est, en général, adapté au vol</u> [5]”

Table 2: Definitions of "bird" and "oiseau"

It turns out that the definitional elements (which I underlined and numbered from 1 to 5) are not only similar from one language to the other, but also listed in a similar order, which suggests that the meaning of “bird” in English is particularly close to the meaning of “oiseau” in French.

- Second, nouns denoting wider groups of species are extremely numerous and diverse, which makes them difficult to compile and study entirely. A possible solution may have been to leave out nouns that are used in the scientific sphere, and keep only nouns of everyday use. This is the well-known distinction, developed in the first chapter, between expert and folk categories. But as explained before, the limit between the two is not always clear. Indeed, many animal nouns have both an expert definition and a folk definition, which by the way are not necessarily independent of each other. Besides, while some nouns can clearly be distinguished as scientific (“arthropod”, for example), some others are less easy to pinpoint. Most often, it seems that the very concepts of “folk category” and “expert category” are prototype categories, showing degrees of membership. For instance, if “bird” is assumed to be a folk category and included in the corpus, why not “insect”, and if “insect” is included, why not “reptile”, then “amphibian” etc.? Furthermore, as far as biological species are concerned, Lakoff [1987: 189] emphasized the fact that expert definitions cannot be totally objective, and therefore always depend on a particular point of view on the world: to this extent, they are not that different from folk categories.

There are nevertheless a few exceptions in the corpus, that is to say nouns that I chose to include although they denote levels higher than species in the taxonomical hierarchy. These exceptions, “animal” (/“animal”) and “deer” (/“cervidé”), both have a special interest for this study, especially in terms of category organization and of comparison between English and French.

Other nouns I excluded from this corpus were “male”, “female”, “baby” and “infant”. Indeed, although they can refer to more than one species and therefore meet the criteria to enter the corpus, they are used for nearly all animals and are not restricted to them (being used for humans as well). Likewise, I decided to leave out nouns like “queen” and “worker” (which can refer to bees, ants and other species of insects) because they mainly point to the social role of these insects in their habitat, more than to the animals themselves, and are metaphorical translations of human social organization in the animal world.

2. Methodology

The purpose of my research was to establish precisely, for each noun in the corpus, which animal species it can denote, in order to outline the network formed by the members of the category and estimate its delimitations. I also intended to determine the nature of the category (classical, prototype category or other) and find out whether there are members that are more central than others, and which ones. Whenever it was possible, I considered nouns in relation to one another, and paid special attention to whether a form of coherence can be observed in the potential referents of several nouns belonging to a same family (whether “cow”, “bull” and “calf” all denote the same animal species or not, for instance).

Looking up all the nouns in the dictionary constituted the first step in the research process. My main sources were the *Oxford English Dictionary* (2013) and the *Grand Robert de la Langue française* (2013), because they are reliable and recognized references in the two languages. I copied each article, analyzed it in detail: the words used, the order in which definitions appear (a precious indication as to which members of the category are more central than others), the examples given... Then I transcribed the most salient aspects of the English and French definitions in tables, which enabled me to confront them directly and clearly. This provided me with a precise idea of the general meaning of each category, and of most of its members, from those which visibly appeared as central to the more marginal, or rarest ones. Every time I came across a new noun (in the body of the definitions themselves or

on the Internet) which might denote several species, I looked it up in the *Oxford English Dictionary* in order to confirm this hypothesis. Nevertheless, in some (rare) cases, the *Oxford English Dictionary* turned out not to be detailed enough: for instance, it defines “sow” only as “the female of the swine” but mentions no other species (*OED* 2013, entry “sow”), although in the Internet “sow” was visibly used for other animals (especially the bear). In such cases, I consulted the online Free Dictionary (2013) as a complement to the *Oxford English Dictionary*: indeed, although its definitions are not as precise, developed or reliable as the *Oxford English Dictionary*, it provides another point of view, which proved to be useful.

Once I had established the meaning of each noun and a list of all the animals it could refer to, the next step was to verify whether this noun is actually used to refer to these various animals, and how frequently. This implied an Internet search, using either the Corpus of Contemporary American English (COCA) or Google. The Corpus of Contemporary American English had the advantage of including a great variety of texts from verified sources by native English speakers. However, the first search attempts were not very conclusive: “buck”, for instance, generates a lot of waste (contexts which have nothing to do with animals, for instance when “Buck” is a proper noun) and the relevant results obtained just point to the deer, and not to any other species (COCA, search “buck”, May 2013). Besides, there are a number of restrictions inherent to the system: for instance, if one enters two words in the search bar (like “buck doe”), the Corpus of Contemporary American English only retains the contexts in which these two words are separated by 9 words or less, which is not much.

Google, on the other hand, is not as restricted, which is why I thought it to be more appropriate for my study (especially for rare animals, which may not necessarily be found in a corpus like the COCA). However, Google has other, not insignificant, disadvantages, like the impossibility to know exactly whether the numerous texts found are written by true English speakers or not. This is why I adopted as rigorous a method as possible. First of all, I always used advanced search, indicating as criteria: “affiner la recherche par langue : Anglais” and “affiner la recherche par pays: Royaume-Uni”. Unfortunately, it was technically impossible to select several countries (United Kingdom, United States and Australia, for instance), and I lacked time to search each term and each expression three times while changing the selected country: it would probably have given a more complete insight of the way English speakers use animal nouns.

After I obtained a list of results, I copied the first thirty of them (commercial ads excluded). I examined each one of them and considered only those with a website address ending with “.uk” or whose provenance I could determine precisely (for instance: Google, search “animal”, February 2013, second result from a Cambridge University website), and I left out all the rest. In this way the author was more likely to be a native English speaker, although it can never be asserted with complete certainty. Besides, when I was faced with double results (that is to say, when the exact same context, on the exact same webpage, was mentioned twice in the list of results), I chose to discard the second occurrence, so that no result counts more than the others.

Then, I carefully made notes of all results: the animal species that the searched noun referred to, but also the type of context and website. I first searched nouns alone, as I had found them in the dictionary (“animal”, “cow”, “cub”, etc.). When searches were not conclusive (for instance “cock”, which mainly pointed to names of inns and pubs), I also noted the results and, when possible, attempted other searches (for instance “cock bird”, which gave better results).

This method generally proved effective and I intended to apply it to all my searches, but given the great number of species that the nouns of the corpus can refer to, and the diversity of ways these nouns can be used, it appeared necessary to adapt it. For instance, in order to study exactly how “cock” is used to refer to sparrows, and whether nouns of the same family are used in the same way, six different searches would ideally be necessary: “sparrow”+“the cock”, “sparrow”+“the hen” and “sparrow”+“the chick” (where “cock” replaces “male sparrow”), but also “cock sparrow”, “hen sparrow”, “chick sparrow” (where “cock” is employed as a modifier, and only replaces “male”). Furthermore, when the noun studied is used together with another noun denoting a specific animal species, it may be placed either before (“cock sparrow”) or after it (“lion cub”); sometimes, both can be found (for example, “cow moose” and “moose cow” respectively give 24,800 and 15,100 results, March 2013). This, as well as the possible variations of spelling (for instance “jill”/“gill”), increases the number of searches. For all these reasons, I had to shorten the treatment of many search results, analyzing them more generally rather than one by one, or just retaining their number (although this kind of information is not necessarily significant and should therefore be considered carefully: for instance, rarer animals necessarily give fewer results). In any case, when I searched expressions or compounds I was always careful to use inverted commas (for instance “guinea hen”), and when I entered several words or expressions at a time, I

separated them with the sign “+” (for instance “guinea hen”+”the cock”), in order to be as coherent as possible.

II. Nouns denoting animal species in general (without regard to sex or age)

1. “Animal”

a. Definition

The first definition of the word “animal” is the scientific, biological definition: it is similar in both languages.

OED 2012, entry “animal”	Grand Robert 2012, entry “animal”
<p>“A living organism which feeds on organic matter, typically having specialized sense organs and a nervous system and able to respond rapidly to stimuli ; any living creature, including man. Animals are generally distinguished from plants by being unable to synthesize organic molecules from inorganic ones, so that they have to feed on plants or on other animals. They are typically able to move about, though this ability is sometimes restricted to a particular stage in their life cycle. They are eucaryotic and lack rigid cell walls. Animals constituted one of the three Linnaean kingdoms of natural objects, along with plants and minerals, and traditionally included protozoans. In current technical use animals are often defined as multicellular heterotrophs, and thus they now usually include sponges but exclude protozoans. Cf. <u>Animalia n.</u> The great majority of animals are invertebrates, of which there are some thirty phyla; the vertebrates constitute but a single subphylum.”</p>	<p>“Biol. Être vivant formé d'une ou de plusieurs cellules possédant des caractères constants, et qui, outre les caractères généraux de tout être vivant (croissance, métabolisme, reproduction), possède des caractéristiques spécifiques, surtout sous ses formes pluricellulaires : sensibilité, motilité, hétérotrophie.</p> <p>REM. 1. Dans l'usage, le subst. <i>animal</i> s'emploie surtout en parlant des organismes pluricellulaires complexes (→ Métazoaires) [...]</p> <p>1 On ne peut donner dans l'état actuel de la science une définition qui distingue en quelques mots l'animal du végétal et l'on peut même se demander s'il y aurait lieu de maintenir cette distinction pour les formes organiques les plus élémentaires.</p> <p>Lalande, Voc. de la philosophie, art. <i>Animal</i>.</p> <p>2. Même dans l'usage scientifique, <i>animal</i> exclut souvent l'espèce humaine : les traités de zoologie n'incluent pas l'anatomie et la physiologie humaines.”</p>

Table 3: Definitions of "animal"

The specialized vocabulary (“eucaryotic”, “protozoans”, “multicellular heterotrophs”, “subphylum” etc.) as well as the reference to a biologist (Linnaeus) suggests that this first definition is an expert definition. Indeed, [ANIMAL] appears here as a category specifically created and circumscribed by biologists in order to classify things in nature. A living being is recognized a member of the category [ANIMAL] only if it possesses a certain number of biological attributes detailed above: thus, plants are clearly outside the category, while humans are visibly inside. This makes [ANIMAL] a classical category, with a set of necessary and sufficient features, definite boundaries and only two degrees of membership (member / not member).

However, the expert category [ANIMAL] is a very good example of what Lakoff showed (1987: 119), which is that most of the time there is no single expert definition which meets general consensus among biologists. For instance, while Linnaeus includes protozoans in the category [ANIMAL], current biologists “include sponges but exclude protozoans”. In fact, while some living beings are clearly and immediately recognized as members of the category (especially the most complex ones, for example birds, tigers, dogs...), it is less certain for some others. The French definition also indicates the fuzziness of the boundary between the category [ANIMAL] and the category [PLANT]. Even the human being, who clearly meets all the criteria to be a member of the category [ANIMAL], is sometimes not categorized as such by scientists themselves. All this indicates that [ANIMAL] is actually not a classical category, even for experts.

The second definition, which is again very similar in English and in French, goes as follows:

<i>OED 2012, entry “animal”</i>	<i>Grand Robert 2012, entry “animal”</i>
“In ordinary or non-technical use: any such living organism other than a human being. Freq. applied specifically to a mammal, as opposed to a bird, reptile, fish, etc.”	“Plus cour. (concept excluant l'espèce humaine). Être animé, considéré comme dénué de raison, ne possédant pas les caractéristiques de l'espèce humaine (langage articulé, fabrication des outils, fonction symbolique, etc.). → Bête.”

Table 4: Definitions of “animal” (2)

This shows that, in the folk definition, human beings are clearly excluded from the category [ANIMAL], in English as in French, and mammals are more prototypical than other members. By the way, the influence of this folk definition may explain some of the non-

classical aspects of the expert definition (for instance the fact that humans are sometimes not categorized as animals, although they technically are animals): this proves that expert and folk definition are always interdependent in some way.

b. Google search

Out of the first thirty results obtained from the search “animal” on Google (February 2013), seven were left out for the reasons detailed in the methodology (uncertain provenance, double results etc.), and one had nothing to do with animals. The twenty-two remaining results are the following:

N°	Website address and description:	Animal species referred to:
2	journals.cambridge.org/action/displayJournal?jid=ANM Cambridge Website. “Animal” is the name of an International Journal of Animal Biosciences.	Most probably farm animals and pets. Cf Wikipedia, article “Animal Science”, consulted the 17th of February 2013: “Animal Science is described as “studying the biology of animals that are under the control of mankind”. Historically, the animals studied were farm animals, including livestock and horses, but courses available now look at a far broader area to include companion animals, for example dogs, cats and exotic species.”
5	www.animalaid.org.uk/ “Animal Aid” is the name of an Animal rights group.	All animals.
6	www.bbc.co.uk/nature/animals/ BBC videoclips on animals.	All animals (mammals, birds, reptiles etc., including pets like dogs).
7	www.reaktionbooks.co.uk/series.html?id=1 Series of books on animals.	Clearly opposes humans and animals (including insects, etc.)
8	www.bbc.co.uk/newsround/animals/ CBBC: documents for children on nature and animals.	All kinds of wild animals, but also pets.
9	www.aht.org.uk/ Animal Health Trust : veterinary charity.	Horses, cats and dogs are mentioned as examples.
10	www.animalequality.net/ Organization based in London, for animal rights	All animals (including wild ones)
11	www.defra.gov.uk/food-farm/animals/welfare/	All.

	Animal welfare.	
12	www.fawc.org.uk/ Farm animal welfare committee.	Farm animals.
14	www.understandinganimalresearch.org.uk/ On animal testing	Laboratory animals.
16	themayhew.org/ A centre in London which provides shelter for dogs, cats and rabbits.	Dogs, cats and rabbits.
18	www.noah.co.uk/ National Office of Animal Health and welfare: medicine for animals	Pets and farm animals
19	www.rspca.org.uk/in-action/changingthelaw/.../animalwelfareact RSPCA	Pets
20	www.homeoffice.gov.uk/agencies-public-bodies/apc/ Animal procedures committee (Animals Scientific procedures Act 1986: about laboratory animals)	Laboratory animals.
21	www.ufaw.org.uk/ Welfare for all kinds of animals.	Farm animals, wild animals, animals in captivity (zoos)...
22	www.dailymail.co.uk/.../Invisible-animals-These-Incredible-images-animals-doing-disappearing-act-predators-near.html “Can you spot the invisible animal?” in pictures.	Wild animals
23	www.defra.gov.uk/ahvla-en/ AHVLA: Animal Health Veterinary agency	Especially pets.
24	www.bluecross.org.uk/ Charity helping pets	Pets.
25	www.rspca.org.uk/ “Rescue Dogs, Cats, Pets and Horses”.	Dogs, cats, other pets and horses.
26	www.oxfordanimalethics.com/ Oxford centre on animal ethics	All animals.
27	www.bbc.co.uk/nature/life/Animal Video on the “wonders of the animal kingdom”	All wild animals.
29	www.marchigtrust.org/ UK registered charity against animal cruelty	All animals.

Table 5: Search "animal"

These results confirm that human beings are left out, or are at least very marginal members of the category [ANIMAL], and that mammals in general constitute the centre of the

category. Besides, these results indicate that animals which are closer to humans, for their companionship or usefulness (especially pets, then farm animals, then laboratory animals), are more central to the category [ANIMAL] than other members. The recurrence of animal welfare as a great concern may suggest that human compassion and affection for animals play a role in their centrality, hence cats and dogs are more central than flies for instance, although the latter may be as physically close to humans.

As one of the most general nouns used to refer to several species, the category [ANIMAL] has a global organization which seems not to vary much from English to French. In both languages, it is a superordinate category (indeed, one cannot picture an animal without picturing a specific species), showing quite the same prototype effects and degrees of membership. However, this similarity is no longer true for the two quasi synonyms of “animal” in English, “creature” and “beast”, whose category structures differ from those of their equivalents in French.

2. “Creature”

a. Definition

Here are the definitions of “creature” and “créature”, in order of appearance in the *Oxford English Dictionary* and in the *Grand Robert de la langue française*:

<i>OED</i> 2012, entry “creature”	<i>Grand Robert</i> 2012, entry “créature”
“A created thing or being”	“Être qui a été créé”
“A human being; a person”	“Théol. La créature. L'homme, opposé au <i>Créateur</i> , à <i>Dieu</i> ”
“A living or animate being; an animal, often as distinct from a person”	“Spécialt. Être (non humain) considéré comme analogue à l'homme [...] ; notamment, être démoniaque ou étrange. Créature du démon, créature infernale. Créatures humanoïdes. Des créatures venues d'un autre monde, d'une autre planète, de l'espace.”

Table 6: Definitions of "creature" and "créature"

While the first two definitions are similar in English and in French and do not specifically refer to animals, the third definition deserves more attention.

According to this definition, in both languages, the category [CREATURE] visibly excludes human beings. But while in English, “creature” is clearly defined as a synonym of “animal”, in French, the term “créature” rather denotes beings which are more or less anthropomorphic, often imaginary or supernatural (aliens, demons etc.). Thus the members included in the English category [CREATURE] are expected to be different from the members of the French category [CREATURE].

b. Google search

Among the first thirty results obtained from the search “creature” on Google (February 2013), twelve were discarded for uncertain provenance or double results, two mentioned the noun “creature” out of context, and two did not refer to any beings, either real or imaginary (“creature” was used in its very first sense of creation, art, etc., in the names of a creative agency and of a theatre company). This table gathers the fourteen remaining results:

N°	Website address and description:	Animal species referred to:
1	www.creaturediscomforts.org/ Cheshire Disability Association. Cartoons with dogs in wheelchairs as heroes.	Dogs.
7	www.telegraph.co.uk/.../Bigfoot-like-creature-spotted-in-Tunbridge-Wells.html An article from the <i>Telegraph</i> , about walkers having seen a monster in Kent. “Beast” is used alternately.	Bigfoot-like, terrifying, unidentified creature with “demonic eyes”.
8	www.telegraph.co.uk/.../Humans-evolved-from-furry-insect-eating-creature.html An article from the <i>Telegraph</i> dealing with a furry prehistoric creature that has just been discovered by scientists. “Animal” is used alternately.	Prehistoric animal.
12	www.blankslatebooks.co.uk/our-books/creature-couture/ Photographs of self-made objects (small, coloured plush toys).	Imaginary beings.
18	www.cam.ac.uk/.../a-tenth-of-quirky-creatures-active-genes-are-foreign/ Webpage on genetics.	Microscopic, asexual animal (bdelloid rotifer), described as “quirky”.
20	www.gq-magazine.co.uk/.../laura-marling-a-creature-i-dont-know-album-streaming In the name of a folk music album, “A creature I don’t know”.	
21	endangeredalphabet.com/ “Endangered creatures” is used as a synonym of “threatened	Wild animals.

	animal species”.	
22	www.dailymail.co.uk/.../First-creature-walk-land-dragged--like-crutches.html Article from the <i>Daily Mail</i> about a scientific discovery.	Prehistoric animal (first creature to be able to move on land).
23	www.dailymail.co.uk/.../Seal-attack-Hungry-creature-eats-sharks-rare-images-sea-mammal-turning-tables-predator-deep.html Article from the <i>Daily Mail</i> about a hungry seal unusually eating sharks.	Ferocious seal.
24	www.dailymail.co.uk/.../Half-jellyfish-half-slug-strange-sea-creature-washing-Washington-coast-surprise-marine-experts.html Article from the <i>Daily Mail</i> about a new animal discovered in the USA.	Animal described as “strange”, half jelly-fish, half-slug, which recently appeared on the coasts due to climate change.
25	www.dailymail.co.uk/.../Is-shrew-like-creature-taste-insects-earliest-ancestors.html Article from the <i>Daily Mail</i> , reporting the same discoveries as in result n°8. “Animal” is used alternately.	Shrew-like, prehistoric animal.
26	www.dailymail.co.uk/.../The-Beast-Tunbridge-Wells-Terrified-walker-claims-8ft-tall-creature-demonic-red-eyes-long-arms-roared-historic-towns-woods... Article from the <i>Daily Mail</i> , reporting the same event as in result n°7. “Beast” is used alternately.	Bigfoot-like, terrifying, unidentified creature with “demonic red eyes”.
28	www.lauramarling.com/news/tag/a-creature-i-dont-know/ Same folk music album as in result n°20.	
29	www.bbc.co.uk/nature/21029364 News on scientific discoveries. “Animal” is used alternately.	“Bizarre-looking”, tentacled prehistoric animal.

Table 7: Search "creature"

These results confirm that human beings are excluded from the category [CREATURE]. On the other hand, the question of a possible synonymy between “creature” and “animal” in English is slightly more complex to answer.

Indeed, in several results (n°8, 21, 25, 29), the two words are used alternately to refer to the exact same being, which suggests that their meanings are closely related. But the table obtained from the search “creature” is undeniably very different from the table obtained from the search “animal”: pets, as well as farm and wild animals, are virtually absent, for instance. Nevertheless, there are a few exceptions: in result n°21, for example, the term “creature”

denotes wild animal species, and in result n°1, it refers to dogs (which are among the most prototypical members in the category [ANIMAL]). But it is worth mentioning that the dogs referred to in result n°1 are not real dogs, but cartoon characters, that is to say human creations (this goes back to the first definition of “creature”, as the result of a creation). Besides, they are depicted sitting on wheelchairs, which makes them look like disabled persons. This closeness to human beings is reminiscent of one of the key elements of the French definition of “créature” (a living being which is not human, but analogous to a human being), and it can also be found in results n°7 and 26 (in the “Bigfoot-like creature”, which is “tall”, has “long arms” and “demonic eyes”). This tends to suggest that the English category [CREATURE] has more common points than expected with the French one.

Many animals referred to by the term “creature” are described as weird (“strange”, “bizarre”, “quirky”...). Some of them are frightening (the Bigfoot-like monster or the ferocious seal). Some of them have a shape that is hard to define (for instance the sluggish animal in result n°24 or the microscopic bacteria in result n°18) or require many efforts to be identified (by scientists). Moreover, many of them disappeared a time long ago (results n°8, 22, 25, 29) or appeared very recently (result n°24). To sum up, in nearly all cases, these animals appear as unusual. Contrary to the referents of “animal”, which are prototypically familiar and close to humans (like pets or farm animals), the referents of “creature” are prototypically unfamiliar and unordinary. They can be extinct or imaginary, but also living animals which simply do not correspond to the idea we generally have of them (like the seal which eats sharks in result n°23). What seems to characterize most of these animals is that the speaker has difficulties in recognizing and categorizing them: there is something about them which hinders their identification. Even the title of the folk music album (“A creature I don’t know”, results n°20 and 28) illustrates this problem. By the way, it is worth noticing that in many results the noun “creature” is not used alone, but needs expansion through comparison (“shrew-like”, “Bigfoot-like”, “half-jellyfish half-slug”...) which, together with numerous adjectives, helps the reader form a clearer mental image of the referent.

The unfamiliarity which appears as characteristic of many referents of the word “creature” draws another parallel with the French definition of “créature” (as a strange living being). On the other hand, while demons or aliens may well be the prototypical members of the French category [CREATURE], it is very unlikely to be the case in English. Indeed, although the referents of “creature” are often strange and unusual (sometimes even frightening), they are nevertheless real animals in their wide majority, fantastic beings being

visibly rarer. French, by contrast, is more reluctant to use the word “créature” to refer to actual animals, whose existence in the world is experientially and scientifically verified (even if they are microscopic or disappeared years ago).

3. “Beast”

a. Definition

<i>OED</i> 2012, entry “beast”	<i>Grand Robert</i> 2012, entry “bête”
<p>1. “A living being, an animal [...]. Now restricted in literary use as in sense 2; but still widely applied in dialect and colloquial use, including e.g. newts, insects, centipedes.”</p> <p>2. a. “A quadruped (or animal popularly regarded as such), as distinguished from birds, reptiles, fishes, insects, etc., as well as from humans. (Now the ordinary literary use.)”</p>	<p>“Tout être animé, l’homme excepté. → 1. Animal.”</p> <p>“Animal exprime un règne particulier de la nature [...]: il comprend l’homme; bête signifie une classe d’animaux de laquelle l’homme est exclu. [...] Ainsi, on devra dire : comparer l’homme aux autres animaux, et le comparer aux bêtes [...] Lafaye, Dict. des synonymes, Animal, bête, brute.”</p> <p>“REM. Bête s’oppose à animal en ce que le mot n’est pas scientifique; il ne désigne donc que les animaux perçus comme tels par la culture [...]; il désigne notamment les animaux terrestres et aériens (mammifères, oiseaux, reptiles, insectes...); il se dit peu en parlant des poissons. Ses critères d’emploi sont surtout pragmatiques : langage enfantin, naïf, etc.”</p>

<p>2.</p> <p>b. “An animal of the chase; four-footed game”</p> <p>c. “wild beast: an animal not domesticated [...], now esp. a ferocious animal from a foreign land”</p> <p>d. “beast of prey n. an animal that kills and feeds on the flesh of other animals”</p> <p>3. “A domesticated animal owned and used as part of farm ‘stock’ or cattle [< French <i>bestiaux, bétail</i>]”</p> <p>a. “gradually more or less restricted to the bovine kind; now chiefly applied by farmers, graziers, etc. to fattening cattle. (In this sense there is also a collective plural <i>beast.</i>)”</p> <p>b. “An animal used in riding, driving, etc., as the horse and ass; a ‘beast of burden,’ a ‘yoke beast,’ a draught animal. [In some parts of England, <i>beast</i> in the singular means spec. ‘horse,’ while the plural <i>beasts</i> [...] means ‘oxen.’]”</p>	<p>“Une belle bête. Une petite bête → Bestiole. [...] Des peaux de bêtes. [...] Nos amies les bêtes”</p> <p>“Animal domestique. Une bonne, une brave bête. [...] Une bête à cornes. [...] Une bête de somme. [...] Les bêtes : les bestiaux, le bétail. Mener, rentrer, soigner les bêtes. Rural. Il faut donner à manger aux bêtes (incluant les petits mammifères, lapins, par exemple, mais non les animaux de basse-cour)”</p> <p>“Bête sauvage : animal sauvage, notamment dangereux. → Fauve. Bêtes de proie. Bête féroce. ”</p> <p>“Les bêtes : les animaux féroces qui participaient aux Jeux du Cirque. ”</p> <p>“Une bête inconnue, étrange, curieuse. Loc. Regarder qqn comme une bête curieuse. ”</p> <p>“Absolt. Les bêtes, les insectes, la vermine.”</p> <p>“Spécialt (contexte de la chasse). Bête chassée, poursuivie. [...] Grandes bêtes (cerfs, daims, chevreuils) et menues bêtes (lièvres, renards). ”</p> <p>“Loc. (Insectes). Bête à bon Dieu [...] : coccinelle.”</p> <p>“(Animaux imaginaires). Relig. La bête de l’Apocalypse. ”</p> <p>“Hist. La bête du Gévaudan : animal supposé qui terrorisa la France à la fin du xviii^e siècle”</p>
---	--

Table 8: Definitions of "beast" and "bête"

The first definition of the word “beast” suggests that historically, it was used as a synonym of “animal” (and therefore referred to a wide variety of species, including insects), but then it gradually evolved and restricted itself to quadrupeds (excluding insects, but also birds, reptiles, and fishes). In French, by contrast, “bête” seems to have a larger extension, since it includes mammals, birds, reptiles and insects (fishes being more marginal). In both languages, human beings are clearly excluded from the category, and the importance of popular culture in its definition is emphasized. Indeed, contrary to [ANIMAL], [BEAST] and [BETE] have no expert definition at all. They visibly show degrees of membership and of centrality, which may be different from one language to another.

In English, game (and especially fourfooted game) is mentioned first, followed by wild, ferocious animals, and finally domesticated animals (cattle, then draught horses etc.). In French, on the contrary, domesticated animals (especially cattle) appear first, followed by wild animals, insects (which, strangely enough, are not even members of the English category, except in dialect, but have an essential place in the French category) and finally chased animals. In both languages, imaginary and fantastic animals are apparently marginal.

b. Google search

The question remains whether the difference that has been noticed in the order of the definitional elements in the English and French dictionary entries reflects a real difference in the degrees of centrality of the various members of the categories [BEAST] and [BETE]. The Google search “beast” (Februray 2013) intends to provide an answer to this question. Out of the first thirty results obtained, five were left out for uncertain provenance and fifteen were irrelevant (“beast” is an acronym, or part of a brand name, etc.). The noun denoted animate beings in only three results, which are the following:

N°	Website address and description:	Animal species referred to:
11	www.beastquest.co.uk/Default.aspx Fantasy book. “Beast” is used as a synonym of “monster”, “dragon” etc. (“an evil wizard has enchanted the magical beasts of Avantia - only the true hero can free the beasts”)	Fantastic animals.
24	www.arconline.co.uk/whats-on/christmas.../beauty-and-the-beast “Beauty and the Beast” (Disney musical)	Prince turned into a hideous creature by a witch.
29	www.dailymail.co.uk/.../The-Beast-Tunbridge-Wells-Terrified-walker-claims-8ft-tall-creature-demonic-red-eyes-long-arms-roared-historic-towns-woods... “The Beast of Tunbridge Wells” (see “creature”, result n°26)	Bigfoot-like creature.

Table 9: Search “beast”, literal use

Surprisingly enough, “beast” is not even used once in this table to designate existing animal species. They are always imaginary beings, similar to monsters and defined as magical or supernatural. This goes in a completely different direction from the definition of the *Oxford English Dictionary*, which mentioned in the first place animals existing in reality, especially game.

Although many results were not conclusive, some of them, which are detailed below, may still prove interesting to outline what the term “beast” means and evokes in the mind of a native speaker:

N°	Website address and description:
9	mbwales.com/en/.../beast.../beast_of_brenin.aspx “Beast of Brenin: name of a mountain biking trail in Wales, described as a “toothy, occasionally savage intense trail”
13	www.burgersatblacks.co.uk/the-beast-2 The Beast : name of a giant hamburger (“beat the beast”)
15	www.purepersonaltraining.co.uk/index.php?page=pure_corporate The Beast : name of a trail involving many obstacles.
19	hellyhansenbeautyandthebeast.co.uk/ “Beauty and the Beast”: name of a marathon challenge (“can you tame the beast?”)
21	www.telegraph.co.uk/.../The-Beast-from-the-East-dumps-snow-on-Europe-and-is-heading-for-Britain.html The Beast from the East = name given in meteorology to an icy blast of air.
25	www.exmoorbeast.org/ “Exmoor Beast”: name of a cycle challenge.
28	www.baldocktown.co.uk/.../Baldock_Beast_Half_Marathon_2013.aspx “Baldock Beast Half Marathon”

Table 10: Search “beast”, metaphorical use

In a surprisingly high number of results (n°9, 15, 19, 25 and 28), “beast” is metaphorically used to refer to marathons, or cycle trails which are known as particularly intense or difficult and which involve many obstacles. Sometimes the metaphor is extended through expressions in which runners or cyclists are challenged to “tame the beast”, for instance. This may suggest that the prototypical beast is seen as a ferocious, “toothy” animal (result n°9), which somehow embodies the violence inherent to nature and its elements (similarly, in result n°21, “beast” refers to a very cold wind). This explains why the relation between beasts and human beings often appears as being based on confrontation: in result n°13, “the beast” designates a hamburger which is so big that only the “bravest” ones can “beat” it, that is to say eat it entirely.

In fact, chased animals may be central to the English category [BEAST], but among them, animals considered as ferocious or dangerous (like wolves or bears) are certainly more central than others (like deer or hares). Besides, while “beast” was explicitly said to designate mostly “quadrupeds”, results n°24 and 29 show that it is not so simple: indeed, both of their

referents are more or less anthropomorphic and stand on two legs. “Beast”, as well as “creature”, can apparently refer to a wide range of beings, real or imaginary, which implies that the category boundaries are not definite.

4. “Pet”

a. Definition

“An animal (typically one which is domestic or tame) kept for pleasure or companionship.” (*OED* 2013, entry “pet”)

First of all, what is interesting about the English noun “pet” is that its meaning cannot be conveyed with a single noun in French. The only way to translate it is to take the noun “animal” and add an adjective (“domestique”) or a complement (“de compagnie”) in order to form a subcategory within the category [ANIMAL], and which is dependent on it.

Moreover, the definition of the category [PET] is not based on features or characteristics which are intrinsic to its potential members, but on the way humans “use” them, on the part they play, the purpose they serve in human society.

b. Google search

Out of the 30 results obtained from the search “pet” on Google (March 2013), eighteen were irrelevant (for instance, “pet” is used as an acronym for “Preliminary English Test”). This table describes the twelve remaining results:

N°	Website address and description:	Animal species referred to:
8	www.dailymail.co.uk/.../Family-discover-missing-pet-tortoise-locked-store-room-THIRTY-YEARS-vanished--shes-alive.html Article from the <i>Daily Mail</i> about a “missing pet tortoise”	Tortoise
9	www.dailymail.co.uk/.../Pet-Charity-receive-100-000-legacy-widow-dog-death.html Article from the <i>Daily Mail</i> about a generous legacy offered to a pet charity. “Animal charity” is used alternately.	Unspecified
12	www.britishairways.com/travel/pet/public/en_us “Transporting your pet on a flight operated by British Airways”	Unspecified
14	www.ea.com/uk/pet-society-vacation-iphone Video game involving colourful, imaginary pets.	Imaginary animals.

15	www.pethealthcouncil.co.uk/ Website of the Pet Health Council. Dogs are pictured as examples.	Dogs etc.
19	www.waltham.com/ Website of a centre for pet nutrition. “Animal nutrition” is used alternately. Cats and dogs are mentioned as examples.	Cats, dogs, etc.
20	www.loc8tor.com/uk/promotions/loc8tor-pet.html Locating device for pets. Cats and dogs are taken as examples.	Cats, dogs, etc.
21	www.telegraph.co.uk/finance/personalfinance/insurance/pet/ Pet insurance. Cats and dogs are mentioned as examples.	Cats, dogs, etc.
22	www.moshimonsters.com/ “Adopt your own pet monster”	Imaginary animals.
24	www.goldenarrowshippers.com/ Website specialized in shipment of “dogs, cats and other small pets”.	Cats, dogs, etc.
29	www.pdsa.org.uk/pet-health-advice/pdsa-pet-fit-club Pet fit club against pet obesity. Cats and dogs are taken as examples.	Cats, dogs and possibly rabbits.
30	natgeotv.com/uk/extreme-pet-rescue Extreme Pet Rescue (TV programme on National Geographic Channel)	Wild animals living in captivity: tigers, lions, etc.

Table 11: Search "pet"

The first thing to notice is that certain members of the category [PET] clearly impose themselves as prototypical instances: these members are cats and dogs, which are also the most frequent animals in English homes.

Moreover, these results confirm that the structure of the category [PET] is not based on the intrinsic qualities or outer appearance of its members, but on the role they are invested with by humans. This explains why in result n°8, a tortoise is referred to by the noun “pet”, although it apparently shares very few physical attributes with cats and dogs, the category prototypes. Indeed, it seems that animals are likely to be defined as “pets” if humans keep them “for pleasure or companionship”, whether they are mammals, fishes or reptiles, whether they are traditionally domesticated or exotic species. Even tigers and lions living in zoos and circuses are referred to as pets in result n°30, although they are probably very marginal members of the category (as shown by the adjective “extreme”, which needs to be added so that the title of the programme makes sense).

Besides, it is worth noting that “pet” can be used in two different ways: either it completely replaces the noun denoting the animal species (“dogs, cats and other small pets”,

result n°24) or it is placed just before it (“pet tortoise”, result n°8), which shows that it does not function exactly like “animal”, “creature” or “beast”, although they are sometimes used alternately (for instance, “pet charity”/“animal charity”).

5. “Deer”

a. Definition

<i>OED</i> 2013, entry “deer”	<i>Grand Robert</i> 2013, entry “cervidés”
“The general name of a family (<i>Cervidæ</i>) of ruminant quadrupeds, distinguished by the possession of deciduous branching horns or antlers, and by the presence of spots on the young.”	“ Zool. Famille de mammifères ongulés artiodactyles ruminants dont les mâles portent des appendices frontaux de nature osseuse [...] se renouvelant chaque année. — Au sing. <i>Un cervidé.</i>

Table 12: Definitions of “deer” and “cervidé”

These two definitions of the nouns “deer” and “cervidés” are expert definitions, as indicated by the vocabulary used (“ruminant quadrupeds” etc.) and the Latin reference (*Cervidae*). Besides, it is worth noting that both entries are in plural, which emphasizes that “deer” and “cervidés” actually refer to a biological family encompassing several species, rather than to these species themselves.

As expected, the English and French definitions are extremely similar, since they are based on the same scientific criteria. It is also highly probable that “deer” and “cervidé” refer to the same animal species. In fact, [DEER] and [CERVIDE] do not seem to distinguish themselves very much from the vast number of biological categories which are placed higher than species in the taxonomical hierarchy (like [BIRD], [REPTILE] etc.). On the other hand, what does not appear in dictionaries but is nevertheless capital is the way “deer” is concretely used by speakers, as compared with the French “cervidé”...

b. Google search

Here are the results obtained from the search “deer” on Google (February 2013), after six of them have been discarded for uncertain provenance or double results.

N°	Website address and description:	Animal species referred to:
1	www.bbc.co.uk/nature/life/Deer “The deer family contains 44 living species”	Deer family as a whole

2	rumdeer.biology.ed.ac.uk/ Red deer research on the Isle of Rum.	Red deer
5	www.thedeerinitiative.co.uk/about_wild_deer/ Website providing information on the species of deer living in the UK.	Red deer, roe deer.
6	www.telegraph.co.uk/.../Deer-break-into-hors... Newspaper article. "Three deer break into horse racetrack". Also referred to as "stags" and "animals".	Unspecified
7	www.bds.org.uk/ Website of the British Deer Society: "anything you need to know about deer in the UK".	Deer in the UK.
8	www.snh.gov.uk/about-scotlands-nature/species/.../land.../deer/ Website on Scotland's deer.	Red deer, roe deer, fallow deer, sika deer, woodland deer, hill deer, muntjac, Chinese water deer.
9	www.fallow-deer-project.net/ International research project on fallow deer.	Fallow deer
10	www.dcs.gov.uk/Deer%20Management/default.aspx Website about "Deer in Scotland"	Deer in Scotland.
11	www.vetdeersociety.com/ Website of veterinary Deer Society.	Deer in the UK.
12	www.royalparks.org.uk/parks/bushy-park/flora-and-fauna/deer Webpage on Bushy Park. "Warning: Deer are wild animals. Please keep at least 50 metres away from the deer"	Red deer, fallow deer.
13	www.royalparks.org.uk/parks/richmond-park/richmond.../deer Webpage on Richmond Park.	Red deer, fallow deer.
14	www.guardian.co.uk/.../deer-running-chelmsf... Website of the <i>Guardian</i> . Video entitled "Wild deer running through Chelmsford injures woman".	Unspecified.
15	www.ashdownforest.org/wild/deer.php Website on Ashdown Forest.	Roe deer, fallow deer, sika deer, muntjac.
16	www.dailymail.co.uk/.../Wonderful-walks-autumn-Follies-frolicking-deer-Lyme-Park-Cheshire.html Newspaper article.	Red deer, fallow deer
17	www.telegraph.co.uk/.../Animal-rights-campaigner-Brian-	Unspecified

	May-allowed-deer-to-be-culled-on-his-estate.html Newspaper article.	
18	oxforddictionaries.com/definition/english/deer Out of context	
19	www.naturalengland.org.uk/ourwork/regulation/.../deer.aspx “Advice and legislation relating to the management and control of deer.”	Species of deer in the UK.
23	www.newforestnpa.gov.uk/info/20090/wildlife/146/deer Website of the New Forest.	Species of deer in the UK.
24	www.basc.org.uk/en/departments/deer.../advice/deer-seasons.cfm Website of the British Association for Shooting and Conservation.	Species of deer in the UK.
26	www.lincolnshiredeergroup.co.uk/ Website on Lincolnshire wild deer.	Red deer, roe deer, fallow deer, muntjac, sika deer and Chinese water deer.
27	www.theweek.co.uk/world-news/.../skateboarder-crashes-deer-40mph-video Video. “Skateboarder crashes into deer at 40mph”	Unspecified
28	www.new-forest-national-park.com/red-deer-fact-file.html Website of the New Forest.	Red deer
29	www.independent.co.uk/.../were-here-for-the-deer-why-a-vegetarian-is-trying-to-persuade-us-to-eat-wild-venison-8274640.html Newspaper article about a campaign which encourages children to eat deer.	Fallow deer
30	now-here-this.timeout.com/.../oh-deer-horny-stag-chases-man-up-a-tree/ Blog from <i>Time Out London</i> (city guide). Video entitled “Deer chases man up a tree”. “Stag” is also used”.	Unspecified

Table 13: Search "deer"

The most obvious difference that may be noticed between the use of “deer” in English and the use of “cervidé” in French, is that “cervidé” is a more formal word, restricted to the scientific domain. For instance, it would never be used in the place of “deer” in the title of the newspaper article “Skateboarder crashes into deer” (result n°27), or in the blog article entitled “Deer chases man up a tree” (result n°30). In fact, while [CERVIDE] is an expert category,

[DEER] is both an expert and a folk category. But this is not the only difference between the English and the French category.

Indeed, what is particularly interesting is that [DEER] and [CERVIDE] basically include the same members, but while the latter is a superordinate category, the former is a basic level category.

If a French speaker watches the video of result n°30 (in which a deer “chases a man up a tree”) or that of result n°14 (in which another deer “charges down Chelmsford High Street in Essex”), the noun “cervidé” is very unlikely to come to his mind in the first place: instead, he would probably call these animals “cerf” or “biche” (depending on the presence or absence of antlers, which is a more or less reliable indication of the sex of the animal). “Cerf” and “biche” are the nouns corresponding to the male and female of a particular species of deer, the red deer. Yet, even if the deer visible in the two videos were not red deer, but another species of deer (for instance, roe deer, “chevreuil” and “chevrette” in French), a French speaker would nevertheless refer to them as “cerf” or “biche”. In fact, while [CERVIDE] is a superordinate category (and [CHEVREUIL] and [CHEVRETTE] subordinate categories), [CERF] and [BICHE] are basic level categories in French. Being highly prototypical members (or typical instances) of the category [CERVIDE], they metonymically stand for the entire category (see III, 1, c on metonymic models in the first chapter), which is why a French speaker can refer to a roe deer as a “cerf”, meaning that it is a member of the category [CERVIDE], and not that it is a red deer.

In English, by contrast, [DEER] is already a basic level category, exactly like [CHAIR] (see the first chapter). Indeed, as the noun “chair” frequently refers to any particular type of chair in everyday situations, “deer” is very often used alone to designate any of the various species of deer (red deer, roe deer, muntjac, etc.): results n°2, 5, 8 etc. And as the subcategories of [CHAIR] are mainly compounds formed from the basic level noun “chair” (kitchen chair, dentist’s chair, rocking chair etc.), the noun “deer” is itself an element in the name of many of its subcategories (“red deer”, “roe deer”, “fallow deer”, “sika deer”, “Chinese water deer” etc.)

6. “Bug”

a. Definition

<i>OED</i> 2013, entry “bug”	<i>Free Dictionary</i> 2013, entry “bug”
“The <i>Cimex lectularius</i> , more fully <i>bed-bug</i> or house-bug, a blood-sucking hemipterous insect found in bedsteads and other furniture, of a flattened form, and emitting an offensive smell when touched.”	“A true bug.”
“Applied to insects of the order Hemiptera or <i>Heteroptera</i> , to which the bed-bug belongs.”	“An insect or similar organism, such as a centipede or an earwig.”
“A microbe or germ; also, a disease.”	“A disease-producing microorganism: <i>a flu bug.</i> ”

Table 14: Definitions of “bug”

These two definitions indicate that the noun “bug” originally refers to a very particular insect (as shown by the Latin designation, *Cimex lectularius*); its use is then extended to physically similar insects (belonging to the same biological family, *Hemiptera* or *Heteroptera*), but also to a much wider range of insects, including centipedes (*Chilopoda*) and earwigs (*Dermaptera*), and finally to microbes and germs.

This shows that, interestingly enough, [BUG] is not a standard prototype category which contains all insects, with the bed-bug as a highly prototypical member and microbes as very marginal members. It is in fact a radial category.

Among the various subcategories constituting the radial category [BUG], [BED-BUG] is the central one, because it concentrates all the ICMs against which [BUG] is understood (this explains why the *Free Dictionary* defines the bed-bug as the “true” bug). The other subcategories are more or less distant deviations from the central case, and they are all connected to it in the form of a chain.

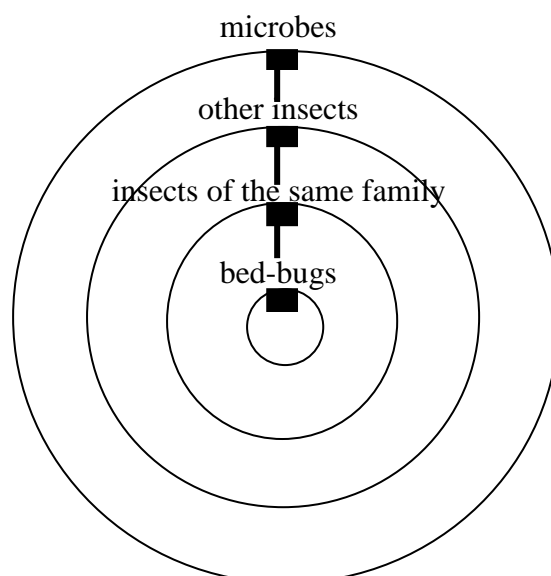


Figure 5: Chaining in the category [BUG]

The nature of the motivation links connecting these various levels is quite complex, because they involve a wide variety of cognitive models, which serve to establish a relation of similarity from bed-bugs to insects of the same family, then from this insect family to some other insect families, and finally from these other insect families to microbes. These ICMs may include small size, brownish colour, a certain overall shape, a certain habitat and a particular way of moving on the ground, for instance. Another aspect which probably plays a considerable part is harmfulness (strangely enough, it was also a key property in Dyrbal categories, as studied in the first chapter). This would explain why microbes and germs are referred to by the noun “bug” (although they remain very peripheral to the category): indeed, like bed-bugs and similar insects, they are small living beings perceived as harmful to humans.

“Bug” has no real equivalent in French. Therefore, many members of the English category [BUG] are commonly referred to as “insectes” by French speakers, which is actually closer to the English “insect” than to “bug”.

Grand Robert 2013, entry “insecte”
“ Zool. Mod. Petit animal invertébré articulé (<i>Arthropodes, Antennates ou Mandibulates</i>), à six pattes, souvent ailé, respirant par des trachées, et subissant des métamorphoses. ”
“ Cour. (incorrect scientifiquement, quand l'espèce n'appartient pas à la classe des insectes, ex. : arachnides). Petit animal, souvent ailé, appartenant soit à la classe des insectes, soit à celle des arachnides, des myriapodes...”

Table 15: Definition of “insecte”

The first difference that is visible between the two categories [BUG] and [INSECTE] lies in the degrees of membership and centrality. While microbes and germs are clearly members of the English category [BUG], they are completely excluded from the French category [INSECTE]. And while bed-bugs are undeniably the centre of the category [BUG], they may not be very central to the category [INSECTE].

Another important difference is that [BUG] is a radial category, with a centre and a number of extensions derived from this centre and motivated by it, whereas [INSECTE] is probably a more standard prototype category, which originally contains a wide variety of members, some of them being better examples than others.

Finally, [BUG] has no expert definition at all, whereas [INSECTE] has both a folk and an expert definition: hence, depending on the one that is considered, the boundaries of the category can vary.

b. Google search

These are the few relevant results obtained from the search “bug” on Google (May 2013).

N°	Website address and description:	Animal species referred to:
10	www.bbc.co.uk/news/science-environment-22372442 “bug-eye camera”, “ a digital camera that functions like an insect’s compound eye”	Unspecified.
13	www.e-bug.eu/eng_home.aspx?ss=1&cc...t...Bug “Welcome to e-Bug, a place to play games and learn about microbes”	Microbes.
15	www.bbc.co.uk/news/health-21965088 BBC website. “Cystic fibrosis bug can spread between patients”.	Microbe.
20	bedbugfoundation.org/ Website providing information on bedbugs.	Bedbug.
21	www.buglife.org.uk/ “A charity dedicated to maintaining sustainable populations of insects, spiders and earthworms.”	Insects + spiders + worms.
22	www.opalexplorenature.org › Surveys Scientific project. “A nationwide bug hunt that will help scientists learn more about invertebrates.”	Ladybird, butterfly, bumblebee, shieldbug, slug and other insects.
24	www.liverpoolmuseums.org.uk/wml/.../bug-house.as...	Beetles, flies, spiders, scorpions,

	World Museum of Liverpool: the Bug house.	centipedes and millipedes.
--	---	----------------------------

Table 16: Search "bug"

In two results out of seven, “bug” is used to designate microbes, which unequivocally confirms that microbes are an integral part of the members of the category [BUG]. Besides, the bedbug appears in result n°20, which shows its central role; an insect from the same family, the shieldbug, is also mentioned in result n°22.

What is interesting is that the range of insects referred to by the noun “bug” appears to be even wider than previously specified in the dictionary definitions. The results mention insects which are more or less similar to the bug (beetle, centipede...) but also insects whose resemblance to the bug is not obvious (bumblebee, butterfly, fly...) and above all, many small animals which are not insects at all: spiders (which are technically arachnids), worms, slugs, and even scorpions.

In fact, it turns out that [BUG] contains an extremely wide range of living beings. Although its centre is the bedbug (clearly, an insect), the category [BUG] may not be understood against the exact same ICMs as the category [INSECT]. Another aspect to take into account is that, contrary to standard prototype categories, radial categories like [BUG] have extensive boundaries by definition: noncentral subcategories can always be extended further away from the centre (hence they can be considerably smaller than the bedbug, like microbes, or considerably bigger, like scorpions), but they are nevertheless always related to it in some way. This is why [BUG] can refer to a very wide variety of small animals, while still forming a coherent whole.

French speakers, who have no equivalent of the category [BUG], often need to use expert categories instead, and adapt their boundaries accordingly. Hence they mistakenly tend to incorporate spiders into the category [INSECTE] (with animals of similar size), or scorpions into the category [CRUSTACE] (together with the crab, with which it shares many common points). English speakers, by contrast, are less prone to make such approximations, because they have a folk category which can encompass nearly all animals of small size.

III. Nouns denoting either male or female animals

1. “Cock” & “hen”

a. Definition

The two following tables intend to confront the English and French definitions of (first) “cock” and “coq” and (second) “hen” and “poule”. When a noun is mentioned in the body of the definitions and needs to be developed, the own definition of this noun is inserted (in smaller letters), in order to give a complete account of the complexity of nouns like “cock” and “hen” and of the various animal species they are related to.

	<i>OED 2012, entry “cock”</i>	<i>Grand Robert 2012, entry “coq”</i>
1	<p>“The male of the common domestic fowl, <i>Gallus domesticus</i>, the female being the hen. (Often called in U.S., as in Kent, <i>rooster</i>.)”</p> <p>> Rooster. “a. Chiefly N. Amer., Austral., and N.Z., and formerly Eng. regional. A male domestic fowl, a cock. b. A bird or bat that is roosting or that habitually roosts.” (<i>OED 2012, entry “rooster”</i>)</p>	<p>“Oiseau de basse-cour, mâle de la poule (Gallinacés)”</p>
2	<p>“The male of various other birds [...]</p> <p>[Quotations:] [...]</p> <p>“1576 A. Fleming tr. Erasmus in <i>Panoplie Epist.</i> 354 Pigeons bring forth two egges, the first a cocke, the second a henne. 1870 D. P. Blaine <i>Encycl. Rural Sports</i> 862 Avoid killing a hen pheasant, except on..the increase of the hen birds to such a degree as to out-number the cocks.”</p> <p>“See also attrib. uses [...] cock-bird, cock-sparrow”</p> <p>> Cock-bird. “A male bird” (<i>OED 2012, entry “cock-bird”</i>) > Cock-sparrow. “The male of the sparrow” (<i>OED 2012, entry cock-sparrow</i>)</p>	<p>“Mâle (d'une espèce de Gallinacés). ”</p>
3	<p>“In names of birds, as</p> <p style="text-align: center;">blackcock</p> <p>> Blackcock. “The male of the black grouse, <i>Tetrao tetrix</i>; also called <i>heathcock</i>.” (<i>OED 2012, entry “blackcock”</i>)</p> <p style="text-align: center;">gorcock</p> <p>> Gorcock. “The male of the Red Grouse” (<i>OED 2012, entry “gorcock”</i>)</p>	<p>“Coq de bruyère, coq sauvage. → Tétrás ; grianneau, grouse. ”</p> <p>“Coq de roche. → Rupicole. ”</p>

<p style="text-align: center;">heath-cock</p> <p>> Heath-cock. “The male of the heath-bird or Black Grouse (<i>Tetrao tetrix</i>), the Blackcock; in N. America, the Canada grouse and other species.” (OED 2012, entry “heath-cock”)</p> <p style="text-align: center;">moorcock</p> <p>> Moorcock. “The male of the red grouse, <i>Lagopus lagopus</i>. Also (occas.): the male of the black grouse, <i>Tetrao tetrix</i>; a blackcock. Cf. moorhen n.2” (OED 2012, entry “moorcock”)</p> <p style="text-align: center;">peacock</p> <p>> Peacock. “A male peafowl, characterized by brilliant plumage, and a very long tail whose coverts can be erected and fanned out to display their eye-like markings; esp. a male of the common species, <i>Pavo cristatus</i>, which has an iridescent greenish-blue head and breast. Also more generally: = <u>peafowl n.</u>” (OED 2012, entry “peacock”)</p> <p>Peacock pheasant. “Any of several small, long-tailed pheasants of the south-east Asian genus <i>Polyplectron</i>, having plumage marked with iridescent green, blue, or violet eye-like markings” (OED 2012, entry “peacock”)</p> <p>Peacock butterfly. “A nymphalid butterfly, <i>Inachis io</i>, of temperate Eurasia, having predominantly reddish-brown wings with conspicuous eye-like markings” (OED 2012, entry “peacock”)</p> <p>Peacock moth. “Any of several small Eurasian geometrid moths of the genus <i>Semiothisa</i>, esp. <i>S. notata</i>, which has pale wings with dark markings; (b) a very large Eurasian saturniid moth, <i>Saturnia pyri</i>, with prominent eye-like markings on the wings (more fully <i>giant peacock moth</i>)” (OED 2012, entry “peacock”)</p> <p>Peacock fish. “Any of various fishes with brilliant colours or markings, including the cuckoo wrasse, <i>Labrus mixtus</i>, and the peacock bass, <i>Cichla ocellaris</i>; (also) any of various fishes with conspicuous fan-shaped fins or tails, including the guppy, <i>Poecilia reticulata</i>, and tropical fishes of the genus <i>Pterois</i> (family Scorpaenidae).” (OED 2012, entry “peacock fish”)</p> <p>Peacock bass. “A large, brightly coloured cichlid fish, <i>Cichla ocellaris</i> (and related species), with a gold-ringed black eye-like marking at the base of the tail, native to northern South America and also introduced in Florida and Hawaii; also called <i>peacock cichlid</i>.” (OED 2012, entry “peacock bass”)</p> <p style="text-align: center;">woodcock n.</p> <p>> Woodcock. “a. A migratory bird, <i>Scolopax rusticula</i>, allied to the snipe, common in Europe and the British Islands, having a long bill, large eyes, and variegated plumage, and much esteemed as food. Also, the allied <i>Philohela minor</i> of N. America, similar in appearance and habits but smaller. Properly denoting the male bird, but commonly applied to both sexes; cf. wood-hen.</p> <p>b. Applied to other birds. (a) Local name for the pileated woodpecker of N. America, also called log-cock. (b) little woodcock: = woodcock-snipe. (c) sea woodcock.”</p>	<p>“Coq de marais. → Gélinothe.”</p> <p>“Coq héron. → Huppe.”</p> <p>“Coq d'Amérique. → Hocco.”</p> <p>“Coq d'Inde. → Dindon.”</p>
--	--

	<p>“sea-woodcock n. (a) some West Indian bird; (b) applied dial. to various birds, e.g. the bar-tailed godwit, <i>Limosa lapponica</i>, the oyster-catcher or sea-pie n.l, and the little grebe, <i>Trachybaptus fluviatilis</i>. = woodcock-shell; more fully thorny woodcock.”</p> <p>“woodcock-shell n. one of several species of Murex having a long spout resembling a woodcock's bill.”</p> <p>“woodcock-fish n. = snipe-fish.”</p> <p>“woodcock owl n. a local name for the short-eared owl.”</p> <p>“woodcock-snipe n. the great snipe, <i>Scolopax major</i>.”</p> <p>“woodcock pilot n. (also woodcock's pilot) a local name for the golden-crested wren (see quot. 1893).”</p> <p>(OED 2012, entry “woodcock”)</p> <p style="text-align: center;">Turkey cock</p> <p>> Turkey cock. “The male of the turkey” (OED 2012, entry “turkey-cock”)</p> <p style="text-align: center;">cock of the mountain or wood: the Capercailye</p> <p style="text-align: center;">cock of the North: the brambling</p> <p style="text-align: center;">cock of the plains, a North American species of grouse</p> <p style="text-align: center;">the sage-cock (also sage-hen)</p> <p style="text-align: center;">cock of the rock, either of two species of the South American genus</p> <p style="text-align: center;"><i>Rupicola</i> or Cotingas”</p>	
4	<p>“Blue, harvest, salmon cock: local names of a salmon in one of its stages.”</p>	

Table 17: Definitions of "cock" and "coq"

	<i>OED</i> 2012, entry “hen”	Grand Robert 2012, entry “poule”
1	<p>“The female of the common domestic or barn-door fowl, the male of which is the cock.</p> <p>As in the domestic state the females greatly exceed in number the cocks kept, and their economic importance is more prominent, the word <i>hens</i> is also used in some connections as = ‘domestic fowls’ without regard to sex.”</p>	<p>“Femelle du coq, oiseau de basse-cour (<i>Gallinacés</i>)”</p>

2	<p>“With qualifying words [...]</p> <p>Pharaoh's hen: the Egyptian vulture (<i>Neophron percnopterus</i>)</p> <p>Port Egmont hen: the Great Skua of the Falkland Isles.</p> <p>Sea hen.”</p> <p>> Sea-hen. 1. A name for the piper-gurnard, <i>Trigla lyra</i>, and the lump-fish, <i>Cyclopterus lumpus</i>. [Cf. German seehahn (=‘sea-cock’), applied to both fishes.] 2. A local name for the common guillemot, <i>Uria troile</i>, and the great skua, <i>Stercorarius catarrhactes.</i>) (<i>OED</i> 2012, entry “sea-hen”)</p>	
3	<p>“The female of various other birds”</p> <p>[Quotations:]</p> <p>[...]</p> <p>“a1616 Shakespeare <i>As you like It</i> (1623) iv. i. 142 More ieaalous..then a Barbary cocke-pidgeon ouer his hen.”</p> <p>[...]</p> <p>“1879 J. A. Taylor <i>Moutain and Moor</i> 219 An old blackcock crowing on a birch-tree with a dozen hens below it.”</p> <p>“in a wider sense, [the female] of any bird = hen-bird.”</p>	<p>“Femelle de certains gallinacés [...] Poule faisane. Poule d'Inde (vx) → Dinde.”</p>
4.	<p>“Forming the second element in the name of female birds of various species, as</p> <p>guinea-hen</p> <p>> Guinea-hen. “1. The turkey-hen or turkey [...]. 2. The guinea-fowl, or the female of the same.” (<i>OED</i> 2012, entry “guinea-hen”)</p> <p>grey-hen</p> <p>> Grey-hen. “The female of the Black Grouse (<i>Tetrao tetrix</i>), the heath-hen. (The male is called the <u>blackcock n.</u>) (<i>OED</i> 2012, entry “grey-hen”)</p> <p>heath-hen</p> <p>> Heath-hen. “The female of the heath-cock; the Grey-hen.” (<i>OED</i> 2012, entry “heath-hen”)</p> <p>moorhen</p> <p>> Moorhen. “1. A small aquatic rail, <i>Gallinula chloropus</i>, with brownish-black and grey plumage and a red and yellow bill extended into a plate on the forehead, commonly found on or near freshwater in temperate and tropical regions (also called <i>waterhen</i>, (U.S.) <i>common gallinule</i>). Also: any of various other small rails, chiefly of the genus <i>Gallinula</i>. 2. <i>Eng. Regional (north.), Sc., and Irish English.</i> The female of the red grouse, <i>Lagopus lagopus</i>. Cf moorcock.” (<i>OED</i> 2012, entry “moorhen”)</p>	<p>“Poule (suivi d'un déterminant) : mâle ou femelle de diverses espèces d'oiseaux.”</p> <p>“Poule des bois, des coudriers : gélinotte.”</p> <p>“Poule d'Afrique, de Barbarie, de Guinée, de Numidie, de Pharaon : pintade.”</p> <p>“Poule d'eau : oiseau (Échassiers, Rallidés), de la taille d'un pigeon, appelé aussi gallinule. → aussi Foulque. La poule d'eau est chassée comme gibier d'eau.”</p>

	<p style="text-align: center;">peahen</p> <p>> Peahen. A female peafowl.</p> <p style="text-align: center;">water-hen, etc.”</p> <p>> Waterhen. Any of the various ralline birds, esp. the moorhen, <i>Gallinula chloropus</i> [...] The American coot, <i>Pulica Americana</i>. local U.S. (Mass.)</p> <p>“In some of these the name of the male is in -cock, as heath-cock, peacock, etc.”</p>	<p>“Poule sultane : oiseau voisin de la <i>poule d'eau</i> (n. sc. <i>Porphyrio</i>). ”</p>
5.	<p>“A female fish or crustacean.</p> <p>[Quotations:] 1747 H. Glasse <i>Art of Cookery</i> xxi. 164 Cock Lobster is known by the narrow back Part of the Tail... The Hen is soft, and the back of her Tail broader. a1855 G. Johnston <i>Fishes of Berwicksh.</i> (in Yarrell), The Cock and Hen Paidle spawn toward the end of March and in April. At that season the Hen..deposits her spawn among the rocks. 1895 <i>Westm. Gaz.</i> 31 May 5/3 A splendid salmon..The fish (a hen) was taken with a net.”</p>	
6.	<p>“A kind of bivalve shell-fish, <i>Venus mercenaria</i>. Also locally, A fresh-water mussel. Cf. hen-clam.”</p> <p>> Hen-clam. “The name given on the Atlantic coast of North America to two large species of clam, <i>Macra</i> (or <i>Spisula</i>) <i>so lidissima</i> and <i>M. ovalis</i>. On the Pacif coast, the name is transferred to <i>Pachyderma crassatelloides</i>.” (OED 2012, entry “hen-clam”)</p>	
7	<p>“<i>attrib.</i> in sense of ‘female’:</p> <p>a. of birds.</p> <p>[Quotations:] [...] 1600 R. Surflet tr. C. Estienne & J. Liébault <i>Maison Rustique</i> i. xxi. 119 The hen partridge is so fruitfull that [etc.]. 1660 R. Boyle <i>New Exper. Physico-mech.</i> in <i>Wks.</i> (1772) I. 97 Soon after we got a hen sparrow. 1761 G. Edwards in <i>Philos. Trans.</i> 1760 (Royal Soc.) 51 835 The whole upper side nearly resembles that of a hen-pheasant. [...] 1818 Keats <i>Endymion</i> iii. 155 The hen-dove shall not hatch Her ready eggs.</p> <p>b. of fishes, crustacea, etc.</p> <p>[Quotations:] 1865 J. G. Bertram <i>Harvest of Sea</i> (1873) xiii. 266 There are the cock and hen lobster. 1886 R. C. Leslie <i>Sea-painter's Log</i> 21 The hen crab is known from the male by her much wider waistcoat.”</p>	
8	<p>“hen-fish [...] a local name of the bib or pout.”</p>	

Table 18: Definitions of "hen" and "poule"

The first important thing to notice in these definitions is that, in English as in French, as long as there is no particular animal species mentioned in the context, the nouns “cock”/”coq” and “hen”/”poule” necessarily refer to the male and female of the domestic fowl (*Gallus domesticus*). This species is therefore very likely to be the central member of the categories [COCK]/[COQ] and [HEN]/[POULE]. The various other species evoked in the definitions are apparently extensions derived from these central members, which means that [COCK]/[COQ] and [HEN]/[POULE] are probably radial categories.

In English, “cock” and “hen” can be used in various ways to designate these noncentral animal species.

- If the particular animal species referred to is made clear in the context, “cock” and “hen” can be used alone, with just an article (for example, “a cock”, “the hen” etc.) in order to specify the sex of the animal. This works for a great many of bird species (then, “cock” and “hen” are also replaceable by “cock-bird” and “hen-bird”), but also, more rarely, for certain fishes and crustaceans.
- “Cock” and “hen” can be used before the noun of the animal species referred to (with or without a hyphen), again, to specify the sex. As before, this applies to many bird species (“cock-sparrow” etc.), but also to certain fishes and crustaceans (“hen lobster” etc.)
- Besides, “cock” and “hen” are part of the name of various bird species (“woodcock”, “Pharaoh’s hen” etc.). Depending on the nouns, they can refer to the species in general (like “water-hen”), or only to the male or female animal (like “peahen”), or to both (like “guinea-hen” which, depending on the context, can either mean the guinea-fowl, male or female, or only the female). The compounds formed from “cock” and “hen” can themselves constitute elements of the name of other animal species (“peacock butterfly”, “woodcock-fish” etc.).
- “Hen” can be part of the name of animal species other than birds (“hen-clam”, “hen-fish”) but then it refers to these species in general, and not only to the female animal.
- Finally, when used after “blue”, “harvest” or “salmon”, “cock” refers to a salmon at a particular stage of its evolution.

Although “rooster” is presented in sense 1 as being the U.S. equivalent for “cock”, it cannot be substituted to it in any of these situations. And yet it can also refer to other species than the domestic fowl (birds or bats that “habitually roost”), but the motivation link between

the centre and its extensions is obviously not the same as for “cock” (apparently it involves the animal’s way of life, rather than its physical appearance).

All this shows that [COCK] and [HEN] are particularly complex categories, with a great number of extensions derived in various ways from the central case: birds which are similar to the domestic fowl (guinea-hen, woodcock, hen pheasant etc.), but also many other birds (cock-sparrow), and finally completely different animal species like fishes, crustaceans or shells.

In French, [COQ] and [POULE] have fewer extensions. The nouns “coq” and “poule” are used only for birds (which are generally in the same family, or at least very similar to the domestic fowl) but never for animals living under water. Like “cock” and “hen”, “coq” and “poule” can be used to refer to the male or female of certain bird species (“coq faisan”, “poule faisane”), but in much rarer cases than in English. They can also form the name of certain bird species (“coq de bruyère”, “poule d’eau” etc.) but, again, not as frequently nor as widely as in English. Moreover, some compounds which may seem extremely similar in English and in French can still not refer to the same animal species: for instance, the French “poule de Pharaon” designates a sort of woodcock, while the English “Pharaoh’s hen” refers to a vulture (which shows, again, that the extensions of [COQ] and [POULE] remain very close to their centre, the domestic fowl, while the extensions of [COCK] and [HEN] can be derived much further away from it).

b. Google search

The search “cock” on Google (February 2013) gave almost no relevant results on the first pages: many times, “cock” was used as a verb, or was part of the name of a tavern, an inn, a pub or a restaurant.

The search “hen” (February 2013) gave better results, but they were not diverse. Out of the first thirty results, three were left out for uncertain provenance, four did not specifically refer to animals, and all the rest designated the female of the domestic fowl, which confirms that it is the prototypical member of the category [HEN].

Thus, to complement my study, I chose to search “cock bird” and “hen bird” (February 2013), since they appear in the *Oxford English Dictionary* as close equivalents to “cock” and “hen” when the latter are used to specify the sex of the animal. I typed “cock bird” and “hen bird” with inverted commas but without hyphens, so the results obtained could be written,

either with or without a hyphen. After removing the invalid results (uncertain provenance, double results, lack of context etc.), twenty-five results remain for “cock bird”, and twenty-four for “hen bird”; they are presented in the two following tables:

N°	Website address and description:	Animal species referred to:
1	budgerigarsforum.proboards.com/thread/.../when-remove-cock-bird Forum for budgerigar owners. “the cock bird”, “the hen”, “my chicks”	Budgerigar
3	www.alex-davidwoan.co.uk/bsideal.htm “budgerigar cock-bird”	Budgerigar
4	antiquebronze.org.uk/.../bronze-pheasant-cock-bird-statue-english-animal/ “pheasant cock-bird”	Pheasant
5	birdtrek.co.uk/angel/.../wanted-pyrrhura-emmas-cock-bird,202 Birds for sale. “pied cinnamon cockatiel cock-bird”	Pied cinnamon cockatiel
6	birdtrek.co.uk/angel/.../blackheaded-caique-cock-bird,347 Birds for sale. “blackheaded caique cock-bird”	Blackheaded caique
7	overthegate.myfreeforum.org/.../using-a-decent-cock-bird_o_t_t_27332.html Forum. “cock bird”, “hens”	?
8	colourcanary.forumotion.net/t3099-6-year-old-cock-bird Forum for canary owners. “six year old cock bird”, “the hen he was with died”	Canary
9	www.javafinch.co.uk/breeding/breedndx.html Website on Java finches. “bird”, “the cock and hen”, “chicks”	Java finch
10	www.yccuk.com/briankeenane/canbreedterms.html Website on canaries “the cock and hen bird”, “the cock bird”, “the cock”, “the hen”, “chicks”	Canary
11	www.growfruitandveg.co.uk/.../dorking-cock-bird-indian-cornish-game_13432.html Website of a magazine on gardening. “dorking cock bird”, “chicks”	Dorking chicken (domestic fowl)
12	www.theparrotsocietyuk.org/parrot.../item...cock_bird/817	Derbyan

	Parrot society UK website (birds for sale) “derbyan parakeet cock”, “derbyan parakeet cock bird”	parakeet.
13	www.birdtrader.co.uk/senegal_parrot_cock_bird/Parrots/349390 Birds for sale. “Senegal cock bird”, “the hen bird”	Senegal parrot.
14	www.birdtrader.co.uk/baraband_cock_bird/Parrots/349393 Birds for sale. “barraband cock bird”	Barraband parrot.
17	budgerigarsforum.proboards.com/thread/.../brown-cere-on-cock-bird Forum on budgerigars. “one of my cock birds”	Budgerigar.
18	www.trade-it.co.uk/doncaster/farming.../asil-cock-bird-KPF468649 Birds for sale. “Asil cock bird”	Asil, or aseel (domestic fowl)
20	www.birds4saleuk.co.uk/12347-meyers-cock-bird-for-sale.htm “Meyer’s cock bird”	Meyer’s parrot.
21	www.geograph.org.uk/photo/2787233 Context of hunting. “a cock bird”	? (game)
22	www.birds4saleuk.co.uk/5851-wanted-blue-pennant-cock-bird.htm Birds for sale. “blue pennant cock bird”	Blue pennant parakeet.
23	www.birds4saleuk.co.uk/9513-american-king-cock-bird-for-sale.htm Birds for sale: “American king cock bird”	?
24	preview.hosts.co.uk/~tinsmiths.co.uk/shop.cgi?visit... “Spangled cock bird” represented on a picture.	Spangled chicken (domestic fowl)
25	www.geolocation.ws/v/W/File:Spot%20the%20pheasant%5E%20.../-/en “the cock bird”	Pheasant
26	www.go-self-sufficient.com/chickeggs.htm Website on self-sufficiency. “cock”, “cock bird”	Domestic fowl.
28	www.lowcostliving.co.uk/chickens/chickens-meat-breeds.php Website on self-sufficiency. “cock-bird”	Domestic fowl.
29	www.preloved.co.uk/adverts/list/3360/birds.html?keyword Birds for sale.	Goldfinch mule / linnet mule

	“cock birds”	
30	www.sjdjavas.co.uk/breeding.htm Website on Java sparrows “a cock and a hen”, “the cock bird”, “chicks”	Java sparrow

Table 19: Search "cock bird"

N°	Website address and description:	Animal species referred to:
1	news.bbc.co.uk/2/hi/uk_news/scotland/4812508.stm BBC Website. “hen bird flu”	Domestic fowl.
2	birdtrek.co.uk/.../timneh-african-grey-hen-bird-8years-old-proven,407 Birds for sale. “Timney African Grey hen bird”	Timney African Grey Parrot
3	www.ebay.co.uk/itm/...HEN-BIRD...-/221185737632?... Ebay (a toy for sale representing a chicken) “chicken hen-bird”	Domestic fowl
4	www.spreadshirt.co.uk/dancing-chicken-hen-bird-design-t-shirts-C4408A22942992 “hen”	Domestic fowl
6	www.theparrotsocietyuk.org/foRum/viewtopic.php?f=10&t... Forum for parrot owners. “hen bird”, “hen”, “cock”	Budgerigar
7	budgerigarsforum.proboards.com/thread/3468/hen-bird-died Forum for budgerigar owners. “hen bird”, “cock bird”, “hen”, “cock”	Budgerigar
8	indiangameieland.webs.com/apps/photos/photo?photoid... Website on the breeding of Indian game. “chick”, “a hen bird”	Indian game.
9	www.birdtrader.co.uk/siskin_hen_bird/Bird-Accessories/23836 Birds for sale. “siskin hen bird”	Siskin
10	www.birdtrader.co.uk/_wanted_stanley_hen_bird_/.../331657 Birds for sale. “Stanley hen bird”	Western Rosella, or Stanley Rosella (parrot)

11	www.birdtrader.co.uk/wanted_green_cheek...hen_bird/.../21913 “green cheek conure hen bird”	Green-cheeked conure (parakeet)
12	www.jblimages.co.uk/_photo_1844612.html Photograph of a “red grouse hen bird”	Red grouse
13	www.africangreyparrotcentre.co.uk/.../what-is-the-best-african-grey-cock-or-hen-bird-for-a-woman-owner/ Website of the African Grey Parrot Centre. “African grey cock”, “hen bird”	African Grey Parrot
16	www.yccuk.com/briankeenan/canbreedterms.html Same as in “cock bird”, result n°10.	Canary.
18	lakelandbirdkeepers.co.uk/signs_of_an_eggbound_hen__treat.htm Website of Lakeland Parrot and Bird Keepers. “hen bird”, “hen”, “chick”	Parrot or parakeet.
20	www.spreadshirt.co.uk/i-need-followers-hen-bird-tweeter-bird-shirts-C4408A22384314 T-Shirt representing a bird (logo of the social network Twitter) “hen”	Undefined.
21	freespace.virgin.net/cobber.budgies/sexingadults.html U.S. website on budgerigars. “cock budgie”, “hen budgie”, “hen”, “cock”	Budgerigar
22	digital.nls.uk/special-collections-of-printed.../pageturner.cfm?id Traditional Scottish song “wee hen chuckie bird”	?
23	www.oaktreepoultry.co.uk/our_birds.html Oak Tree Poultry Website. “hen bird”, “cock bird”, “cock”, “hen”	Domestic fowl
24	www.guardian.co.uk/g2/story/0,,1757089,00.html <i>The Guardian</i> . “Wyandotte hen”	Wyandotte chicken (domestic fowl)
25	www.nativebirds.co.uk/index.php?option=com_content... Website on small native birds. “hen bird”, “hen”, “cock bird”, “cock”, “chicks”	Redstart
26	www.nativebirds.co.uk/index.php?option=com_content... Website on small native birds. “hen bird”, “hen”, “cock bird”, “cock”, “chicks”	Wheatear
27	www.nativebirds.co.uk/index.php?option=com_content...	Bramble finch

	Website on small native birds. “hen bird”, “hen”, “cock bird”, “cock”, “chicks”	
28	www.nativebirds.co.uk/index.php?option=com_content... Website on small native birds. “hen bird”, “hen”, “cock bird”, “cock”, “chicks”	Blackcap
30	pets.oodle.co.uk/detail/hans...hen-bird/3265886170-hull-ery-en/ “*Hans Macaw hen bird”	Hahn’s Macaw (parrot)

Table 20: Search “hen bird”

These results show that “cock-bird” and “hen-bird” can be used in three possible ways: first, they can be used alone (“the cock-bird”, “the-hen bird”), second they can be added after the full noun or expression denoting the animal species (“pheasant cock bird” in result n°4, “Derbyan parakeet cock bird” in result n°12), and finally they can partly replace it (for example in result n°2, “African Grey hen bird”, “hen-bird” replaces “parrot”, and in result n°22, “blue pennant cock-bird”, “cock-bird” replaces “parakeet”).

In many cases, “cock-bird” and “hen-bird” are used alternately with “cock” and “hen”, which confirms that they are generally interchangeable, except that “cock” and “hen” can also be placed before the noun denoting the particular animal species (“hen budgie”, result n°21), which is not the case of “cock-bird” and “hen-bird”. What is interesting too is that the noun “chick” (which will be studied in further detail later on) is often used together with “cock”/“cock-bird” and “hen”/“hen bird”, whatever the bird species is. This suggests that the three categories [COCK], [HEN] and [CHICK] form a coherent “family” in the speakers’ mind: the animal species they can refer to are similar, probably because they are understood against similar ICMs.

The animal species denoted by “cock-bird” and “hen-bird” are extremely various. Of course, the domestic fowl is very well represented (“cock bird” results n°11, 18, 24, 28; “hen bird” results n°1, 3, 4, 23, 24) and, to a lesser extent, the bird species which are perceived as similar to it (birds of similar size, shape and colour, with similar beaks etc.), for instance the pheasant or the red grouse. More surprisingly, small birds (like finches, redstarts, canaries...) are also very present, and exotic species even more (many parrots and parakeets), although their common points with the domestic fowl are not obvious (their size, colour, beaks and legs are different, as well as the way they fly, the noise they make or the place they generally live in). In French, by contrast, speakers would most probably not use the nouns “coq” and “poule” to refer to a finch or a parrot (but rather the adjectives “mâle” and “femelle”), which

shows that the categories [COQ] and [POULE] are not as extended as in English, although their centres are the same.

Most of the time, “cock”/”cock-bird” and “hen”/”hen-bird” can be found together in the same context, to refer to the male and female of a same species. But is “cock” always used exactly in the same way as “hen” (and reversely)? Do both categories have the same organization, with the same members and the same degrees of centrality? Here are some numbers of results obtained from a series of complementary Google searches (March 2013):

- “cock sparrow” gives 6,570 results and “hen sparrow” only 878, which suggests that the sparrow is a more central member to [COCK] than to [HEN]. On the other hand, “sparrow”+”the hen” gives 1,320,000 results and “sparrow”+”the cock” 877,000, which indicates that the way the noun is used (either alone, or together with the name of the species) also needs to be considered...
- “cock oyster” gives 42 results, but “hen oyster” 2,390, which may suggest that crustaceans and shells are more central to [HEN] than to [COCK]. Contrary to bird species, in which little difference can be observed between the use of “cock” and the use of “hen”, animals living under water are apparently more frequently denoted by “hen” than by “cock”.
- “gorcock” gives 25,300 results and “gorhen” 14,300, which shows that even if it is an integral part of another noun, “cock” can still be replaced by “hen”. But this does not work in all cases: while “peacock fish” gives 2,840 results, “peahen fish” gives only 1, which shows that it is virtually not used. It seems that the distinction between the sexes (which is still taken into account when the peacock is extended from the cock) is no longer important in the motivation from the peacock to the peacock fish. Likewise, “woodcock” gives 1,680,000 results and “woodhen” 5,030 results (which is quite significant), but “sea woodcock” gives 238 results and “sea woodhen” 0.

2. “Bull” and “cow”

a. Definition

<i>OED</i> 2012, entry “bull”	<i>Grand Robert</i> 2012, entry “taureau”
-------------------------------	--

<p>“The male of any bovine animal; most commonly applied to the male of the domestic species (<i>Bos Taurus</i>); also to the buffalo, etc.”</p>	<p>“Mammifère ruminant domestique (<i>Bovidés</i>), mâle non castré de la vache. ”</p>
<p>“The male of certain other large animals, as the elephant, alligator, whale, etc.”</p>	
<p>“In sense of ‘male’. (Sometimes hyphenated.)”</p> <p>[Quotations]</p> <p>[...]</p> <p>1861 P. B. Du Chaillu <i>Explor. Equatorial Afr.</i> xii. 170 We saw..a..bull-elephant.</p> <p>1863 <i>Spring in Lapland</i> 185 Certainly a bull elk is an awkward customer when brought to bay.</p> <p>1880 <i>Daily News</i> 8 Dec. 6/7 One bull whale..measured 48 ft.”</p>	

Table 21: Definitions of "bull" and "taureau"

<p><i>OED</i> 2012, entry “cow”</p>	<p><i>Grand Robert</i> 2012, entry “vache”</p>
<p>“The female of any bovine animal (as the ox, bison, or buffalo); most commonly applied to the female of the domestic species (<i>Bos Taurus</i>)”.</p>	<p>“Femelle du taureau, mammifère (<i>bovidés</i>) ”</p>
<p>“The female of certain other large animals, e.g. elephant, rhinoceros, whale, seal, etc., the male of which is called a <i>bull</i>.”</p>	<p>“Par anal. (autres animaux). Vache marine → Dugong (→ 1. Morse, cit.). Vache de mer.”</p>
<p>“<i>attrib.</i> In sense of “female”, “she-“</p> <p>[Quotations]</p> <p>[...]</p> <p>1839 <i>Knickerbocker</i> 13 386 An enormous cow-whale rose close beside her wounded offspring.</p> <p>1863 <i>Spring in Lapl.</i> 184, I saw a magnificent cow elk quietly walking up the mountain-side.</p> <p>1880 G. W. Cable <i>Granddissimes</i> xxviii. 237 In dimmer recesses the Cow alligator, with her nest hard by.</p> <p>1946 T. M. Stanwell-Fletcher <i>Driftwood Valley</i> 194 When the cow moose is alarmed, it is not uncommon for her to desert her calf.”</p>	

Table 22: Definitions of "cow" and "vache"

The categories [BULL] and [COW] have very similar members, with similar degrees of centrality. The domestic bovine species (*Bos Taurus*) is quite clearly the prototypical member of both categories, which also include other bovine species (bison, buffalo, etc.); the use of “bull” and “cow” is then extended to other animals (whale, seal, alligator, elephant, rhinoceros...). These animals are visibly very different from one another: their environment, overall shape and size have nothing in common, and scientifically speaking, they belong to

very different biological groups (mammals, but also reptiles for instance): hence the motivation link connecting all of them to bovines is not obvious. It may be based on a perceived similarity in size: indeed, it seems that all animals referred to as “bulls” and “cows” are considered as similarly “large”. This may appear strange since objectively a whale is considerably bigger than a cow, or a seal. On the other hand, it is worth noticing that, among the various species mentioned, no animal is smaller (even slightly smaller) than bovines, which means that there is still a form of coherence in extensions: only animals as big as, or bigger than the central case can be extended from it.

“Bull” and “cow” can be used, either before the noun denoting the animal species (“cow alligator”, “bull elephant”) or instead of it (only if the specific animal species has been mentioned before in the context). Otherwise it refers by default to the central case, *Bos Taurus*.

In French, “taureau” and “vache” mostly refer to the domestic bovine species. Apparently they are not used for any other species, even of the bovine kind. The only exception is “vache de mer”, which is used by analogy to designate the dugong (as “éléphant de mer”, by the way, is used to designate the elephant seal). However, it does not follow that “taureau” and “vache” are used for the male and female of this species.

b. Google search

The search “bull” on Google (February 2013) generated a lot of waste. Here are the few cases in which it designated an animal:

N°	Website address and description:	Animal species referred to:
9	www.britishmuseum.org/.../gr/b/minoan_bull_and_acrobat.aspx Website of the British Museum. “bull-jumping is frequently shown in Minoan art”	Domestic bovine species.
16	www.britishmuseum.org/.../bronze_of_the_king_before_bull.aspx Website of the British Museum. Bronze statuette representing a bull, a sacred animal in Egypt	Domestic bovine species
28	kalsar.btweb.co.uk/ Website of a Bull Terrier owner.	Bull Terrier (dog)
30	www.dailymail.co.uk/.../Newborn-mauled-death-family-pit-bull-police-Texas-home-911-domestic-disturbance.html Newspaper article about a pit bull attack.	Pit bull (dog)

Table 23: Search “bull”

These results seem to confirm that the *Bos Taurus* is central to the category [BULL]. Besides, it is interesting to notice that “bull” can also be part of the name of certain species of dogs (results n°28 and 30), but in such cases, “bull” and “cow” are not used to refer to the male and female. These dogs have very few common points with bovines and are much smaller than them, which suggests that similarity does not play an important role here. Instead, their names come from the historical fact that these dogs were originally bred to bait bulls in pits (Wikipedia article on the “American Pit Bull Terrier”, May 2013): in fact, at that point of history, this specific breed of dog was part of the same “domain of experience” as the bull, which is why it got its name. This illustrates the importance of experience in language categorization and is strangely evocative of the first principle of Dyrbal categorization mentioned by Dixon (see the first chapter), which explains for instance why some spears, being fishing implements, are included into the same category as fishes.

The search “cow” (Google, February 2013) generated a lot of waste too. The remaining results, detailed below, overwhelmingly refer to the female of the *Bos Taurus*.

N°	Website address and description:	Animal species referred to:
5	www.goodfoodnation.co.uk/cow-nation.php “Cow Nation – British Milk for Animal Lovers”, “a dairy model which enables each cow to live out its full natural life along with all their offspring”	Domestic bovine species
6	wellcow.co.uk/ A device used by farmers, “allowing optimisation of nutrition management for cows to improve their health and welfare”	Domestic bovine species
7	www.sendacow.org.uk/ Charity which gives cows to African families to help them out of poverty.	Domestic bovine species
13	www.winacow.org.uk/ Charity which gives cows to African families to help them out of poverty.	Domestic bovine species
14	www.guardian.co.uk/science/2012/.../gm-cow-milk-allergy-protein Newspaper article about a “GM cow designed to produce milk without an allergy-causing protein”	Domestic bovine species
21	www.bbc.co.uk/news/health-19785006 “GM cows make low allergy milk”	Domestic bovine species
22	www.dailymail.co.uk/sciencetech/.../Cows-best-friends-stressed-separated.html Newspaper article about a recent discovery, “cows have best friends and get	Domestic bovine species

	stressed when they are separated”	
29	www.dairyco.org.uk/technical-information/animal.../cow-tracks/ “Cow tracks [...] enabling cows to access grazing areas”	Domestic bovine species

Table 24: Search "cow"

The complementary searches of “cow whale” / ”bull whale” / ”whale”+”the cow” / ”whale”+”the bull”, and so on with all the species mentioned in the *OED* entry (Google, May 2013), confirmed that “bull” and “cow” are indeed used for all these species (with generally several thousands of results obtained).

3. “Dog” and “bitch”

a. Definition

<i>OED</i> 2013, entry “dog”	<i>Grand Robert</i> 2013, entry “chien”
“A domesticated carnivorous mammal, <i>Canis familiaris</i> (or <i>C. lupus familiaris</i>), which typically has a long snout, an acute sense of smell, non-retractile claws, and a barking, howling, or whining voice, widely kept as a pet or for hunting, herding livestock, guarding, or other utilitarian purposes.”	“Mammifère domestique (<i>Carnivores; Canidés</i>), d'une espèce dont il existe de nombreuses races [...] élevées pour remplir certaines fonctions auprès de l'homme ;”
“As a way of distinguishing sex: a male dog, as opposed to a female one; contrasted with bitch.”	“spécialt, mâle (opposé à <i>chienne</i>) et adulte (opposé à <i>chiot, petit</i>) de cette espèce.”
Also: a male of various other carnivorous mammals, as the fox, wolf, bear, ferret, or seal.	“Chien de mer : squal. → Aiguillat ; roussette.
With names of members of the dog family, and of some other carnivorous mammals: male; as dog hound, dog otter, dog seal, etc. See also dog-fox, dog-wolf. > Dog-fox. “A male fox (the red fox, <i>vulpes vulpes</i>)”. (<i>OED</i> 2013, entry “dog-fox”) > Dog-wolf. “A male wolf” (<i>OED</i> 2013, entry dog-wolf”)	Chien-dauphin. → Lamie.”

Table 25: Definitions of "dog" and "chien"

<i>OED</i> 2013, entry “bitch”	<i>Grand Robert</i> 2013, entry “chienne”
--------------------------------	---

“The female of the dog.”	“Femelle du chien”
“The female of the fox, wolf, and occasionally of other beasts; usually in combination with the name of the species.”	

Table 26: Definitions of "bitch" and "chienne"

In English as in French, “dog” and “chien” can designate both the species *Canis familiaris* and the male of this species; “bitch” and “chienne” denote the female.

In French, “chienne” denotes no other animal species; as for “chien”, it can also refer to species of sharks, but only in compounds like “chien de mer” and “chien-dauphin”. By contrast, the English categories [DOG] and [BITCH] contain much more members. They may be radial categories: their central subcategory is clearly the domestic species, from which the wolf and the fox are extended (because they are in the same family, *Canidae*). Then, a wide range of similarly wild, “carnivorous” species are extended from the wolf and the fox: the bear, the otter, the seal... “Dog” and “bitch” can either be used alone, or in combination with the name of the species.

b. Google search

In each one of the twenty-seven relevant results obtained from the search “dog” on Google (May 2013), the noun designates the *Canis familiaris* (generally without regard to sex, and often without specifying the breed). As expected, the search “bitch” (May 2013) gives no relevant results, except one, n°29, in which it refers to the female of the dog (www.guidedogs.org.uk/.../brood-bitch-holders-raise-...).

“Dog wolf” gives 12,100 results, “bitch wolf” 904, “dog fox” 33,100 and “bitch fox” 1,370 (May 2013), which confirms that they are widely used. Interestingly enough, species like the coyote and the jackal give fewer results, although they are in the exact same family as the dog, the wolf and the fox (May 2013, “dog coyote”: 5,680, “bitch coyote”: 26, “dog jackal”: 1,030, “bitch jackal”: 2); the number of results is particularly low for “bitch”, which shows that it is virtually not used to denote the female of these species. Perhaps paradoxically, species which are less similar to dogs and *Canidae* give more results (May 2013, “dog otter”: 13,300, “bitch otter” 1,170, “dog seal”: 12,800, “bitch seal” 48, “dog bear” 13,000 and “bitch bear” 756), although “bitch” is always used less than “dog”. In fact, similarity is important in motivation: it explains why wolves and foxes, which are *Canidae*, are more central to the categories [DOG] and [BITCH], and why the other members are generally wild and

carnivorous like them. But similarity does not systematically motivate extensions; indeed, it should not be considered as a general principle that, the more similar to the dog an animal species is, the more central to the category it will be.

4. “Tom”

The following tables confront the definitions of “tom” and “chat” in the *Oxford English Dictionary* and in the *Grand Robert de la langue française*.

<i>OED</i> 2013, entry “tom”	<i>Grand Robert</i> 2013, entry “chat”
	“Petit mammifère familial à poil doux, aux yeux oblongs et brillants, à oreilles triangulaires, se nourrissant de petits animaux (traditionnellement, de souris qu’il aime à chasser) et de la nourriture que ses maîtres lui servent ;”
“The male of various beasts and birds; perh. first for a male cat: see tom cat.” > Tom cat, tom-cat : “A male cat” (<i>OED</i> 2013, entry “tom cat”)	“spécialt, le mâle (→ Matou) adulte.” > Matou : “Chat domestique mâle et entier” (<i>Grand Robert</i> 2012, entry “matou”)
“Tom-hoop” > Hoop : “A local name for the Bullfinch” (<i>OED</i> 2013, entry “hoop”) “Tom-noup [...] <i>dial.</i> the great tit (<i>Parus major</i>)” “Tom-pot (also Tompot), name in Cornwall for the gattorugine, a species of blenny; in Devonshire, for the guinea-fowl” “Tom-pudding, the little grebe” “Tom-tailor, the crane-fly; in East Anglia, the stormy petrel.”	“ Zool. (par référence aux moustaches du chat). <i>Chat marin</i> : espèce de phoque. <i>Poisson chat.</i> ”

“Tom Titmouse = tom-tit”	
--------------------------	--

Table 27: Definitions of "tom" and "chat"

As a complement to the *OED* definition, the definition of “tom” in the *Free Dictionary* (2013) is the following: “a. The male of various animals, especially a male cat or turkey. b. (*as modifier*) a tom turkey”

In fact, while “chat” in French refers to the male of only one species (and above all to this species in general, including the female), “tom” refers to the male of a wider variety of species.

The cat is apparently the centre of the category [TOM] but it contains many other members, including various bird species (for example the tit, or the turkey, which is mentioned in the *Free Dictionary*). The link between the cat and these birds is quite enigmatic. Moreover, another word exists to refer to the male of the turkey, for instance, which is “cock” (and it may appear as more logical, since the turkey is physically closer to the domestic fowl than to the cat). And yet, when I compare the number of results obtained from the searches “tom turkey” and “turkey cock” (Google, May 2013), the latter gives 17,900 results, while the former gives 49,500, which indicates that it is more frequently used.

Interestingly enough, it appears that “tom” (contrary to “cock” or “bull”, for instance, which work in pairs with “hen” and “cow”), has no female counterpart. “Molly” was found in the “List of animal names” on Wikipedia, as the female of the cat. Nevertheless, there is no entry in the *Oxford English Dictionary* or in the *Free Dictionary* corresponding to this definition of “molly”, and the Google searches “molly cat” and “cat”+“the molly” (May 2013) gave 0 relevant results (“Molly” was indeed used for female cats, but as a proper name, often with a capital letter), which suggests that this noun is actually not concretely used.

Finally, “tom” is also used in compounds which refer to species in general (without regard to sex): these species are birds, either small (the bullfinch, the great tit) or large (the stormy petrel, the little grebe, the guinea-fowl), but also fishes (the gattorugine) and even insects (the crane-fly). Interestingly enough, the French noun “chat” is also used as an element in the names of some other species (“chat marin” for a seal, “poisson chat” for a fish), but they are less diverse and numerous. Besides, these species have “chat” in their name for only one reason, which is that they have whiskers like cats. In English, by contrast, it appears

to be much more complex: direct similarity is not as important a criterion in the link connecting the tom cat to other species.

5. “Boar” and “sow”

a. Definition

<i>OED</i> 2013, entry “boar”	<i>Free dictionary</i> 2013, entry “boar”	<i>Grand Robert</i> 2013, entry “porc”
“The male of the swine, whether wild or tame (but uncastrated)”	“1. a. An uncastrated male pig. b. The adult male of any of several mammals, such as the beaver, raccoon, or guinea pig. 2. The wild boar.”	“Mammifère ongulé omnivore (Suidés), animal au corps épais, dont la tête est terminée par un groin, qui est domestiqué et élevé pour sa chair, spécialt le mâle adulte.” “Par ext. Animal de la famille des suidés (pécari, phacochère). – Porc sauvage → Sanglier. ” “Composés (Du même rad.) Porc-épic. ”

Table 28: Definitions of “boar” and “porc”

<i>OED</i> 2013, entry “sow”	<i>Free Dictionary</i> 2013, entry “sow”	<i>Grand Robert</i> 2013, entry “truie”
“The female of swine; an adult or full-grown female pig, esp. a domestic one used for breeding.”	a. An adult female hog. b. The adult female of several other animals, such as the bear.	“Femelle du porc, du verrat” “ <i>Truie de mer</i> : scorpène”

Table 29: Definitions of “sow” and “truie”

In French, the domestic pig is quite clearly the centre of the categories [PORC] and [TRUIE]. Some other animal species which belong to the same family (especially the peccary and the wart hog) can be denoted by “porc”, but apparently not by “truie”. Besides, “porc sauvage” can be used to refer to the wild boar, but apparently not “?truie sauvage”. This suggests that the two categories do not have the exact same members. While [PORC] has a prototypical member, the domestic swine, plus other, more marginal members which are considered as similar to it, [TRUIE] is apparently more restricted: the domestic swine is its only member (except in the expression “truie de mer”, which refers to a species of fish, without regard to sex).

In English, it appears as slightly more complex. To begin with, the centre of the categories [BOAR] and [SOW] is not as clear as in French. According to the *Oxford English Dictionary*, “boar” can equally refer to the domestic or wild species, whereas “sow” especially refers to the domestic species. According to the *Free Dictionary*, on the contrary, “boar” denotes above all the domestic pig and secondly the wild boar, whereas “sow” can refer to any hog. In fact, in one case the centre of the category is the domestic pig, and the wild species are extended from it (hence they are more marginal members); in the other case, the centre contains all swine, without any clear difference of centrality between the domestic and wild species. As for the other members included in the category [BOAR] and [SOW], it is not much clearer. The *Free Dictionary* mentions completely different animal species in “boar” (beaver, raccoon, guinea-pig) and in “sow” (bear); as for the *Oxford English Dictionary*, it does not mention any of them.

b. Google search

The first thirty results of the search “sow” (Google, May 2013) did not refer to animals (“sow” was often used as a verb). As for “boar”, in all the relevant results obtained (Google, May 2013), it did not appear alone, but directly in the expression “wild boar”, which gives little information about the potential members of the category [BOAR].

Among the first thirty results obtained from the searches “boar raccoon”/“raccoon boar”, “sow raccoon”/“raccoon sow”, “boar beaver”/“beaver boar” and “sow beaver”/“beaver sow” on Google (May 2013) no relevant results could be found, which suggests that beavers and raccoons may after all not be members of the categories [BOAR] and [SOW].

On the contrary, “boar guinea pig”/“guinea pig boar” and “sow guinea pig”/“guinea pig sow” (May 2013) all gave excellent results: in thirty results out of thirty, these expressions refer to the male and female guinea-pig, most of the time in specialized forums on guinea-pigs, or in websites where they are sold; when “sow” and “boar” are placed after “guinea pig”, it is often because it is preceded by another word (“baby guinea pig boar”, “Teddy guinea pig boar” etc.), otherwise it is placed before. Thus, guinea-pigs are clearly members of both categories [BOAR] and [SOW], although they are not physically similar to pigs. French speakers, by contrast, would not use “porc” or “truie” to refer to a guinea-pig, although the species is also called “cochon d’Inde”.

Finally, “sow bear” and “bear sow” (May 2013) gave the following relevant results:

N°	Website address and description:
6	www.telegraph.co.uk › ... › North America › USA Newspaper article on a bear attack. “the sow bear”
10	www.guardian.co.uk › World news Newspaper article (“Grizzly killed...”). “the sow bear”
16	uk.answers.yahoo.com › ... › Zoology Forum. “a sow bear with cubs”
18	www.songofthepaddle.co.uk › ... › General › General Forum. “a big sow bear and two youngsters”
23	www.tripadvisor.co.uk › ... › Alaska travel forum Travel website (about Alaska). “a sow bear and 3 cubs”
27	www.amazon.co.uk/Polar-bear.../dp/B009DYFFRC Description of a photograph representing a polar bear. “sow jumping”
28	www.authorhouse.co.uk/.../BookDetail.aspx?BookId... Excerpt of a book. “a sow bear looking for her cub”
30	www.bushcraftuk.com/forum/showthread.php?t... Forum. “a large blackbear sow and three cubs”, “the sow”

Table 30: Search "sow bear"

N°	Website address and description:
1	www.amazon.co.uk › ... › Jigsaws & Puzzles › Jigsaws Description of a photograph. “Grizzly bear”, “sow with cub”
3	www.allposters.co.uk/-.../Brown-Bear-Sow-with-Cubs... Description of a poster. “Brown Bear sow with cubs”
4	www.zazzle.co.uk/brown_bear_grizzly_bear_sow_an... Description of a picture. “Grizzly bear”, “sow and cubs”
15	www.cafepress.co.uk/+grizzly_bear_sow_and_cub_fl... Description of a picture. “Grizzly bear”, “sow and cub”
17	www.tripadvisor.co.uk › ... › Things to Do in Haines Travel website. “Brown bear sow fishing”
18	www.posterlounge.co.uk/alaskan-brown-bear-sow-an... Description of a poster. “Brown bear sow and three cubs”
23	www.gettyimages.co.uk/...bear-sow.../160869541 Description of a photograph. “Brown bear sow and cubs”
24	www.gettyimages.co.uk/...bear-sow.../128143769 Description of a photograph. “Brown bear with cub fishing in Brooks River”
26	www.dailymail.co.uk/.../Alaskan-forester-mauled-dea... Newspaper article entitled “Alaskan forester mauled to death by brown bear”. “a brown bear sow bith two cubs”

27	www.tripadvisor.co.uk › ... › Kodiak Island › Kodiak Travel website. “brown bear sow”
30	www.art.co.uk/.../brown-bear-sow-with-cubs-alaska-p... Description of a photograph. “brown bear sow with cubs”

Table 31: Search "bear sow"

These results prove that bears are members of the category [SOW]. The noun “sow” is generally placed before “bear”, except when it is preceded by another word (“brown bear sow”); it can also be used alone, when the bear has already been mentioned before (“the sow”, result n°30 in the first table).

On the other hand, among the first thirty results obtained from the search “boar bear” on Google (May 2013), none was relevant. As for “bear boar” it gave only three relevant results, which are the following:

N°	Website address and description:
12	www.tripadvisor.co.uk/LocationPhotoDirectLink-g14... Travel website. “brown bear boar roaming past the lodge”
13	www.zazzle.co.uk/grizzly_bear_boar_iphone_4_4s_c... Description of a photograph. “grizzly bear boar”
19	www.cafepress.co.uk › Wall Art › Posters Description of a poster. “young Polar Bear boar rolling around in the snow”

Table 32: Search "bear boar"

This may suggest that “sow” is more often used for female bears than “boar” for male bears, which confirms that the two categories [BOAR] and [SOW] do not exactly have the same members, with the same degrees of centrality.

6. “Jack” and “jenny”; ”jack” and “gill”/“jill”

a. Definition

<i>OED</i> 2013, entry “jack”
“Applied to the male of various animals” - “A male hawk, <i>esp.</i> merlin” - “(Short for jackass) A male ass, <i>esp.</i> one kept for breeding mules. <i>U.S.</i> ”
“Short for jack-rabbit” > Jack-rabbit : “Short for <i>jackass rabbit</i> [...] <i>U.S.</i> One of several species of large prairie-hares (<i>Lepus campestris</i> , <i>L. callotis</i> , etc.) with remarkably long ears and legs” (<i>OED</i> 2013, entry “jack-rabbit”)

“Name for various birds.”

- “Short for jackdaw, *jack curlew* at Compounds, Cornish jack, the Cornish chough, jack snipe.”

> **Jackdaw:** “a. The common name of the daw (*Corvus monedula*), one of the smallest of crow family [...] b. A species of grackle or ‘blackbird’ (*Quiscalus major*) of the Southern United States” (OED 2013, entry “jackdaw”)

> **Jack snipe:** “A small species of snipe, *Scolopax (Gallinago) gallinula*; also called half-snipe. Also applied to the common American or Wilson’s snipe, *Gallinago Wilsoni*, the Dunlin, *Tringa alpina* (Shetland), and the pectoral sandpiper of N. America, *Tringa maculata*.” (OED 2013, entry “jack-snipe”)

- “As the second element in various names, as *curlew-jack*, [...], *whisky-jack*.”

> **Whisky-jack:** “A popular name for the common grey jay of Canada, *Perisoreus canadensis*.” (OED 2013, entry “whisky-jack”)

- “*Austral*. A laughing jackass, a kookaburra”

“Name of various fishes, etc.”

“a. A young or small pike; also sometimes used generically as a name for the pike.”

“b. Also applied to several American fishes: as the pike-perch, *Stizostedion vitreum*; a scorpaenoid fish, *Sebastes paucispinis*; several carangoid fishes, esp. *Caranx pisquetos* and *Seriola carolinensis*; and the pompano, *Trachynotus carolinus*.”

“c. With defining word [...] buffalo-jack, the *Caranx pisquetos* (also called simply jack) [...] five-fingered jack: popular name in U.S. for a starfish [...] goggle-eyed jack: see goggler [...] history-jack (a) the *Caranx pisquetos* or one of several other carangoid fishes; (b) the hickory-shad, *Pomolobus mediocris*.”

“Compounds. In names of animals (sometimes signifying *male*, sometimes *small*, *half-sized*)”

“a. Denoting the male of certain animals”

(a)

“jack-ape”

“jack-fly”

(b) “*esp.* of falcons”

“jack-hobby”

“jack-kestrel”

b.

“jack-crow”, “a name for *Picathartes gymnocephalus*, a West African corvine bird”

“jack curlew”, “a name for two small species of curlew: (a) the Whimbrel, *Numenius phaeopus*; (b) the *N. hudsonicus* of North America.”

<p>“jack-fish”, “a name for the pike; also for <i>Caranx pisquetos</i> and other carangoid fishes”</p> <p>“jack-in-a-bottle”, “a name for the long-tailed titmouse, also called <i>bottle-tit</i>, from the shape of its nest.”</p> <p>“jack mackerel”, “any of several game fishes of the genera <i>Trachurus</i> and <i>Caranx</i> (family <i>Carangidae</i>)”</p> <p>“Jack Russell”, “a small terrier named after John Russell”</p> <p>“jack salmon”, “<i>U.S.</i> a large freshwater fish, <i>Stizostedion vitreum</i>, also called walleyed pike”</p> <p>“jack-saw”, “a name for the Goosander, <i>Mergus merganser</i>”</p> <p>“jack-sharp”, “a northern dialect name for the stickleback”</p> <p>“jack-spaniard”, “a large species of wasp found in the West Indies”</p>

Table 33: Definition of "jack"

OED 2013, entry “jenny”
“a. Used as a prefix to denote a female animal, as jenny-ass, and esp. in names of birds, as jenny-hooper, jenny-howlet, and sometimes loosely applied without reference to sex.”
“b. Short for jenny-ass, jenny-wren.”

Table 34: Definition of "jenny"

In English, the male and female of the donkey are called “jack” (or “jack-ass”) and “jenny” (or “jenny-ass”), but these two words also denote other animal species, especially birds. There is no such category in French. For example, “âne” and “ânesse” refer to no other animal species than the donkey (*Grand Robert* 2013, entry “âne” and “ânesse”); as for male and female birds (the wren, or the hawk for instance), there is most often no specific noun to designate them (the only way generally consists in adding an adjective, “mâle” or “femelle”).

Contrary to other categories like [COCK] and [HEN] or [COW] and [BULL] for example, there is no single animal species which imposes itself as the clear centre of the English categories [JACK] and [JENNY]. [JENNY] includes both the donkey and some species of birds: once again, the link between these very different members appears to be quite mysterious. Likewise, the category [JACK] includes the donkey, together with some birds of prey (owls in [JENNY], and hawks in [JACK]). However, the members of [JACK] are visibly much more numerous and diverse (mammals, birds, fishes...) than those of [JENNY]. This illustrates that, although two nouns can form a “couple” for the male and female of a specific species, it does not prevent them from functioning independently as far as other species are concerned.

“Jack” denotes the male hawk and the male ass, but it is also used to refer to certain species in general (without reference to sex), especially several species of birds, of fishes, and the jack-rabbit. Finally, for some species like the pike, it can refer to a young or small-sized animal (again, without reference to sex). In fact, “jack” can be understood in at least three possible senses. This is also true when “jack” is used in compounds, in which it can refer to male animals, small animals, or species in general (many different birds, fishes, and even insects). Hence, to give an account of the organization of such a category seems to be particularly difficult.

Moreover, while “jack” can be used together with “jenny” to denote the male and female of a species, it can also be used together with “jill” (also written “gill”), whose definition is the following:

OED 2013, entry “gill / “jill”
A female ferret, polecat, or weasel. <i>colloq.</i> or <i>dial.</i>

Table 35: Definition of "gill/jill"

Additionally, in the Wikipedia article “List of animal names”, “jack” and “jill” are said to be the male and female of the hare, the kangaroo, the opossum, the rabbit, the wallaby, the weasel and the wombat.

In fact, the categories [JENNY] and [JILL] do not contain the same members at all, although it appears that each of them can be used with “jack” to form a couple of animals. The category [JILL] seems to be slightly more coherent than [JENNY], because it includes members which are all mammals, whose size is quite comparable and which sometimes share common points (for instance the shape of the ears, as far as hares, rabbits, wallabies and kangaroos are concerned). The definition of the *Oxford English Dictionary* may suggest that species like the ferret, the polecat and the weasel (from the family *Mustelidae*) are central members in the category [JILL], but it remains unclear. Besides, these species were not mentioned at all in the definition of “jack”, which should be the male counterpart of [JILL].

b. Google search

The four searches “jack”, “jenny”, “jill” and “gill” on Google (May 2013) gave no relevant results among the first thirty ones: most often, these nouns were used as first names and did not refer to any animal species at all.

“Jack ape”, “jack fly”, “jack hobby” and “jack kestrel” (Google, May 2013) did not prove more successful. “Jack pike” (Google, May 2013), by contrast, appears to be quite widely used (often in fishing websites, to refer to a small pike, as indicated in the *Oxford English Dictionary*).

“Jenny wren” gave 91 400 results, but out of the first thirty ones, none referred to an animal. As for “jenny howlet”, a few relevant results appeared, but they often mentioned “jenny howlet” as one of the old names no longer used to refer to the animal species currently named “barn owl”; interestingly enough, some other old names mentioned were “gillihowlet” or “gill howter”, which suggests that in the past, “jenny” and “jill” could denote the same animal species, although it is no longer true today.

Out of the thirty results obtained from the search “weasel”+“the jill”, these are the results in which “jill” referred to an animal:

N°	Website address and description:	Animal species referred to:
1	www.britishblades.com/.../showthread.php?...Weasel... Forum. “the jill”(female) “the hob”(male)	Weasel and stoat
5	www.keldale.f9.co.uk/tabularasa/vys3.htm Excerpt of a book. “the jill”	Weasel
10	forums.pigeonwatch.co.uk › ... › Country Sports Forum. “the jill”, “the hob”	Ferret
12	www.angoraferret.co.uk/faq/faq.html Website about ferrets. “the jill”	Ferret
13	www.independent.co.uk/.../lovely-little-nippers-1179... Newspaper article about ferrets. “the jill”, “the hob”	Ferret
14	www.falconryforum.co.uk › ... › Dogs & Ferrets Forum. “the jill”, “the hobs”	Ferret
15	theflamingferret.info › ... › Forums › General Forum. “the jill”	Ferret or polecat.
18	www.thehuntinglife.com/forums/topic/...a.../page-2 Forum. “the jill”	Ferret
23	www.reptileforums.co.uk › ... › Other Pets and Exotics Forum. “a ferret jill”, “the jill”	Ferret
24	www.reptileforums.co.uk › ... › Other Pets and Exotics Forum. “the jill”	Ferret
26	www.dalswildlifesite.com/thebrownhare.htm Webpage about brown hares. “jill” (female), “jack” (male)	Brown hare
28	forums.pigeonwatch.co.uk › ... › Country Sports	Ferret

	Forum. “the jill”	
30	www.bbc.co.uk/dna/mbsn/html/F10211074?thread... Forum. “the jill”, “the hobs”	Weasel and stoat.

Table 36: Search “weasel”+“the jill”

These results confirm that “jill” can indeed designate weasels (and stoats, which are animals from the same family), but the high number of results in which it refers to ferrets may suggest that they are more central members in the category. Result n°26 also confirms that “jill” can refer to a female hare: in this case, “jack” refers to the male. But most often, at least as far as ferrets and similar species are concerned, the noun used as the male equivalent of “jill” is clearly not “jack”, but “hob”, which indicates that these animal species are members of the category [JILL] but not of the category [JACK].

The search “polecat”+“the jill” (Google, May 2013) gives very similar results: “jill” is used, either alone (“a jill”) or not (“a polecat jill”), to refer to female polecats, while males are referred to as “hobs”; in several results, “jill” also refers to female ferrets.

Out of the first thirty results obtained from the search “rabbit”+“the jill” (Google, May 2013), “jill” refers to a female rabbit only once, in an article from the *Lancashire Telegraph*, (www.lancashiretelegraph.co.uk/.../10340891.Thumpi...), in which “jack” refers to the male. Again, a great many of results point to ferrets instead.

As for the searches “kangaroo”+“the jill” and “kangaroo”+“the jack” (Google, May 2013), they gave no relevant results, neither in websites from the United Kingdom, nor from Australia, which suggests that kangaroos may not be members (or very marginal members) of the categories [JACK] and [JILL], contrary to what had been said on Wikipedia.

7. “Buck” and “doe”

a. Definition

<i>OED</i> 2013, entry “buck”	<i>Free Dictionary</i> 2013, entry “buck”
“the male of the fallow-deer”	“The adult male of some animals, such as the deer, antelope or rabbit.”
“the male of certain other animals resembling deer or goats, as the reindeer, chamois; in S. Africa (after Dutch <i>bok</i>) any animal of the antelope kind. Also the male of the hare, the rabbit (the female being	

called the <i>doe</i> , after analogy of b), and the ferret”	
“Appositive, indicating sex”: “buck-fawn”, “buck-goat”, “buck-rabbit”, “buck-rat”,	
“ <i>Austral.</i> A male kangaroo.”	

Table 37: Definitions of "buck"

OED 2013, entry “doe”	Free Dictionary 2013, entry “doe”
“The female of the fallow-deer; applied also to the female of allied animals, as the reindeer”	“The female of a deer or related animal”
“The female of the hare or rabbit; sometimes <i>dial.</i> of other animals, e.g. the rat”	“The female of various mammals, such as the hare, goat or kangaroo.”

Table 38: Definitions of "doe"

The categories [BUCK] and [DOE] have a very similar organization, with the same members and degrees of centrality.

They are most probably radial categories. The fallow-deer is the central subcategory, from which a number of species that are perceived as similar (because they have antlers or horns on their heads, like the fallow-deer) are extended: the reindeer, the chamois, the antelope... They can either be members of the same biological family (*Cervidae*), or not. Then, other animal species (the hare, the rabbit, or even the rat or the kangaroo) constitute further extensions.

Interestingly enough, “buck” and “doe” can be applied to some other deer species, but not to all of them. Indeed, in result n°24 of the Google search “deer” (detailed above), “buck” and “doe” were used for the fallow-deer, the roe deer and the Chinese water deer, but not for the red deer or the sika deer (which were referred to as “stag” and “hind”).

In French, the male and female of the fallow-deer are called “daim” and “daine” but these nouns are not extended to other species, not even in the same family. On the other hand, “cerf” and “biche” (the male and female of the red deer) can sometimes be loosely applied to several species of deer, and “biche”, in African French, can refer to an antelope (*Grand Robert* 2013, entry “biche”).

b. Google search

Except for two results which were discarded for uncertain provenance, and two other results which did not refer to animals, all results out of the first thirty ones obtained from the Google search “rabbit”+”the buck” (May 2013) used “buck” to refer to the male rabbit; besides, when the female was mentioned in the same context it was always referred to as “doe”, which shows that rabbits are important members of the categories [BUCK] and [DOE].

As for the search “rat”+”the buck” (Google, May 2013), seventeen results out of thirty (after discarding five websites from uncertain origin and eight which did not refer to animals) used “buck” to designate the male rat and, once again, also used “doe” when the female was mentioned. As in the case of rabbits, the sources are mainly discussion forums in which pet owners exchange information about their animals.

Finally, here are the relevant results obtained from the search “kangaroo”+”the buck” on Australian websites (Google, May 2013): they confirm that kangaroos are also members of the category [BUCK] and [DOE].

N°	Website address and description:	Animal species referred to:
2	www.australiamyland.com.au/.../animal_kangaroo.ht... “the buck”	kangaroo
3	www.kinrm.sa.gov.au/LinkClick.aspx?fileticket... Website on Kangaroo Island. “the buck”	fallow deer
4	www.awpc.org.au/kangaroos/farming.htm Australian Wildlife Protection Council. “the buck”	kangaroo
8	www.kangaroo-protection-coalition.com/kangaroo-ar... Kangaroo Protection Coalition. “the buck”, “a doe”	kangaroo
10	www.abc.net.au/landline/content/.../s3352145.htm Television programme. “buck”, “doe”	kangaroo
13	epress.anu.edu.au/apps/.../view/.../07.html Australian university; article about kangaroo meat. “the buck”, “a doe”	kangaroo
23	www.thegreynomads.com.au/GreyNomadTimesIssu2... Travel website. “the buck”	kangaroo
24	australianmuseum.net.au/Uploads/.../643_complete.p... “a doe kangaroo”, “the buck”	kangaroo
26	www.sambardeer.com/gallery.php Website about the Australian Sambar deer.	Sambar deer
30	www.topix.com/forum/au/.../TM82KPCNR4VJP2C86	kangaroo

Forum. “female kangaroo”, “her joey”, “the buck”	
--	--

Table 39: Search "kangaroo"+"the buck"

8. “Stag” and “hind”

a. Definition

<i>OED</i> 2013, entry “stag”
“The male of a deer, esp. of the red deer; spec. a hart or male deer of the fifth year”
“In the names of various species of the genus <i>Cervus</i> . Axis stag: an Indian deer (<i>C. axis</i>). Carolina Stag: the North American Wapiti (<i>C. canadensis</i>).”
“ <i>north. and Sc.</i> A young horse, esp. one unbroken.”
“An animal castrated when full grown. a. A bull; more fully bull stag. Now <i>dial., Sc.</i> and <i>Austral.</i> b. A boar, hog, or ram. <i>dial</i> ”
“Applied to the male of various birds. a. A cock. <i>dial.</i> Also spec. in Cock-fighting, a cock less than one year old. b. A turkey-cock of two years and upwards.”
“ <i>dial.</i> The wren”

Table 40: Definition of "stag"

<i>OED</i> 2013, entry “hind”
“The female of the deer, esp. the red deer; spec. a female deer in and after its third year.”
“(In full <i>hind-fish</i>) One of various fishes of the family <i>Serranidae</i> and genus <i>Epinephalus</i> .”

Table 41: Definition of "hind"

Contrary to “buck” and “doe”, which originally refer to a very specific species of deer, and are then extended to other species, “stag” and “hind” are used to designate the male and female of deer in general, but more particularly of the red deer.

[STAG] and [HIND] hinge around the same prototypical member (which is also the centre of the French categories [CERF] and [BICHE]): the red deer. Other species are more marginal. “Stag” can also be used for horses (when they are young) and bulls, boars or rams (when they are castrated), which may be perceived as similar species in different ways (for instance for their size, like the horse, their environment, like the boar, or their horns, like the ram). More surprisingly, several birds like the cock and the turkey are members of the category [STAG]. The link which connects these extremely various species to the male of the

red deer is often a matter of age and reproduction, more than a question of physical similarity (indeed, a stag is specifically a full-grown animal, fit for reproduction). Finally, “stag” is also used in compounds, and then refers not to the male of a species, but to this species in general (which generally belongs to the same family as the red deer). As for “hind”, its use is apparently more restricted: for example, it does not seem to be used for the female of the horse, the bull, the boar, the ram or the cock which are nevertheless referred to as “stags”. Yet, for a reason which may appear as rather obscure, “hind” can refer to various species of fishes (without reference to sex). “Cerf” and “biche”, by contrast, include fewer and less diverse members, although “biche” can be used for the antelope and “biche de mer” for the sea cucumber, but it is very rare (*Grand Robert* 2013, entry “biche”).

b. Google search

The search “stag” (Google, May 2013) generated much waste; the only two results (out of the first thirty) which were valid and referred to animals are the following:

N°	Website address and description:	Animal species referred to:
1	www.guardian.co.uk › World news › Animals Video: “a stag chases a man up a tree”	deer
22	www.telegraph.co.uk › Women › Women's Life Article from the <i>Telegraph</i> about women hunters. “a stag”	deer

Table 42: Search “stag”

As for “hind” (Google, May 2013), none of the first thirty results obtained referred to an animal.

9. “Stallion” and “mare”

a. Definition

<i>OED</i> 2013, entry “stallion”	<i>Grand Robert</i> 2013, entry “étalon”
“A male horse not castrated, an entire horse, esp. one kept for the purpose of serving mares.”	“Cheval entier destiné à la reproduction”
“transf. Applied to a male dog or sheep with reference to its use for breeding.” “stallion ass”	“(N. apposé). Reproducteur mâle (d’une espèce domestique). Âne étalon [...] Bélier étalon ; taureau étalon. – Coq étalon”

“stallion horse”	
“stallion hound”	

Table 43: Definitions of "stallion" and "étalon"

<i>OED</i> 2013, entry “mare”	<i>Grand Robert</i> 2013, entry “jument”
“The female of any equine animal (horse, mule, ass, or zebra); spec. the female of the domestic horse, <i>Equus caballus</i> .” Compounds: “mare-mule”	“Femelle du cheval”

Table 44: Definitions of "mare" and "jument"

Although their prototypical member is the horse, the categories [STALLION] and [MARE] are organized in a slightly different way.

[MARE] includes a number of similar, equine animals (horse, mule, ass, zebra...), among which the horse is the most prototypical member, probably because it is the most frequent domestic equine animal. This category visibly contains more members than the French category [JUMENT], whose only member is the horse.

As for [STALLION], it refers mainly to the male horse, but is occasionally extended to other animals (either equine animals, like the ass, or other species, like the dogs and the sheep), when these are used for breeding. Here, it is worth noticing that what motivates the extensions is not a similar physical appearance, but the function of the animal in the stock. By the way, the French category [ETALON] has a very similar structure, with the horse at the centre, and other species which are extended from it in reference to their use for breeding. [ETALON] may even contain more diverse members than [STALLION]: indeed, the French definition even mentions the cock (a bird) as an example, while the English definition only mentions mammals and quadrupeds, which are closer to the horse.

b. Google search

Except for two results discarded for uncertain provenance, all of the first thirty results obtained from the Google search “stallion” (May 2013) refer to horses. As for “mare” (Google, May 2013), none of the first thirty results is relevant (no reference to animals).

Among the first thirty results of the search “zebra”+“the mare” (Google, May 2013), six results were discarded for uncertain provenance: these are the twenty-four remaining results.

N°	Website address and description:	Animal species referred to:
1	www.ponymag.com/article/view/id/1556 <i>Pony magazine</i> . “Rare Donkra foal born in China”, his father is a donkey and his mother (“the mare”) a zebra.	zebra
2	schools-wikipedia.org/wp/g/Grevy%2527s_Zebra.htm Article on Grevy’s zebra. “mare”, “foal”	zebra
3	hitraveling.com/the-plains-zebra-of-botswana-salt-pa... Travel website. “mare”, “foal”, “stallion”	zebra
4	www.animalcorner.co.uk/.../zebra/zebra_about.html Information about wildlife. “mare”, “foal”, “stallion”	zebra
5	www.jive-pony.co.uk/film-and-television/zorse “a zorse is a cross between a zebra stallion and a horse mare”, “the mare”, “the zebra sire”	horse
6	www.pawsforwildlife.co.uk/zony.php Information on “zorses”. “the mare”, “the sire”	horse
7	www.dailymail.co.uk/.../Whats-black-white-kicks-like... Newspaper article on the “baby donkra”, a cross between a “zebra stallion” and a “jenny donkey”; “chestnut mare” (horse), “black Arabian sire” (horse)	horse
8	www.virginmedia.com/science.../hybrid-animals.php?... Article on the “zorse”, “born from a zebra stallion and equine mare”, “the mare”	horse
9	www.equinescienceupdate.co.uk/weanz.htm “zebra mares”, “the mare”, “foal”	zebra
11	darwin-online.org.uk/.../1860/1860-165-c-1861.html Darwin’s experiment. “a hybrid from a chestnut mare and male quagga”	horse
12	uk.ask.com/beauty/How-Does-a-Zebra-Reproduce “the mare”, “her foal”	zebra
13	www.h2g2.com/entry/A87781099 “mare”, “foal”, “stallion”	zebra
16	www.accidentalsmallholder.net › ... › Horses & ponies Forum. “baby zebra”, “the mare”	zebra
17	www.animalcorner.co.uk/.../zebra/zebra_grevy's.html Information about wildlife. “the mare”, “foal”, “stallion”	zebra
18	en-gb.facebook.com/IAS.is.my.../363887460373951 “the mare”, “the foal”	zebra
19	www.bbc.co.uk/earth/hi/earth_news/.../9440222.stm BBC “Earth news”. “mares”, “their foals”, “zebra foals”	horse
20	www.zebraproducts.co.uk/index.php?option=com...	horse

	Website on horses. “the mare”	
22	www.myfavouriteplanet.co.uk/.../parlanceofafrail-the... “the mare”	zebra
23	www.timeshighereducation.co.uk/106245.article “the mare”, “her first foal by a quagga”	horse
24	www.mareandfoal.org/.../NewsletterAugust-2012.pdf Charity. “mare and foal”	horse
26	www.amazon.co.uk › ... › Fiction › Animals Title of a book for sale. “the mare”	horse
28	www.horsecarecourses.com/horse_of_the.../06/ Blog. “the mare”	horse
29	www.marwell.org.uk/.../HMZStudbook2010.pdf “mare”, “stallion”, “foal”	zebra
30	news.bbc.co.uk/2/hi/science/nature/1804807.stm BBC News. “a horse has given birth to a donkey in a scientific experiment”, “the mare”, “the foal”	horse

Table 45: Search “zebra”+“the mare”

First of all, these results confirm that zebras are members of the category [MARE], like horses. Moreover, what is interesting is that “mare” is often used together with “stallion” and “foal” in reference to zebras, which suggests that they are members of the categories [STALLION] and [FOAL] as well. “Mare” and “stallion” can either be used instead, or after the noun denoting the species (result n°5: “zebra stallion”, “horse mare”).

In only one result (result n°7), “mare” goes together with “sire” to refer to the female and male of the horse.

Finally, while “mare” is visibly used for horses and zebras, it is not (or less) used for the donkey, which is rather a member of the categories [JACK] and [JENNY] (in result n°7, “chestnut mare” vs. “jenny donkey”).

10. “Sire” and “dam”

a. Definition

<i>OED</i> 2013, entry “sire”	<i>OED</i> 2013, entry “dam”
“A male parent of a quadruped; esp. a stallion. Correlative to <i>dam</i> .”	“A female parent (of animals, now usually of quadrupeds). Correlative to <i>sire</i> .”

Table 46: Definitions of “sire” and “dam”

It seems that [SIRE] and [DAM] both include a wide number of quadrupeds, with the horse as a prototypical member. Such categories have no equivalent in French.

b. Google search

Out of the first thirty results of the searches “sire” and “dam” on Google (May 2013), no result referred to animals.

On the other hand, the searches “female”+”dam” and “male”+”sire” (Google, May 2013) proved to be more successful. The following two tables present the relevant results obtained after analyzing the first thirty ones and discarding the websites whose origin is unsure, which do not refer to animals or in which the key words appear out of context.

N°	Website address and description:	Animal species referred to:
1	www.acmc.co.uk/meidam_female.asp	Pig
2	www.acmc.co.uk/volante_female.asp	Pig
4	www.fowberry-alpacas.com/our_herd/.../jameelia	Llama (alpaca)
5	www.cotswoldalpacas.co.uk/female-alpacas-for-sale.php	Llama (alpaca)
7	www.zucci-chinese-crested.com/female.php	Dog (zucci)
9	www.boztdown-alpacas.co.uk/.../Spring%20Alpaca%20Fiesta%202012.pdf	Llama (alpaca)
10	www.auldmillalpacas.co.uk/females.html	Llama (alpaca)
11	www.apolloalpacas.co.uk/femalesforsale.html	Llama (alpaca)
12	www.falabellapersians.co.uk/prevkitt.htm	Cat (Persian)
13	www.biboukatz.co.uk/cats.php	Cat (exotic breed)
15	www.lymealpacas.co.uk/alpaca-sales/35-female-alpaca	Llama (alpaca)
16	www.blenheimalpacas.co.uk/breeding%20females.pdf	Llama (alpaca)
17	www.avomliepersians.pwp.blueyonder.co.uk/page4.htm	Cat (Persian)
19	www.albioneurasiers.co.uk/AlbioneurasiersOurEurasiers	Dog (Albion Eurasier)
20	www.scottish-blackface.co.uk/blackface-sheep-news.cfm?NewsID...	Sheep (Blackface)
23	www.scotland.gov.uk/Resource/Doc/971/0000216.pdf Website of the Scottish government.	Bovine animals
24	www.heathrosecats.webeden.co.uk/exotics/4558897077	Cat (Persian)
25	www.snowhillalpacas.com/newsandeventspg2.html	Llama (alpaca)
26	www.chase-end-alpacas.co.uk/females.htm	Llama (alpaca)
29	www.greyhoundpredictor.com/prediction/page6.html	Dog (greyhound)
30	www.allgoats.com/Downloads/registration_notes03-12.pdf	Goat

	British Goat Society.	
--	-----------------------	--

Table 47: Search "female"+"dam"

N°	Website address and description:	Animal species referred to:
4	www.fowberry-alpacas.com/stud_males/.../WD_miguel_of_fowberry	Llama (alpaca)
8	www.apolloalpacas.co.uk/malesforsale.html	Llama (alpaca)

Table 48: Search "male"+"sire"

Almost all of these results point to websites in which breeders describe their animals: for example, first table, result n°25, “Snowhill Alexandra. Date of birth: 14-6-2008. (s. White) Sire: Siverstream Czar of Anzac. (s.White) Dam: Silverstream Escudo of Anzac. (s.White)”. Sometimes, “sire” and “dam” are used with definite articles (first table, result n°30: “if the dam is registered”) or possessive articles (first table, result n°10: “her dam is...”), which confirms that, contrary to “cock” and “hen”, “bull” and “cow” etc., “sire” and “dam” do not merely denote male and female animals, but more specifically the father and mother of an animal. In almost all cases, “sire” appears at least once in the same result as “dam”, which shows that they are correlative and that they are probably used to refer to the same animal species.

The animal species which are members of the categories [DAM] and [SIRE] are extremely various: pets (cats, dogs...), farm animals (pigs, sheep...), either common (goat) or more exotic (llama). They have very few common points, except that they are all quadrupeds, as indicated in the definition, and they are all domestic animals. Indeed, it seems that “sire” and “dam” serve above all to retrace the pedigree or lineage of an animal, which explains why they are not (or less) used for wild animals.

It is difficult to determine, from these results, which species are more central than others to the categories [SIRE] and [DAM], and whether all domestic quadrupeds having an offspring are equally likely to be called “sire” or “dam”. Strangely enough, the horse, which was mentioned as an example in the dictionary definitions, does not appear in the tables: however, this does not necessarily mean that the horse is not a member (even one of the most central members) of these categories.

IV. Nouns denoting young animals (as opposed to adults)

1. “Chick”

a. Definition

<i>OED</i> 2013, entry “chick”	<i>Grand Robert</i> 2013, entry “poussin”
“A chicken; <i>esp.</i> a young chicken; sometimes, the young of any bird. <i>esp.</i> The young bird still in the egg or only just hatched.”	“1 Jeune poulet, nouvellement sorti de l’œuf, encore couvert de duvet. La poule et ses poussins. 2 Zool. Jeune oiseau (par rapport aux adultes, aux parents). Un poussin d’aigle, de pingouin.”

Table 49: Definitions of “chick” and “poussin”

Contrary to its related categories, [COCK] and [HEN], [CHICK] does not include other species than birds. But the three categories hinge around the same central member: the domestic fowl.

What is interesting too is that the French category [POUSSIN] is very similar to the category [CHICK] (it contains quite the same members: first the young chicken, then other young birds) whereas the differences between [COQ] and [POULE] on the one hand, and [COCK] and [HEN] on the other hand, are much more important.

b. Google search

Among the first thirty results obtained from the search “chick”, only three relevant results refer to animals, and more specifically to young chickens, which confirms that they are the most prototypical members of the category [CHICK]. No other species is referred to.

While the search “gorcock” gives 25,300 results and “gorhen” 14,300 (which are quite significant results), “gorchick” gives only 10 results, which shows that it is virtually not used. Likewise, “cock pheasant” gives 24,300 results and “hen pheasant” 12,900, whereas “chick pheasant” gives 1,020 results (Google, May 2013). In fact, “cock” and “hen” are integrated into several names of bird species in a quite similar way, but it seems that “chick” is used slightly differently.

2. “Calf”

a. Definition

<i>OED</i> 2013, entry “calf”	<i>Grand Robert</i> 2013, entry “veau”
“The young of any bovine animal, <i>esp.</i> of the domestic cow. ‘Calf is applied to all young cattle until they attain one year old”	“Petit de la vache, pendant sa première année, qu’il soit mâle ou femelle”
“The young of other animals; as of deer, the elephant, the whale.”	
Compounds “sea-calf”: “a popular name of the seal, <i>esp. Calocephalus vitulinus</i> (or <i>Phoca vitulina</i>)” “calf-whale”	“Veau de mer (vx), veau marin [...] → Phoque.”

Table 50: Definitions of “calf” and “veau”

The category [CALF] has quite the same organization as [BULL] and [COW], which resembles the structure of radial categories, with the domestic bovine species as the central subcategory, then other bovine species which are extended from it, and finally other large animals like the elephant and the whale (and the deer, which was not mentioned for [BULL] and [COW]).

As for the French category [VEAU], it is also very similar to the categories [TAUREAU] and [VACHE], with the domestic species as its central (and probably only) member, except for the expression “veau marin” which denotes the seal, exactly as in English (“sea-calf”).

b. Google search

This table presents the relevant results obtained from the search “calf” (Google, February 2013), after discarding double results, websites from uncertain origins, results out of context etc.

N°	Website address and description:	Animal species referred to:
6	www.organicvet.co.uk/Cattleweb/disease/Scour/scour1.htm Veterinary website. “calf diarrhoea”	Domestic bovine species

8	www.guardian.co.uk/world/2012/mar/.../six-legged-cow-switzerland Newspaper article. “Six-legged calf”	Domestic bovine species
9	www.newscientist.com/.../dn22324-calf-produces-worlds-first-hypoallergenic-milk.html Scientific website. “a calf has been genetically modified”	Domestic bovine species
10	www.mcl.unisonplus.net/cowandcalf.htm Website of the Movement for Compassionate Living. “the cow and her calf”	Domestic bovine species
14	www.blade-farming.com/our-calf-rearers.htm “calf rearers”	Domestic bovine species
16	www.molevalleyfarmers.com/.../Choosing_the_best_feed_for_young_calves “young calves”	Domestic bovine species
17	www.dailymail.co.uk/.../Farm-sells-milk-Cadbury-shoots-male-calves-feed-hunt-hounds.html Newspaper article. “male calves”	Domestic bovine species
21	www.thesun.co.uk/sol/.../Dolphin-carries-dead-calf-for-three-days.html Newspaper article. “Fisherman spotted a female dolphin battling rough seas as she tries to keep her dead calf afloat in the Sanniang Bay, south China”	Dolphin
22	www.dairyco.org.uk/technical-information/.../calf-pneumonia/ “Calf Pneumonia”	Domestic bovine species
24	www.ciwf.org.uk/what_we_do/calves/default.aspx Compassion in World Farming website. “calves”	Domestic bovine species
25	www.johnthompsonandsons.co.uk/products/calf Products for farmers. “your calf’s health”	Domestic bovine species
27	calf-feeding.co.uk/ Calf feeding machines for farmers.	Domestic bovine species
28	www.molevalleyfarmers.com/mvf/info/farming/calf “your calves”	Domestic bovine species
29	www.bocmpauls.co.uk/compounds/ruminant-calf-rearer Animal feeds producer. “calves”	Domestic bovine species
30	www.bocmpauls.co.uk/compounds/ruminant-calf-rearer Calf hutches for farmers. “calves”	Domestic bovine species

Table 51: Search "calf"

Considering the high number of results referring to the domestic bovine species (*Bos taurus*), this is indeed the most central member in the category [CALF], as in [BULL] and [COW]. However, in result n°21, “calf” also refers to a dolphin, a sea mammal which has few common points with bovine species, but is quite close to the whale (mentioned as an example in the dictionary definition).

3. “Pup” / “puppy” / “whelp”

a. Definition

OED 2013, entry “pup”	OED 2013, entry “puppy”	OED 2013, entry “whelp”	Grand Robert 2013, entry “chiot”
“A puppy, a young dog; a whelp.”	“A young dog, <i>esp.</i> one that is less than a year old.”	“The young of the dog. Now little used, superseded by <i>puppy</i> .”	“Jeune chien.”
“a. A young seal or sea lion. b. The young of various other animals, as rats, mice, bats, viviparous sharks, etc.”	“In extended use: a young seal (or other young carnivore). Also: a young or small shark (cf. <i>puppy shark</i>) <i>rare.</i> ” Puppy shark: “any of various small or young sharks; <i>esp.</i> a sharpnose shark (genus <i>Rhizoprionodon</i>)”.	“The young of various wild animals, <i>esp.</i> and now only (chiefly as a literary archaism) of such as the lion, tiger, bear, and wolf, to the young of which the name <i>cub</i> is now usually applied.”	

Table 52: Definitions of “pup”, “puppy”, “whelp” and “chiot”

The categories [PUP], [PUPPY] and [WHELP] apparently have the same prototypical member: the young dog. The major difference between them (except for the fact that “whelp” is currently less used than “pup” and “puppy”) lies in their more peripheral members.

[PUP] and [PUPPY] have quite similar peripheral members. For instance, both include young seals, but also, more surprisingly, young sharks (which are carnivores as well, therefore they are members of the category, although they are fishes and physically very different from

the rest of the members). However, a few differences can be noticed. First, rats, mice and bats are mentioned as members of [PUP], but not of [PUPPY]. It is worth noting that these species are not carnivores (for instance, mice and bats generally eat seeds, fruit or insects), which suggests that eating flesh is clearly not a necessary or sufficient condition to enter the category, and that it is probably more complex. Besides, while the definition of “pup” only mentions young sharks, “puppy” can apparently also be used for some species of sharks in general (without regard to sex).

On the other hand, the peripheral members of [WHELP] are very different from those of [PUP] and [PUPPY]: young lions, tigers, bears, wolves, and other wild, carnivorous animals which are more frequently referred to as “cubs”. In fact, while “whelp” is a synonym of “puppy” in the case of the dog (the prototypical member), it becomes a synonym of “cub” as far as other members are concerned.

As for the French category [CHIOT], it visibly contains only one member: the young dog. Indeed, the young rat and mouse are referred to with specific names (“raton”, “souriceau”); by contrast, the young shark and bat have no particular name. As for the young seal, it is called “blanchon”. What is striking is that, although the definition of the *Grand Robert de la langue française* (2013) simply defines “blanchon” as “petit du phoque”, the French article “blanchon” on Wikipedia (2013) defines it in the following way: “Le blanchon est le petit du phoque (*loup-marin*), également appelé chiot ou veau”. In the English version of the same article (Wikipedia, article “Whitecoat”, 2013), young seals are referred to as “pups” and their mothers as “cows”. Although this piece of information should be considered with caution, it might indicate that English and French categories share more common points than expected. By the way, while one has to admit that the French noun “chiot” cannot refer to species of sharks in the way “puppy shark” can, “chien de mer”, on the other hand, does refer to several species of sharks (see “dog” and “bitch”)...

b. Google search

These are the results in which “pup” (Google, February 2013) refer to animals, after discarding double results, websites whose origin is uncertain and other irrelevant websites.

N°	Website address and description:	Animal species referred to:

1	www.dailymail.co.uk/.../Britains-dinkiest-dogs-owner-reveals-pups-battle-survive.html Newspaper article. “the smallest puppy ever born in Britain”	Dog (Yorkshire terrier)
2	www.dailymail.co.uk/.../Cute-seal-pup-appears-wave-sea-hundreds-animals-gather-tiny-British-island-birth.html Newspaper article. “Cute seal pup”	Seal
4	www.pup-id.com/ “Do you find it difficult to differentiate your litter of identical pups? Then try PUP-ID.”	Dog
5	www.ciao.co.uk/Hasbro_FurReal_Friends_GoGo_My_Walking_Pup__8683485 Toy: “GoGo My Walking Pup”	Dog
6	uk.answers.yahoo.com/question/index?qid... Forum. “my 4 month old collie pup” “my German Shepherd puppy”	Dog (collie)
7	www.thesun.co.uk/sol/.../Pocket-pup-could-be-the-smallest-in-Britain.html Newspaper article “Pocket pup could be the smallest in Britain”	Dog (Yorkshire terrier)
8	gouk.about.com/od/ukfamilytravel/ig/Animal.../Wolf-Cub.htm “Canadian Timber wolf with her pup”	Wolf
13	www.britishpathe.com/video/alsatian-has-14-pup/query/alsatians “An Alsatian dog with her 14 puppies”	Dog (Alsatian)
15	www.mirror.co.uk/.../pups-trafficked-young-dogs-are-being-1391112 Newspaper article “Pups trafficked: young dogs are being taken from their mothers”	Dog
17	www.mikipet.com/?mikki_training=mikki-pup-pee-pads “your puppy”	Dog
18	uk.answers.yahoo.com/question/index?qid Forum. “puppies”	Dog
20	www.telegraph.co.uk/.../Pup-idol-Windsor-Championship-Dog-Show.html Newspaper article. “Pup Idol: Windsor championship dog show”	Dog
25	www.belfasttelegraph.co.uk/.../playful-pup-to-lead-out-battalion-16254791.html Newspaper article. “playful pup/puppy”	Dog (Irish wolfhound)
27	fr.answers.yahoo.com/question/index?qid... Forum. “puppy”	Dog (collie)
30	www.avanquest.com/UK/software/hollywood-pets-pup-idol-51665 “Pup Idol, become a star with your pretty dog”	Dog

Table 53: Search "pup"

Apart from the high number of results pointing to various breeds of dogs, result n°2 mentions a “seal pup”, which confirms that the seal is a member of the category. In fact, [PUP] is related to [DOG] and [BITCH]: the three categories visibly have the same central member (the dog); besides, they share many other members (the seal, for instance, is also a member of the category [DOG], as mentioned in the dictionary definition).

None of the first thirty results of “pup shark” (Google, May 2013) is relevant, which suggests that this expression is not used, contrary to “puppy shark”, mentioned in the dictionary definition. In fact, although “pup” is the shortened form of “puppy”, the two are not exact synonyms: while “puppy” can be used for species of sharks in general, “pup” cannot. By contrast, none of the first thirty results of “shark puppy” refers to a young shark, while “shark pup” (Google, May 2013) gives many relevant results (“tiger shark pup”, “whale shark pup” etc.).

As for the search “whelp” on Google (May 2013), it gives no relevant result (in the first thirty results, “whelp” is most often used as a verb, or out of context).

4. “Kit” / “kitten”

a. Definition

<i>OED</i> 2013, entry “kit”	<i>OED</i> 2013, entry “kitten”	<i>Grand Robert</i> 2013, entry “chat”
“A shortened form of kitten.”	“a. The young of the cat; a young cat (not full-grown).”	[Example] “Une chatte et ses chatons.”
	“b. <i>transf.</i> Applied to the young of some other animals.” [Quotations] [...] “1957 J. H. F. Stevenson <i>Mink in Brit.</i> (ed. 2) v. 18 Once the kittens, or kitts as they are called, are able to fend for themselves, they do so. 1964 R. M. Lockley <i>Private Life Rabbit</i> iv. 54 It was possible to handle and weigh week-old kittens without causing their desertion by the doe.” [...]	

Table 54: Definitions of “kit”, “kitten” and “chaton”

The young cat is visibly the centre of the category [KIT]/[KITTEN], from which are extended some noncentral animal species (which are quite similar in size, overall shape, colour etc.), like the mink or the rabbit.

As for “chaton”, it does not even have its own entry in the *Grand Robert de la langue française*, which suggests that it is dependent on the category [CHAT] and has no other members than the cat.

b. Google search

Out of the first thirty results of the search “kitten” on Google (May 2013), twenty-three relevant results used “kitten” to refer to animals, and in all cases, these animals were young cats, which undoubtedly confirms that they are central to the category.

Among the first thirty results of the search “rabbit”+“the kitten” (Google, May 2013), one was relevant (www.photography-tips-forum.com/rabbit-kitten-1st-post_topic4608.html): it consists in a description of the picture of a young rabbit, referred to as “rabbit kitten” and as “the kitten”. This seems to confirm that rabbits can be (very peripheral) members of the category [KITTEN]. On the other hand, “mink”+“the kitten” (Google, May 2013) gives no relevant results among the first thirty ones.

5. “Foal” / “colt”

a. Definition

<i>OED</i> 2013, entry “foal”	<i>OED</i> 2013, entry “colt”	<i>Grand Robert</i> 2013, entry “poulain”
“The young of the equine genus of quadrupeds; <i>properly</i> , one of the male sex, a colt; but also used where the sex is not specified, a colt or filly.”	“The young of the horse, or of animals of the horse kind.”	“Petit du cheval, jeune cheval mâle ou femelle (jusqu’à l’âge de vingt-quatre ou trente mois).”
“Applied to the young of the elephant or camel.”	“In Scripture applied also to the young of the camel.”	

Table 55: Definitions of “foal”, “colt” and “poulain”

The prototypical member of [FOAL] and [COLT] is quite the same: the young horse. Yet there seems to be a slight difference between these two categories, which is that [FOAL]

includes from the beginning on all equine quadrupeds, among which the horse is more central, whereas [COLT] basically refers to the horse, which is then extended to other similar species “of the horse kind”. In fact, while [FOAL] appears to be closer to a standard prototype category, [COLT] has a structure resembling that of a radial category. Another difference can be found in the peripheral members of each category: while young camels and elephants are members of the category [FOAL], camels just used to be members of the category [COLT].

In the previous Google search, “zebra”+”the mare”, “foal” was found together with “mare” and “stallion” to refer to horses as well as zebras (other equine animals), which tends to show that the three categories are related together. Yet, [MARE] and [STALLION] appear to be slightly more restricted than [FOAL], since they contain only equine animals (apart from a few exceptions in [STALLION], which includes dogs or sheep in reference to their use in breeding, but still not camels or elephants, which are just members of the category [FOAL]).

As for [POULAIN], in French, it apparently contains only one member, the young horse. Many other equine species, as well as the camel and elephant, are referred to with specific nouns: “zébreaux”, “chamelon”, “éléphanteau” etc.

b. Google search

Out of the first thirty results obtained from the search “foal” on Google (March 2013), twenty-two relevant results used “foal” in reference to animals: these animals were always young horses. The first thirty results of “colt” (Google, May 2013) do not refer to animals.

“Foal” was used for a young camel in four results among the first thirty ones obtained from the search “camel”+”the foal” (Google, May 2013). By contrast, “camel”+”the colt” (Google, May 2013) gave three relevant results, which were all summaries of the same movie; in one of these results, “colt” was used alternately with “camel calf”. This relatively mirrors the dictionary definitions. Nevertheless, it appears that elephants may not be members of the category [FOAL], since none of the first thirty results obtained from the search “elephant”+”the foal” used “foal” for a young elephant (Google, May 2013).

6. **“Cub”**

a. Definition

<i>OED</i> 2013, entry “cub”	<i>Grand Robert</i> 2013, entry “renardeau”
------------------------------	---

“orig. A young fox.”	“Petit du renard”
“By extension: The young of the bear and of other wild beasts; also of the whale. For the young of the bear, lion, etc. the earlier word was <i>whelp</i> ”	
“Cub-bear” “Cub-fox”	

Table 56: Definitions of “cub” and “renardeau”

It seems that the central subcategory in [CUB] is the young fox, from which are extended a wide variety of other wild animals: the bear, the lion, and even the whale, which are all very different from the fox (they are much bigger, live in different environments etc.), which makes it hard to identify the nature of the motivation link connecting all these species to the centre.

In French, the young fox has a specific name, “renardeau”, as well as the young bear (“ourson”), lion (“lionceau”) and whale (“baleineau”): as often, these nouns are built from the noun referring to the species in general (“renard”, “ours”, “lion”, “baleine”).

What is especially interesting in the English category [CUB] is that, contrary to [CHICK] ([COCK] and [HEN]) or [CALF] ([COW] and [BULL]) for instance, it cannot be grouped together with two other categories which would include most of the male and female parents of its members, in order to form a “family”. For instance, while the male and female of the fox are included in the category [DOG] and [BITCH], the male and female of the bear are members of [BOAR] and [SOW]; as for the male and female of the whale, they are in the category [BULL] and [COW].

b. Google search

Here are the relevant results in which “cub” (Google, February 2013) refers to animals, in the first thirty results:

N°	Website address and description:	Animal species referred to:
1	www.telegraph.co.uk/.../Tokyos-first-giant-panda-cub-in-24-years-born-to-diplomatic-dispute.html Newspaper article. “Tokyo’s first giant panda cub”	panda
3	www.mirror.co.uk/.../panda-cub-fooled-by-zoo-workers-1370026	panda

	Newspaper article. “panda cub”	
9	www.bbc.co.uk/news/world-us-canada-19916115 BBC News. “panda cub”	panda
10	www.guardian.co.uk/world/2012/.../giant-panda-cub-national-zoo Newspaper article. “a female giant panda cub”	panda
22	natgeotv.com/uk/leopard-queen/videos/lost-cub National Geographic Channel. “her cub”	leopard

Table 57: Search “cub”

Although the recurrence of the panda in this table may rather be the consequence of current events largely reported by the press (the birth of a panda in a zoo) than the sign of the centrality of the panda in the category [CUB], it still indicates that the members of this category are more diverse than expected. The panda is most probably a member extended from the bear (which is itself a member, and perhaps one of the most central ones, in the category [CUB]). As for the leopard, it is probably extended from other species like lions or tigers, which appear to be rather central members too.

7. “Joey”

a. Definition

<i>OED</i> 2013, entry “joey”
“A young kangaroo; also <i>gen.</i> a young animal”
[Quotations]
[...]
“1887 <i>All Year Round</i> 30 July (Farmer), Joey..is applied indifferently to a puppy, or a kitten, or a child”

Table 58: Definition of “joey”

While in English, “joey” prototypically refers to a young kangaroo but perhaps also to other young animals, the French does not even have a noun to designate the young kangaroo (which will be called “bébé kangourou” or “petit du kangourou”).

b. Google search

Among the first thirty results of the search “joey” on Google (May 2013), none referred to an animal. The search “animal”+“the joey” (Google, May 2013) proved more successful:

N°	Website address and description:	Animal species referred to:
1	www.telegraph.co.uk/.../Tie-me-kangaroo-man-down-girls-why-women-are-lusting-over-animal-lover-Chris-Barnes.html Newspaper article.	kangaroo
4	www.animalcorner.co.uk/wildlife/wallaby.html Information about animals.	wallaby
6	www.ypte.org.uk/animal/kangaroo-grey-/136 Charity (Young People's Trust for the Environment).	kangaroo
7	www.express.co.uk/news/.../Camilla-charmed-by-orphan-kangaroo Newspaper article.	kangaroo
8	www.andrewspencephotography.com/photo_2931285.html Website of a photographer.	kangaroo
10	www.uplifd.com/baby-wombat-and-joeey-kangaroo/ "the joeey kangaroo and the baby wombat"	kangaroo
12	www.ehow.co.uk/how_6586693_nurse-premature-sugar-glider-joeey.html "How to nurse a Premature Sugar Glider Joey"	Sugar glider ("a marsupial member of the opossum family")
13	uk.finance.yahoo.com/...animal.../anzac-the-joeey-and-peggy-the-wombat-have-become-best-friends-after-sharing-a-pouch-tog Animal pictures.	kangaroo
14	www.dudleyzoo.org.uk/news/spot-joeey Website of a zoo.	kangaroo
16	www.dailymail.co.uk/.../Bernie-Kangaroo-joeey-brought-life-rescuer.html Newspaper article about "Bernie the kangaroo joeey"	kangaroo
17	www.dailymail.co.uk/.../How-catch-live-kangaroo-shopping-bag-required.html Newspaper article.	kangaroo
18	jonathanpow.com/?attachment_id=1051 Picture. "Wallaby joeey in surrogate rucksack pouch"	wallaby
19	www.newsandstar.co.uk/news/joeey-takes-first-look-at-the-world-1.709326?... Newspaper article.	wallaby
20	news.bbc.co.uk/2/hi/science/nature/8520268.stm BBC News.	Marsupials (wallabies and kangaroos)
22	www.rzss.org.uk/media-centre/press.../press-release?...for... "after giving birth a female koala will carry the joeey in her pouch"	koala

24	www.cambridge-news.co.uk/.../Especially-for-marsupial-Kylie-and-Jasons-rare-joey-13022013.htm Video.	wallaby
26	www.belfastzoo.co.uk/ZooHome/NewsAndEvents/4926.aspx Website of a zoo.	kangaroo
27	www.cannonhallfarm.co.uk/other-animal-facts/ Website of a farm.	wallaby
29	discuss.glasgowguide.co.uk/lofiversion/index.php/t18550-50.html Forum.	kangaroo
30	www.princeofwales.gov.uk/.../the-prince-and-duchess-arrive-longreach Article.	kangaroo

Table 59: Search "animal" + "the joey"

These results confirm that the young kangaroo is most probably the central member of the category [JOEY], but not the only member. The wallaby, the koala, but also the sugar glider are also referred to as “joeys”. One might argue that the wallaby is physically very similar to the kangaroo, but the koala and especially the sugar glider (which is much smaller and shares few visible common points with the kangaroo) may appear as more surprising. Of course all these species are marsupials, which makes them part of the same biological sub-family as kangaroos. However, it does not follow that the category [JOEY] necessarily includes all young animals scientifically defined as marsupials. In result n°10, while “joey” is clearly used for the young kangaroo, it is not used, in the very same context, for the young wombat (simply referred to as “baby wombat”), which is nevertheless a marsupial as well. Besides, the wombat is apparently not less different from the kangaroo than the koala or the sugar glider. This suggests that the organization of the category [JOEY] and the links connecting its different members are more complex than it seems.

8. “Hatchling”

a. Definition

<i>OED 2013, entry “hatchling”</i>
“A very young fish or bird, etc., usually artificially hatched and not old enough to take care of itself.”

Table 60: Definition of "hatchling"

“Hatchling” slightly differs from other nouns like “chick” or “cub” in that it adopts another point of view on animals. Indeed, being built from the verb “hatch”, it does not

consider the young animal directly for itself, but as the product of an egg that has just hatched. This explains why it can refer to various species which lay eggs, although they are quite different (fishes, birds...). There is no such noun in French, which by contrast has a specific noun for young birds (“oisillon”) but no noun at all for young fishes.

b. Google search

Among the first thirty results of the search “hatchling” on Google (March 2013), thirteen were irrelevant or with uncertain origin. These are the remaining results:

N°	Website address and description:	Animal species referred to:
1	www.pras-uk.co.uk/guidefirstsnake.htm “A guide for looking after your first hatchling snake”	Snake
3	www.annestokes.com/fantasy/hatchling.htm Fantasy art gallery. “hatchling”, “baby dragon”	Dragon
6	www.tortsmad.com/hatchlings.htm Website on tortoises. “hatchling tortoise”	Tortoise
7	www.tortoisetrust.org/articles/hatchouse.htm Website on tortoises. “the hatchling”	Tortoise
9	www.snakepictures.co.uk/snake_feeding_problems.htm Website on Corn Snakes. “feeding hatchling corn snakes”	Snake
11	www.independent.co.uk/.../rare-reptile-hatchling-found-in-new-zealand-1648848.html Article from the <i>Independent</i> . “Rare reptile hatchling found in New Zealand”	Reptile
12	www.independent.co.uk/.../africa-the-best-pictures-from-david-attenboroughs-series-8483740.html?... Article from the <i>Independent</i> . “A cameraman follows a green turtle hatchling”	Turtle
14	www.monkfieldnutrition.co.uk/news/.../12-tub-hatchling-snake-rack Website on reptile nutrition. “hatchling snake”	Snake
15	www.wildworldreptileshop.co.uk/small-hatchling-tub/ Reptile shop. “tubs for hatchling”, “we keep our hatchling colubrids in these”	Reptile / colubrid (snake)
16	www.wildworldreptileshop.co.uk/cadbury-hatchling-tub-large/	Reptile

	Reptile shop. “hatchling tub”, “these tubs are useful for keeping small hatchlings or insects in”	
17	www.batk.org.uk/index.php?option=com_content...id... Website on tortoises. “hatchling and juvenile care of Mediterranean tortoises”, “if you have bought or been given a hatchling”	Tortoise
20	www.zoochat.com/.../hatchling-dwarf-croc-exhibit-crocodiles-world-258069/ Forum.	Crocodile
21	komodoproducts.com/products/basic-hatchling-kit?id=18 Reptile shop. “basic hatchling kit”, “all the essentials to set-up and keep hatchling snakes, including corn snakes, milk snakes and many more”	Snake
23	www.livefoods.co.uk/.../live-locusts-hatchling-prepack-tub-reptile-livefood-p-283 Reptile shop. “hatchling tubs”	Reptile
24	www.reptileforums.co.uk/.../604791-hermann-hatchling.html Reptile forum. “my first tortoise a 3 month old hermann hatchling”	Tortoise
26	www.xlibrispublishing.co.uk/bookstore/bookdisplay.aspx?bookid... Book: “Adventures of the Littlest Hatchling”	Turtle
30	www.thetortoiseshed.com/index.php/care.../hatchling-housing Website on tortoises. “Hatchling housing”, “hatchlings are more delicate”	Tortoise

Table 61: Search “hatchling”

Not only can “hatchling” refer to birds and fishes (as indicated in the definition), but also to a wide variety of reptiles (snakes, crocodiles, tortoises and turtles) and even dragons, that is to say imaginary animals. Therefore, [HATCHLING] is quite close to be a classical category, since it apparently has very clear conditions of membership: it includes all young animals which are born from an egg, and only them. Nevertheless, one may wonder whether species like some insects and arachnids, which are scientifically speaking oviparous animals as well as birds or reptiles, can have the same place in the category. By the way, in result n°16, “hatchlings” and “insects” are separated by the conjunction “or”, which seems to indicate that although a great majority of insects are born from eggs, speakers are less inclined to include them in the category [HATCHLING]. In fact, it would not be surprising if even a category like [HATCHLING] showed degrees of membership and prototype effects.

Conclusion

The following table recapitulates the nouns of the corpus which have been studied in the second chapter, with the animal species that each one of them refers to. It does not take into account the species which are exclusively denoted by compounds (like “tom-tailor” or “jack-spaniard”), but only the cases in which the noun considered can be used alone (ex: “cow”) or together with the name of the species, either before or after it (ex: “tom turkey”, “fox cub”). When the various sources consulted (dictionaries, Google searches...) do not coincide as far as a particular species is concerned (for instance, when it is mentioned in the definition of the *Oxford English Dictionary* but gives no relevant results on Google), it is written in italics.

Category	Central member(s) = prototype(s) + → + Centrality	Peripheral members -	Borderline members	Members clearly excluded from the category	Remarks
Standard prototype categories with one obvious central member					
[SIRE] and [DAM]	Horse	Other domestic quadrupeds: Llama Dog Cat Pig Bovine Sheep Goat			
[FOAL]	Horse	Other equine animals (ex: zebra)	Camel		

			<i>Elephant</i>			
Standard prototype categories with one probable central member						
[DEER]	Red deer	Other deer: Fallow deer Roe deer Sika deer Muntjac Chinese water deer				
Standard prototype category with two obvious central members						
[PET]	Cats Dogs	Other animals kept for companionship: Rabbit Tortoise			Wild animals living in captivity: Lion Tiger	
Standard prototype categories in which no particular species appear as clear central members						
[ANIMAL]	Mammals close to humans (pets, ex: cats, dogs; farm animals; laboratory animals...)	Wild mammals	Birds Reptiles Fishes Insects	Human beings Protozoans Sponges	Plants Minerals	
[CREATURE]	Unordinary animals (strange, frightening, non-existing...)	Other animals			Human beings	

[BEAST]	Ferocious, potentially frightening animals <i>(quadrupeds)</i>	Chased quadrupeds; quadrupeds used for breeding or riding: Ox Horse Ass			Birds Reptiles	Human beings Fishes Insects	
Radial categories with one obvious central member, plus extensions							
[BUG]	Bed-bug	Insects in the same family, or similar insects: Shield-bug Earwig Centipede	Less similar insects: Ladybug Bumblebee	Other small animals: Worm Slug Spider Scorpion	Microbes (whether they are protozoans or not)		
[COCK] and [HEN]	Chicken (domestic fowl)	Similar birds: Pheasant Partridge Grouse	Less similar birds: Pigeon Sparrow, finch, redstart, blackcap... Budgerigar, parrot, parakeet...		[HEN] only: Fishes Crustaceans (ex: lobster, crab)		Species denoted without regard to sex: ([HEN] only) clam
[CHICK]	Chicken (domestic fowl)	Other birds					
[BULL] and [COW]	<i>Bos Taurus</i> (domestic bovine species)	Other bovine animals: Buffalo Bison	Elephant Rhinoceros Alligator Whale Seal				
[CALF]	<i>Bos Taurus</i> (domestic	Other bovine animals	Deer Camel				

	bovine species)		Elephant Whale Dolphin Seal			
[DOG] and [BITCH]	Dog	In the same family: Fox Wolf	Other carnivorous animals: Bear Ferret Otter Seal			
[PUP] / [PUPPY]	Dog	In the same family: Wolf	Seal ([PUP] only): rat, mouse, bat	Shark		
[WHELP]	Dog	In the same family: Wolf	Other wild animals: Lion, tiger Bear			
[BUCK] and [DOE]	Fallow-deer	Other deer (but not all): Roe deer Chinese water deer Sambar deer Reindeer	Other animals resembling deer or goats: Chamois Goat Antelope ([BUCK] only)	Other animals: Hare, rabbit Kangaroo Ferret, rat		

[STAG] and [HIND]	Red deer	Other deer (but not all): Sika deer	Other quadrupeds ([STAG] only): Horse Bull Boar Ram	Some birds: Chicken Turkey			Species denoted without regard to sex: ([STAG] only) wren ([HIND] only) some species of fish
[STALLION] and [MARE]	Horse	Other equine animals: Zebra ([STALLION] only) Ass	Other animals, in reference to their use for breeding ([STALLION] only): Dog Ram				
[COLT]	Horse	Other equine animals	<i>Camel</i>				
[KIT] / [KITTEN]	Cat	Some other animals: Rabbit <i>Mink</i>					
[JOEY]	Kangaroo	Other marsupials (but not all, ex: not the wombat): Wallaby Koala Sugar glider <i>Other young animals: puppy, kitten</i>					
Radial categories with one probable central member, plus extensions							
[BOAR] and [SOW]	Domesticated pig	Wild species of pigs	Guinea-pig Bear <i>[BOAR] only: Beaver, raccoon</i>				

[CUB]	Fox	In the same family: Wolf	Other wild animals: Lion, tiger, leopard Bear, panda	Whale			
Prototype categories whose general organization is unclear							
[TOM]	Cat	Some birds: Turkey Tit					
[JACK]	Either the ass or the hawk	Rabbit Hare					Species denoted without regard to sex: Jack-rabbit Some birds: jackdaw, Cornish jack etc. Some fishes: pike.
[JENNY]	Either the ass or the wren	Some birds: <i>Owl</i>					
[GILL] / [JILL]	Ferret?	Polecat, weasel Rabbit, hare <i>Kangaroo, wallaby, opossum, wombat</i>					
[HATCHLING]	Reptile?: Snake Turtle Tortoise Crocodile	Birds Fishes		Insect?			

What directly emerges from this table and from the various analyses which have been detailed in the second chapter is that categories which include more than one animal species in English have extremely different organizations.

The classical theory, which is entirely based on the fact that all categories are defined by a limited set of necessary and sufficient conditions, very soon appeared too systematic and restrictive to give a precise account of this diversity. In many categories, the features shared by all members are none, or so few that they are not sufficient to clearly distinguish the category. As for the few categories whose members visibly all share a significant characteristic, and which may appear on the face of it to have definite boundaries separating members from non-members (ex: [HATCHLING]), they still tend to show variations of membership (fuzzy boundaries) and centrality (prototype effects) which are incompatible with classical principles (definite boundaries, equal status of all members etc.). Besides, a great many of features involved in the definitions of the categories are relative (for example, /small/ in [BUG]), and most often this relativity is not even constant enough to predict the centrality of the members (for instance, it is not true that, the smaller an animal is, the more central to the category [BUG] it will be).

While no classical category strictly speaking can be found in the corpus, there are some **standard prototype categories**. Most often – but not always – these categories are general nouns, like “animal” or “creature”. Their various members are linked together by multiple “family resemblances”, and some of them appear to be “better examples” than others.

- Some of these categories (ex: [FOAL]) have a clear structure, with very distinct degrees of centrality: one well-defined prototype, then less central members, then even less central members etc.
- In one particular case ([PET]), there is not one, but two prototypes which stand out as equally central.
- In some other categories (ex: [DEER]), the degrees of centrality are less obvious, but still perceptible.
- Finally, in very heterogeneous categories which contain a high number of members, either real or imaginary ([ANIMAL], [CREATURE], [BEAST]), it is more difficult to isolate specific species and determine their centrality, but graded membership and centrality can nevertheless be noticed in the general structure.

These categories can be considered as fairly logical: in [FOAL], for example, the horse is central, followed by other equine animals which share many similarities with it, and then by the camel which is visibly more different, but at the same time still similar to the horse, in a way. Nevertheless, the structural logic of a category cannot be summarized in a handful of simple principles: most often, the similarities or “family resemblances” which group the various members together consist in a wide variety of physical features (for instance, possessing antlers in [DEER], being a quadruped in [SIRE] etc.); they can also take into account less directly visible characteristics, like the function of an animal in a given society (ex: [PET]).

Many categories in the corpus show prototype effects, but the similarities between the central and peripheral members are apparently less visible. Lakoff’s notion of “**radial category**” proved helpful to give a more accurate account of their organization. In most of these categories, there is one clear prototype, or central subcategory, from which are extended other species, from which are extended other species and so on. In a few categories, though, the prototype is not obvious, but probable.

The logic of these categories is quite variable. In rare cases (ex: [BUG]), the whole chaining from the centre to the most peripheral extensions appears logical. Nevertheless, most often, while the extensions which are closer to the centre can be considered as logical, the most marginal ones appear more surprising (ex: [HEN]). Yet they are never completely arbitrary or absurd: indeed, a form of logic can generally be sensed (large animals like the whale in [COW], wild animals like the bear in [CUB]), although it remains relative. In fact, the motivation relating a subcategory to its extension can depend on a wide variety of aspects (size, shape, way of life, use for humans etc.) which are themselves dependent on human experience and point of view and which can vary from one category to another, but also within a single category, from one member to another.

Finally, a few categories in the corpus have an unclear organization.

- In some of them (ex: [TOM]), the degrees of centrality are obvious, but the links which should connect the most central to the most peripheral members are not directly visible.
- In some other cases (ex: [HATCHLING]), on the contrary, the grouping of species which constitutes the category appears coherent and logical, but the centrality of every species within the category is uncertain.

- In some categories (ex: [JACK]), neither the centrality of the members nor the links between them are quite clear.

As far as these categories are concerned, the different theories of categorization and the research which has been done in this study are not enough to give a precise account of their internal structure.

The question of the structural logic of the various categories in the corpus remains a complex issue: no category is either completely logical, or completely illogical, and the fact that no links are directly visible between some members of a category does not mean that these links do not exist at all. While a number of groupings may appear as not entirely logical, it is worth noticing that some sets of species frequently co-occur as members of a same category. For instance, [GILL] / [JILL] contains hares and rabbits, but also ferrets and animals from the same family: on the face of it, the link between these different species is not obvious, but if one considers the categories [BUCK] and [DOE], one can observe that, among their various members (most of which are quite different from those of [GILL] / [JILL], by the way), they include the very same set of species (hares and rabbits together with ferrets, etc.). This suggests that these different species are not members of the same category by accident, but are connected to one another in a form of logic, although it is not directly visible.

Apart from the internal logic of each individual category, what is also interesting to study is the logic of the categorization system as a whole. The first thing to notice is that the animal kingdom in English is not neatly distributed into a number of definite categories, each one of them containing members that the others have not (as the classical theory claims). For instance, according to dictionary definitions, the male turkey is a member of three different categories ([COCK], [TOM] and [STAG]). And this is the case for many other species, as if categories overlapped one another. On the other hand, there may well be a number of animal species on earth whose male, female and baby can be properly referred to by none of the nouns studied in part III and IV of the second chapter.

Another important thing to notice about the coherence of the categorization system for animals is that the three categories which respectively denote male, female and young animals of a species (for instance, [COCK], [HEN] and [CHICK]) rarely (or even never) form a perfectly coherent family, in which each category includes the exact same species, with the exact same degrees of centrality, as the two others. The main differences between them are generally found among the most peripheral members. Most of the time, the noun denoting the

male of a species contains more diverse members than the nouns denoting the female and the young, but this is not always true (for instance, [PUP] includes sharks, while [DOG] and [BITCH] contain no fish at all). Besides, it should not be forgotten that, while certain differences may be observed in the organization and members of the three categories which refer to the same family, they still share an important number of common points. Nevertheless, these groups of three closely related categories are quite rare in the English system; most categories can be combined more freely. [JACK], for instance, can be matched either with [JENNY] or with [GILL] / [JILL], and [CUB] either with [DOG] and [BITCH], [BOAR] and [SOW] or [BULL] and [COW]. Moreover, since the very same species can often be found in different categories, the few “families” noticeable in the categorization system are frequently dismantled (for instance, a female seal can be referred to as a “cow” and her baby as a “pup” in the same sentence).

As far as animals are concerned, the English categorization system is quite different from the French one. First, while the animal kingdom in English is cognitively structured into a relatively small number of categories, each one of which contains many different species, it is the contrary in French, whose categories are much more numerous but contain relatively few members. For instance, it is clear that in French, no category (apart from very general ones, like [ANIMAL]) contains both the fox and the lion ([CUB]), or the cow and the whale ([COW]), or the bed-bug and the microbe ([BUG]), or any other animal species which are so extremely different. Instead, the French has specific nouns for the male, the female and the young of a wide variety of species (“sanglier” / ”laie” / ”marcassin”, “lion” / ”lionne” / ”lionceau”, “chat” / ”chatte” / “chaton” etc.), which speakers tend to use quite much. In most of these cases, each category only has one member, which corresponds to the animal species focused on. This implies that, in French, “families” of categories are less likely to be dismantled; by the way, most often the nouns referring to the female and the young are built up from the noun denoting the male (ex: “chameau” < “chamelle”, “chamelon”), which shows the strong connection between them. Therefore, nouns which can denote a wide scope of different animal species undoubtedly constitute a specificity of the English categorization system, as compared to the French one.

Nevertheless, surprisingly enough, it turns out that French categories share more common points than expected with English ones.

- For instance, [COQ] includes several bird species apart from the domestic fowl, as [COCK] does (although these species are not exactly the same as in English, and also less numerous). In fact, a number of French nouns denote more than one species, but the structures of these categories are not as complex or diverse as in English. Most often, the number of degrees of centrality within the category is limited and the noncentral members are simply and directly drawn from the central case by extension (for instance, the prototype of [PORC] is the domestic pig, but by extension it is applied to wild species like the wart hog). This implies that the internal logic of French categories is often more apparent than in English.
- Besides, when the adjective “marin(e)” is added to nouns like “vache”, “veau”, “chien” or “chat”, they can refer to other species which can sometimes be found again among the peripheral members of corresponding categories in English. The shark, for instance, is referred to as “chien marin” or “chien de mer” in French, and happens to be a member of the category [PUP] / [PUPPY] in English; likewise, “veau marin” or “veau de mer” refers to the seal, which is also a member of the category [CALF]. Here the comparison between English and French becomes all the more interesting since, on the face of it, such groupings may appear quite surprising (sharks have little in common with dogs, as well as seals with bovines), but the fact that they can be found in the two languages suggests that there is a logical link which connects them and may justify their presence in the same category.
- In extremely rare cases, some categories might even contain more diverse members in French than in English: [ETALON], for instance, includes mammals plus a bird (the cock), whereas [STALLION] only includes mammals.

The complexity of animal groupings in English language, of which this study has attempted to give an account of, would require further researches in order to outline more precisely the network of each category (especially by giving a complete list of all the species which are included into it and specifying exactly their degrees of centrality). To this extent, it would be interesting, for instance, to carry out an experiment like the one led by Eleanor Rosch with American students, asking a number of English speakers to rate the different members of each category from the most to the least representative one. Additional researches would also need to be conducted to determine more exactly the internal logic of the categories, and the various reasons why their members are grouped in this particular way. In order to do so, it may be helpful to change perspectives by considering the various nouns from

a historical point of view, by studying their etymology for instance, or the evolution of their meaning throughout centuries. It is quite interesting to know, for example, that “buck” originally referred to the male goat, which may explain why today the peripheral members of the category can still be “animals resembling deer or goats”, although goats are no longer central to the category (*OED* 2013, entry “buck”). Similarly, it has been observed in the second chapter that “jill” / “gill” and “jenny” were once equally used for the exact same species (the barn owl), which may be one of the reasons why today both nouns are frequently associated with the same noun denoting male animals, “jack”, although their respective members are no longer the same at all. This example suggests that a wider approach taking history of language into account may shed a new light on the relations between the various categories denoting several animal species in the English system, and perhaps also between English and French categorization systems which, as far as animals are concerned, are not as opposed as one may think.

Bibliography

- Corpus of Contemporary English American English*, 2012. <http://corpus.byu.edu/coca/>
- Croft, William and David Alan Cruse, 2004. *Cognitive Linguistics*. Cambridge: Cambridge University Press.
- Dixon, Robert, 1982. *Where Have All the Adjectives Gone?* Berlin: Walter de Gruyter.
- Downing, Pamela, 1977. On 'basic levels' and the categorization of objects in English discourse. *BLS* 3: 475-87.
- Evans, Vyvyan and Melanie Green, 2006. *Cognitive Linguistics, An Introduction*. Edinburgh: Edinburgh University Press.
- Fodor, Jerry A. and Ernie Lepore, 1996. 'The red herring and the pet fish: why concepts still can't be prototypes', *Cognition*, 58, 253-70.
- Gould, Stephen Jay, 1983. *Hen's Teeth and Horse's Toes*. New York: Norton.
- Grand Robert de la langue française*, online edition. Paris : Dictionnaires Le Robert, 2012 and 2013. <http://gr.bvdep.com.sidproxy.ens-lyon.fr/>
- Lakoff, George, 1987. *Women, Fire and Dangerous Things: What Categories Reveal about the Mind*. Chicago: The University of Chicago Press.
- Langacker, Ronald W., 1987. *Foundations of Cognitive Grammar, I, Theoretical Prerequisites*. Stanford: Stanford University press.
- Laurence, Stephen and Eric Margolis, 1999. 'Concepts and cognitive science', in Eric Margolis and Stephen Laurence (eds), *Concepts: Core Readings*. Cambridge, MA: MIT Press, pp. 3-81.
- Osherson, Daniel and Edward Smith, 1981. On the Adequacy of Prototype Theory as a Theory of Concepts. *Cognition* 9, no. 1, 35-58.
- Oxford English Dictionary*, online edition. Oxford: OUP, 2012 and 2013. <http://www.oed.com.sidproxy.ens-lyon.fr/>

Rosch, Eleanor and Barbara B. Lloyd, eds. 1978. *Cognition and Categorization*. Hillsdale, N.J.: Lawrence Erlbaum Associates.

Taylor, John R., 1995. *Linguistic Categorization*, 2nd edition. Oxford: Oxford University Press.

The Free Dictionary: Dictionary, Encyclopedia and Thesaurus, 2013.

<http://www.thefreedictionary.com/>

Wikipedia, the Free Encyclopedia, 2012 and 2013. "List of Animal Names".

http://en.wikipedia.org/wiki/List_of_animal_names

Wikipedia, the Free Encyclopedia, 2013. "American Pit Bull Terrier".

http://en.wikipedia.org/wiki/American_Pit_Bull_Terrier

Wikipedia, the Free Encyclopedia, 2013. "Animal science".

http://en.wikipedia.org/wiki/Animal_science

Wikipedia, the Free Encyclopedia, 2013. "Whitecoat", "Blanchon".

<http://en.wikipedia.org/wiki/Whitecoat>, <http://fr.wikipedia.org/wiki/Blanchon>

Wittgenstein, Ludwig, 1958. *Philosophische Untersuchungen*, trans. G. E. M. Anscombe as *Philosophical Investigations*, 3rd edn. 1999. Harlow, London: Prentice Hall.

Wittgenstein, Ludwig, 1978. *Philosophical Investigations*. Translated by G. E. M. Anscombe. Oxford: Basil Blackwell.

Zadeh, Lofti, 1965. Fuzzy Sets. *Information and Control* 8:338-53.