

The Mental Lexicon and the Architecture of Encyclopedia

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Our linguistic activities presuppose semantic knowledge, which enables not only the construction of sentences but also our “categorization” of things around us. Our investigation of the two models of our structured knowledge-storage, namely: the traditional system of ‘Tree of Porphyry’ and the radial network model, has made it clear that they are in fact not incompatible, as is usually said, and the so-called *mental lexicon* can be said to be a kind of flexible network of ‘concepts’, ‘images’ and ‘propositions’ which connect each other. And we named it *rhizome-like network model*. We concluded that our mental lexicon has at least three types of structure; the hierarchy system of Porphyry, the ‘radial’ category structure, and a system like ‘biological’ network, which we call the Rhizome-like Network.

Keywords: mental lexicon, prototype, encyclopedia, cognitive linguistics, family resemblance

0. The Problem

The purpose of this investigation is to clarify the structure of knowledge stored in our mind through comparing it with the architecture of real lexicons. The concept ‘architecture’ concerns how to select entry terms and how to write each article, and more over how minutely to write it, and how to build the network of cross-reference. Our investigation will move within the presupposition that the knowledge stored in our mind may be similar to an ‘encyclopedic’ knowledge rather than to a dictionary.

Our linguistic activities presuppose semantic knowledge, which enables not only the construction of sentences but also our “construal” of things around us. Recently the problem about how such semantic knowledge, that is, the mental lexicon, is organized has been discussed from various standpoints. There are two opposing models for the architecture of our mental lexicon.

- (1) The traditional system of categorization which consists of genus-species hierarchy, which is often represented with the name of ‘Tree of Porphyry’.
- (2) The radial network of categorization, which can be characterized through the central-peripheral structure and the privileged elements named ‘prototypes’.

Our close investigation of these models has made it clear that these two models are in fact not incompatible, as is usually said, and that the architecture of our mental lexicon may be encyclopedic; the mental lexicon can be said to be a kind of flexible network of ‘concepts’, ‘images’ and ‘propositions’ which connect each other, and at the same time is organizing itself

according to the ceaselessly changing situations.

An American linguist George Lakoff has severely criticized the traditional theory of category in *Women, Fire, and Dangerous Things, —What Categories Reveal about the Mind—* (1987). His criticism against the traditional categories system consists of three main elements;

- (1) Wittgenstein's argument of "family resemblance",
- (2) the theory of 'prototype', and
- (3) 'radial categories'.

Although we may agree with the main tenet of cognitive linguistics but we should make some opposing arguments against the three threads of Lakoff's theory of categorization because we can find some misunderstandings. In the following we may argue against the three threads of his theory by turn. The necessity of discussing about this problem lies in the fact that he made such an attempt to criticize and destroy the traditional theory of categories which has come down from ancient Greek philosophy. And his misconception which we will show clearly in the following comes from his misunderstanding of a different culture. Our discussion about it will necessarily lead to the problem concerning the structure of our mental lexicon.

1. Family Resemblance

According to Lakoff, "the classical category has *clear boundaries*, which are defined by common properties. Wittgenstein pointed out that a category like *game* does not fit the classical mold, since there are no common properties shared by all games. —Though there is no single collection of properties that all games share, the category of games is united by what Wittgenstein calls *family resemblances*" (Lakoff, 1987, p. 16). Wittgenstein proposed a famous argument against the classical theory of category using of the concept "family resemblance" in *Philosophical Investigation*, I. 65–71.

66. Consider for example the proceedings that we call "games", I mean board-games, card-games, ball-games, Olympic games, and so on. What is common to them all? — Don't say: "There must be something common, or they would not be called 'games' — but look and see whether there is anything common to *all*. —For if you look at them you will not see something that is common to all, but similarities, relationships, and a whole series of them at that."¹

He insists that the things that are called 'game' share no common feature at all. In the following part of section 66, Wittgenstein examined whether the members of the group called "games" have common features or not. The examples which he listed as games are:

¹ Ludwig Wittgenstein, *Philosophische Untersuchungen*, English & German, translated by G.E.M. Anscombe, 2nd ed., 1953, Blackwell, Oxford, p. 31.

1. board-game
2. card-game
3. ball-game
4. Olympic game
5. chess
6. noughts-and-crosses
7. patience
8. children's ball playing
(A child throws his ball at the wall and catches it again.)
9. tennis
10. ring-a-ring-a-roses

After 'looking and seeing' all games without thinking, so he ordered us, Wittgenstein concluded that there are no common and overlapping characters among them. But we must examine the validity of his conclusion.

Of course, we must admit that it is very difficult to define the meaning of any word. If someone gives a certain definition to a single word, for example, the general nouns for natural kinds and artifacts, we can always find exceptional things that deviate from the prototypical things in a certain way. Yet, is it reasonable to think that there are not any common features between exceptions and the typical individual examples? If any common features could not be recognized at all, we can suppose such an entity as an exception would lose its ground for being called as 'exception'. In the case that some entity is recognized as an 'exception' of a certain species, there must be some more 'generic' scheme according to which it can be recognized as an individual example of the same category and but at the same time an 'exceptional' one. In this sense we can insist that when we use some 'general' noun, we must constitute by ourselves a certain general notion with which we can categorize the things that should belong to the group which is indicated by it.

Wittgenstein's mistake seems come from at least two grounds; (1) the ambiguity of the German word 'Spiel', and (2) his method to consider only the superficial appearance of the members.

First, concerning (1), the word "Spiel" must be translated into the two English words; *game* and *play*. The German word has a very different nuance from *game*. The complex word "Spielraum" means 'room to move', 'clearance' in a technological sense. In this case such "Spiel-" designates by no means any game, rather '*play*'. Although, as a matter of fact, this fact does not affect validity of his argument, we should select the general word as an example carefully when we want to investigate the validity of categorization. Ironically, the word 'Spiel', is a very important and indispensable word because in his book *Philosophical Investigations* he proposed the famous concept 'Sprachspiel'. But the word 'Spiel' were very ambiguous and impossible to circumscribe definitely, so we should conclude that his semantic theory using a vague concept is necessarily not accurate and allow some different, even conflicting interpretations.

And then concerning (2), we must point out the fact that in general our categorization

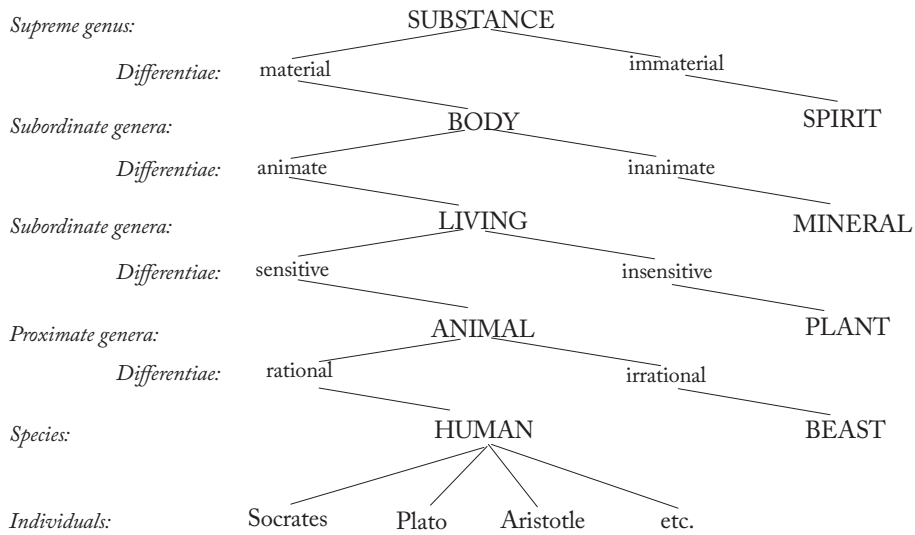
does not always depend upon the similarities and resemblances which we can find among the various appearances of things, animals, artifacts and events. As already Lévi-Strauss pointed out that some primitive tribes relate the sensual qualities of things to the inner characters and mechanisms within them, and they classify natural things together which seem to us to be belonging to quite different categories.² For example, people of a Siberian tribe count 'a beak of woodpecker' as an effective healing means for acute pain. When one feels acute pain in his tooth, they believe, he would feel better by touching the beak of any woodpecker. We can guess that they probably associate the sensuous quality of the acuteness of the sound of the bird's pecking with their inner feeling of acuteness of a toothache. Primitive people are very sensitive about the similarities among natural phenomena, and at the same time they seek any underlying, not apparent relationships behind them. So we can suppose that they have their own 'scientific' theory about the causal mechanism of the whole nature. At the stages of the mythical and magic thought as "bricoleur"³ they create their own device to explain the relationships between natural things and regularity of nature. The point of Lévi-Strauss' analysis is that when they classify things, they do not consider and describe only the surface resemblances of things, but go further to build a causal theory which appears to us to be very strange and therefore difficult to understand reasonably. Nonetheless the difference between the scientific thinking of civilized people and the mythical, magic thinking by "primitives" is not definite, rather gradual. Semantic system of every language may contain the traces of mythical, magic thinking, which goes back further to the ancient ages. So we can conclude that our categorization, at any stage of intellectual activities from primitive level to modern scientific level, relies upon the cooperation between perceptive cognition and conceptual theory-conjecture.

Additionally, we must point out that the problem of the classical theory of categorization, which we can find in the *Metaphysics* of Aristotle, lies by no means in the fact that there are not any common overlapping features among the members of a category, but in the very fact that it is impossible to find the necessary and sufficient definition for a certain 'general' noun. We can find very easily the common character that all the members share. For example, such a description as "a kind of human activity" holds good even for all activities that Wittgenstein pointed out as 'games'. But, of course, such a description is so broad that it indicates many other human activities. Therefore, the hard problem of the classical categorization is how accurately and efficiently with *differentiae specifica*e to define a category.

As well known, the classical system of ontology is often represented as a tree, which is called *Tree of Porphyry*. See FIGURE 1,

2 Cf. Claude Lévi-Strauss, *La pensée sauvage*, 1962, Librairie Plon, pp. 20–26.

3 *Ibid.*, p. 30.

FIGURE 1: Tree of Porphyry⁴

This is an English translation of *Tree of Porphyry*. According to this tree, we can define the species 'HUMAN' through its proximate genus 'ANIMAL' and differentia 'rational'. As Umberto Eco has already pointed out, this tree consists of two different elements, i.e. the concepts, SUBSTANCE, BODY, LIVING, ANIMAL, HUMAN, which are all expressed by 'general nouns', and the concepts 'differentiae specificae', which are linguistically expressed as adjectives.⁵ In principle such adjectives can be applied to any entity that would have an appropriate quality which the adjectives mean. In other words, there would remain endlessly a possibility that the definition of a certain species, which consists of 'proximate genus' and 'differentiae specificae', could not define a species accurately. For example, the definition of HUMAN, 'animal rationale' should be changed when a German Psychologist Wolfgang Köhler, in *Intelligenzprüfungen an Menschenaffen* (1921), observed chimpanzees could take a bunch of bananas hung from the ceiling with their own hands using a wooden stick as a tool, just as a human being, and concluded that some kind of anthropoids have 'intellectuality', even though their intellectuality remains within the *practical* field. If the concept 'rationality' could mean even such 'practical intellectuality', the traditional definition of HUMAN should be done away with immediately. So we can say classical definitions always have such a possibility of widening and narrowing, because adjectives with which 'differentiae specificae' are expressed mean some universal properties and characters, which cannot define the corresponding 'species' precisely. Is this an unconquerable fault of the whole system of classical categorization? We do not think so. We think the fundamental scheme of the classical theory of definition is correct, but we should build up a new theory of our 'real' categorization, which permits a possibility of widening and narrowing one already made. There is an old philosophical proverb, *individuum*

4 John F. Sowa, *Knowledge Representation—Logical, Philosophical, and Computational Foundations*, Course Technology, Cengage Learning, Boston, 2000, p. 5.

5 Umberto Eco, *Semiotics and the Philosophy of Language*, 1984, Indiana University Press, p. 67.

est ineffabile, but according to our considerations, even ‘species’ as well as ‘individuum’ is ‘ineffabile’ to the extent that we could not define it once for all.

Umberto Eco has rightly concluded that the whole traditional system of categorization can be maintained now. Pointing out that the notion of ‘specific differentia’ conceals a contradiction; a ‘specific differentia’ is an ‘*essential accident*’⁶, which means such an attribute that is ‘accidental’ property in the sense that is not necessary for being what it is in principle, and at the same time that is ‘essential’ in the sense that ‘necessary’ for accurately defining what it is in principle, he called attention to the fact that Thomas Aquinas, in *De Ente et Essentia*, has given “the most striking answer” to this problem. Consider the following paragraph of Chapter V of *De Ente et Essentia*;

Since in these substances [=created substances] the quiddity [=essence] is not the same as existence, these substances can be ordered in a predicament [=category], and for this reason we find among these things genera, species, and differences, although their proper differences are hidden from us. In sensible things even the essential differences are unknown to us, and so they are signified through accidental differences that arise from the essential ones, just as a cause is signified through its effect. We take bipedality, for example, as the difference of man. The proper accidents of immaterial substances, however, are unknown to us, and thus we can signify their differences neither per se nor through their accidental differences.⁷

In this paragraph Aquinas asserts that because the essence of a created substance is not the same as existence, though in the case of God his essence is existence, such substances can be arranged in a category system, which for him can be quite different from the real, proper structures of created entities. The classical hierarchy system of genera, species, and differences is for us a device to predicate substances. He definitely asserts that the essential differences of sensible things are ‘hidden’ (*occultus*), ‘unknown’ (*ignotus*). Because ‘essential differences’ among created sensible things are quite hidden for us, so we cannot predicate them without using the terms ‘accidental differences’. Why are such ‘specific differences’ ‘accidental’? We, mortal and finite entities, cannot recognize the real and essential structures accurately. Therefore the appearances of created things seem to us ‘accidental’, i.e. having no enough reason to occur or appear. Aquinas explains the relationship between the accidental differences and the essential differences by means of ‘signification’ (*significatio*). Eco interprets it from the semiotic viewpoint as follows;

Essential differences cannot be known directly by us; we know (we infer!) them by *semiotic means*, though the effects (accidents) they produce, and these accidents are the sign of their unknowable cause.⁸

6 *Ibid.*

7 Cf. English Translation: <http://www.fordham.edu/halsall/sbook.html> and Thomas von Aquin, *De ente et essentia*, Lateinisch/Deutsch, übersetzt und herausgegeben von Franz Leo Beieretz, Philip Reclam jun. Stuttgart (1979), S.60–61.

8 Umberto Eco, *ibid.*, p. 67.

We already asserted that, as result of our considerations upon Lévi-Strauss' theory of categorization and classification by primitive people, our categorization, at any stage of intellectual activities, relies upon *the cooperation between perceptive cognition and conceptual theory-conjecture*. Now just after the examination of Aquinas' theory of essence and existence, we can conclude that when we classify and categorize things we, mortal and finite entities, 'infer' or 'conjecture' the hidden structures of things, as well as observe the surface resemblances and similarities.⁹ As Norwood R. Hanson already regarded even a seeing as a 'theory-laden' undertaking,¹⁰ the perception of similar phenomena should presuppose a kind of conceptual theory-conjecture. We cannot classify things without inferring the hidden structure and the latent mechanism from their apparent similarities and regularities. So we can name our own theory "Theory-Theory" in the methodology of categorization.

2. The Very Idea of 'Prototypes'

Now we must discuss the following question; Does the "Theory-Theory" concerning the methodology of categorization necessarily lead to the Prototype-theory?

The argument of 'family resemblance', i.e. "The idea that members of a category may be related to one another without all members having any properties in common that define the category",¹¹ is always connected to the notion of "prototype". In contrast to the classical theory of categories, according to the prototype theory some members of a category may be "better examples" of the category than others, and such members function as *core* members which have *centrality* within the category. When one is asked what is remembered first after hearing common noun of a category, he always remembers a 'prototypical' example of it. According to the 'prototype'-theory, the set of members of a category has central-peripheral structure. In concrete, an individual member of a category, or subcategory of a category may function as "the prototype". According to that prototype-theory, the prototypical members can exert the power to generate the network which links further more peripheral members of a category. According to the classical system of category, many categories are listed at the horizontally same level, for example HUMAN and LION are the same ranked categories while HUMAN and MAMMAL are not so. The category system which has been generated by various ways of extension from the *central* member, namely 'prototypical' example, is probably a 'radial' network system of category.

The prototype theory has been developed by Eleanor Rosch. Through her experiments, she has discovered that all members of a category do not have an equal status as category members, and found that there are asymmetries among them. Her research began with the cognition of 'color term', and further she applied her theory to other concepts, for example categories as BIRD, CHAIR.

9 Cf. Thomas von Aquin, *De ente et essentia*, Lateinisch/Deutsch, übersetzt von Franz Leo Beeretz, Philip Reclam ju. Stuttgart (1979), S.60–61. English translation: <http://www.fordam.edu/halsall/sbook.html>.

10 Norwood Russell Hanson, *Patterns of Discovery—An Inquiry into the Conceptual Foundations of Science*, Cambridge University Press, Cambridge, 1958, p. 19.

11 Lakoff, 1987, p. 12.

1. Robins are judged to be more representative of the category BIRD than are chickens, penguins, and ostriches.
2. Desk chairs are judged to be more representative of the category CHAIR than are rocking chairs, barber chairs, beanbag chairs, or electric chairs.

It is not so astonishing that in our so-called ‘mental’ lexicon all members of a category do not have the same ‘weight’, or the same ‘importance’, but each member has its own practical ‘relevance’. It depends upon the experience of subjects or upon the cultural environment which member is the core, central member of the category. It is very doubtful for Japanese people that robins are more representative than are chickens, because the Japanese word TORI, which corresponds to the English word BIRD, means directly chickens, and even the meat of chickens, therefore psychological association between TORI [=BIRD] and chickens is very strong in the case of Japanese. So we must say that the organization of categories within the system of our mental lexicon is thoroughly influenced by the individual experiences and social and cultural conventions of the linguistic community.

Now we consider retrospectively our arguments. We have dealt with the critique against the classical category theory. According to our consideration we can assert that our categorization relies upon the cooperation between perceptive cognition, through which we perceive the similarities and regularities of appearance, and conceptual conjecture through which we would infer the deep, and hidden structure and mechanism behind it. We named this theory “Theory-Theory”. And then examining Thomas Aquinas’ typical ‘scholastic’ theory of category, we found that he might support our idea. From the line of our discussions we should not necessarily abandon the opinion that all members of category might share the same common features. So the possibility to give an appropriate definition to any general noun remains for us. If it were totally impossible to define common words, real dictionaries would be useless and never helpful.

So we must examine the next question: *Is our Theory-Theory really compatible with ‘Prototype’ Theory?*

First we must point out that Rosch, the first who found the prototype-effects in the field of cognitive psychology, later gave up the thought that prototype effects directly mirror category structure, i.e. mental lexicon, and that prototypes constitute representations of categories.¹² We do not think it is necessary to abandon the prototype theory as well as the thought that members of a category only show ‘family resemblance’ and do not share common properties. Prototype effects are rather symptoms for a certain hidden structure of our mental lexicon, although they are not the direct mirrors of it. They reflect a certain structure of the category network in our mind.

Even Lakoff admitted that prototype effects are ‘superficial’;

They [prototype effects] may result from many factors. In the case of a graded category like *tall man*, which is fuzzy and does not have rigid boundaries, prototype effects may

¹² Lakoff, 1984, p. 43.

result from degree of category membership, while in the case of *bird*, which does have rigid boundaries, the prototype effects must result from some other aspect of internal category structure.¹³

According to the 'prototype' theory, members are placed in a certain position within the whole network of the category in virtue of their similarity to the prototype; the closer a member to the prototype, the more central its position within the network. Therefore we can say there is a close relationship between the concept of 'prototype category' and the concepts of similarity or resemblances. While there is some difference of opinions concerning its interpretation among cognitive linguists, John R. Taylor is of a quite original opinion which few other cognitive linguists share. He states as follows;

- (1) The presence of 'essential' attributes, which are necessarily shared by all members of a category, is consistent with the prototype approach.
- (2) The existence of a clear boundary of a category does not preclude prototype categorization.

We can say that these assertions, which are fully compatible with the classical theory of categories, are the results from his very careful and deep consideration upon the phenomenon of *prototypicality*. He has pointed out rightly some following characters;¹⁴

- (i) Similarity is a graded concept.
- (ii) Things are similar to the extent that a human being, in some context and for some purpose, chooses to regard them as similar.
- (iii) Prototypicality is recursive, in that the very attributes on whose basis membership in a category is determined are more often than not themselves prototype categories.

We can name these assertions respectively (1) *gradualness of similarity*, (2) *context-dependence of similarity* and (3) *recursiveness of prototypicality*. We must explain especially the third one. It means that it is dependent upon the prototypicality of attributes to determine what is prototypical in a category. In other words, prototypicality of things within a category presupposes recursively that of attributes. These characters including the other two are all negative ones to the extent that from them it comes as conclusion that only with the concept of 'prototype' we cannot explain definitely the mechanism of our categorization. It gives room to other factors in it. The network of categories which we use in daily life contains in itself not only organization of prototypicality but also the classical hierarchy system and 'essentiality' of attributes. As already discussed, 'prototypes' emerge at various levels from sensual superficial perception to higher activity of conceptualization, in which the mental act of our 'theory-conjecture' plays its core role.

¹³ *Ibid.* p. 45.

¹⁴ John R. Taylor, *Linguistic Categorization, Prototypes in Linguistic Theory*, Clarendon Press, Oxford, 1989, pp. 60–61.

3. Radial Categories

As we stated before, according to 'prototype' theory, because members are placed in a certain position within the whole network of the category in virtue of their similarity to the prototype, such a system of category network can be represented as 'radial'; The next figure is the network system of category BIRD.¹⁵

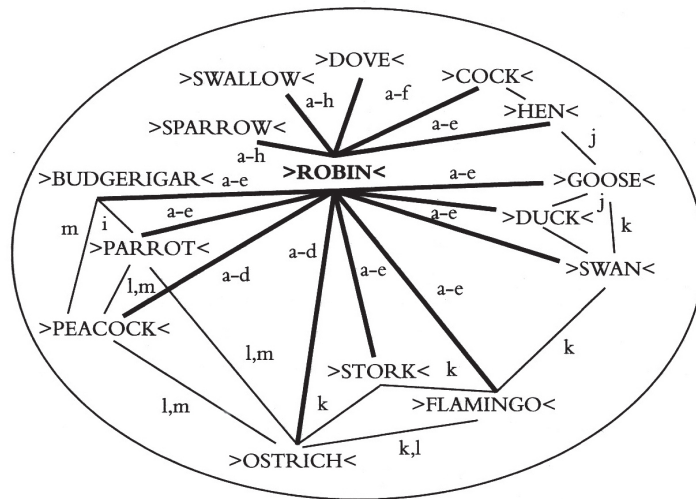


FIGURE 2: Radial Category of BIRD

The letters (a)–(d) in FIGURE 2 indicate category-wide attributes (selected), as follows.

- (a) lays eggs
- (b) has a beak
- (c) has two wings and two legs
- (d) has feathers

And then the letters (e)–(m) refer to family resemblance attributes (selected).

- (e) can fly
- (f) is small and lightweight
- (g) chirps/sings
- (h) legs are thin/short
- (i) kept in a cage
- (j) reared for the use of its meat, eggs and feathers
- (k) has long neck
- (l) has decorative feathers
- (m) has exotic colors

15 F. Ungerer and H.J. Schmid, *An Introduction to Cognitive Linguistics*, Longman Limited, Harlow England, 1996, p. 27.

When we consider the above FIGURE II as an example of architecture of the category network, we can find two kinds of lines in it. Bold lines stretch from the prototypical bird, ROBIN, to other types of birds which are placed on the periphery. The other type of line is the one that connects the species which share common non-central attributes. The difference of lines consists in the difference of the status of attributes within the category. The thin lines indicate the 'accidental' attributes that are situated on the periphery. On the other hand, the bold lines represent the central attributes, which make the core character of all the things of the category. So we can state that such a difference means the same difference between the 'accidental' and 'essential' attributes in the classical ontology of categories that has originated in the metaphysics of Aristotle. Therefore, agreeing with Taylor's opinion, we can conclude that the notion of 'prototype' theory might be compatible with the classical notion of category.

But George Lakoff adheres very strongly to the notion of the lack of common properties, which is often asserted with Wittgenstein's argument for family resemblance. And according to his theory of categories, both notions of 'prototype' and 'radial category' are essentially connected with the negation of common properties. In his book, *Women, Fire, and Dangerous Things* (1987), Lakoff tried to verify his own theory by examining the two examples: 'classifiers' in an Australian 'native' language, Dyirbal, and 'counters' in the counting system of the Japanese language. Dyirbal has four 'gender'-like classifiers, according to which all nouns are classified into four groups, (i) male, (ii) female, (iii) edible and (iv) other things. In the language, *women*, *fire* and *dangerous things* belong to the second category. After the general principle of cognitive linguistics, Lakoff thinks such classification was 'cognitively' motivated, and that there might be a certain mechanism of cognition by which 'women', 'fire' and 'dangerous things' fall all into a category. His argument about 'classifiers' of Dyirbal has some contradictory elements. He emphasizes the cognitive *motivation* of the classification by 'classifiers', and on the other hand, after his assertion of "family resemblance", such classification does not necessarily depend upon the cognition of some common properties among members, even in our case of '*women*', '*fire*' and '*dangerous things*'.

Lakoff's arguments are based on the research of Dyirbal by R. M. W. Dixon. He states with Dixon the following conclusion;

Categories on the whole need not be defined by common properties. There is no reason to believe that the Dyirbal find anything in common among women, fire, dangerous things, etc. Nor do they assume, so far as is known, that there is anything feminine about fire or danger, or anything fiery or dangerous about women. On the other hand, common properties seem to play a role in characterizing the basic schemas within a given category (edible plant, human male, human female)¹⁶.

Against their theory, we must first argue that the classification by means of 'classifiers' in Dyirbal is not a genuine 'categorization', and for the same reason why the counting system of 'counters' in Japanese is not a genuine 'categorization'. Some researchers argued that the system of 'classifiers' of Dyirbal is a 'much less exotic' system of genders, and only the

¹⁶ Lakoff, 1987, p. 96.

combination of ‘formal’ and ‘semantic’ cues can explain Dyirbal’s gender assignment.¹⁷ When we want to deal with the problem of gender assignment, we must consider semantic features of such phenomena but also ‘morphological’ and ‘phonological’ elements. So we must say that it is misleading to extend the results from the considerations upon the ‘classifiers’ to other categorization systems.

Interpretations of ‘classifiers’ of Dyirbal by Lakoff as well as the research by Dixon are not totally mistakes but they contain some very instructive insights. One of them is the following principle;¹⁸

If some noun has characteristic X (on the basis which its class membership is expected to be decided) but is, through belief or myth, connected with characteristic Y, then generally it will belong to the class corresponding to Y and not that corresponding to X.

Lakoff has named this description by Dixon “the myth-and-belief-principle”, which seems for us to support our “Theory-Theory”. While the ‘characteristic X’ might be an apparent, and superficial one, on the other hand, the Dyirbal people classify things after not so apparent, but more influential character things rather after another which originated in *belief* or *myth*. Already in the earliest ages of our history, when the modern natural sciences have not yet developed, we had a tendency to classify and categorize things from the viewpoint of a certain theory of hidden mechanism. But this tendency is only one of the cues for categorization. Of course, whenever we must categorize our ordinary things, a certain practical interest imposes constraint upon assignment of category. And some apparent elements of ‘similarities’ could play an important role in categorization. Although we cannot deny this fact, but the role and function of similarities and resemblances are limited ones. For example, although human beings and mannequins resemble each other very closely in their appearance, we never put them together into a certain category. And we very rarely categorize real dogs together with stuffed dog-toys in one category, even though such toys are so finely manufactured that we might mistake them for real animals seeing in the distance.

4. The Network of Mental Lexicon and the Encyclopedic Knowledge

As we have already stated, we have some linguistic knowledge in our mind with which we choose appropriate words and could construct sentences. Such knowledge consists not only of ‘semantic’ concepts but also ‘pragmatic’ knowledge which enables us to use words. Concerning the characteristics of linguistic knowledge, there has been a controversy between the two different opinions in the field of linguistics.

One of them is that our linguistic knowledge, including our lexical knowledge, is a module ‘isolated’ from other knowledge in our mind. According to this ‘module’ theory of mental lexicon, our linguistic knowledge is taken as a kind of ‘expert’ knowledge. But, as we have already realized, our system of categorization contains various strata of knowledge, which

17 Cf. Keith Plaster and Maria Polinsky, Women are not dangerous things: Gender and categorization, *Harvard Working Papers in Linguistics* 12, 2010.

18 Lakoff, 1987, p. 94.

is a flexible network made of 'tree'-like system of categorization and 'radial category' system and, possibly other types of relationships between categories.

The other opinion is that our mental lexicon is 'encyclopedic' to the extent that it contains not only definitions of words as dictionaries do, but also further knowledge about the things which it denominates in various domains and even literary, historical fields. And as entry terms and their descriptions are related with each other through the network of cross-reference. Langacker maintains the 'encyclopedic' view of mental lexicon by analyzing the concept [BANANA].¹⁹ For example, the very fact that we can talk of *a bunch of bananas* rests on our knowledge of how bananas grow, how they taste, how to peel them. And the shape, color, and nutritional value of bananas are probably quite central to the concept 'banana'.²⁰ The 'encyclopedic' view of mental lexicon means that once the things have been recognized, the knowledge of them get organized and stored in the mind in the manner of 'encyclopedia', and our mental lexicon is built after the architecture of 'real-world' encyclopedia.

Before further discussing our 'encyclopedic' view of the mental lexicon, let us examine what information real-world encyclopedias and dictionaries contain. Encyclopedias register not only 'truths', whether they are historical truths or literary truths, but also what has been said about the truth, what has been believed to be true, and even what has been believed to be false or imaginary or legendary.²¹ As an example, we consider the article of CAT in *Compton's Encyclopedia and Fact-Index*.²²

Cat

- The Anatomy of the Cat
 - The Head and Body
 - The Legs and Feet
 - Male and Female
- The Cat Breeds
 - Differences in Body Type
 - Breed Colors
 - Breed Organizations
- A Cat's Life History
 - The Birth of a Kitten
 - How Cats Develop
- Choosing and Caring for a Cat
 - Choice: Purebred or Domestic?
 - Choice: Kitten or Cat?
 - Adjusting to a New Home
 - Feeding Your Pet
 - Grooming

19 Ronald Langacker, *Foundations of Cognitive Linguistics I*, Stanford University Press, 1987, p. 154.

20 Cf. John R. Taylor, *Cognitive Grammar*, Oxford University Press, 2002, p. 440.

21 Umberto Eco, *Semiotics and the Philosophy of Language*, Indiana University Press, Bloomington, 1984, p. 83.

22 *Compton's Encyclopedia and Fact-Index*, Vol. 4, Compton's Learning Company, Chicago, 1997, pp. 201–217.

Training
 Some Diseases of Cats
 The Cat in History
 Cats in the Ancient World
 Cats in the Medieval World
 Cats in the Arts
 The Cat Family
 The Cat in Literature
 Fiction
 Nonfiction

From the above article, we see it contains various kinds of knowledge about cats, for example, anatomical, zoological contents and practical knowledge for breeding cats, and religious history of cats in the ancient world, and ‘literary’ and ‘legendary’ knowledge of cats. The description of the article ‘CAT’ shows a very wide spectrum from theoretical, scientific knowledge to the mythical, or practical, literary knowledge.

In comparison, let us see the article of CAT in dictionaries, first in *The Merriam-Webster Dictionary* (6th, 2004).

CAT noun

- 1 a carnivorous mammal long domesticated as a pet and for catching rats and mice
- 2 any of a family of animals including the domestic cat
- 3 a malicious woman
- 4 GUY

Next, *The Concise Oxford Dictionary of Current English*, 9th. 1995.

CAT noun

- 1 a small soft-furred four legged domesticated animal, *Felis catus*.
 - 2 any wild animal of the family *Felidae*, e.g. a lion, tiger, or leopard
 - 3 a catlike animal of other family (civet cat)
 - 4 *colloq.* a malicious or spiteful woman
- 5 – 8 are idiomatic explanations give precise references in all cases

The first few descriptions are definitions. But they do not coincide in these two dictionaries. In the former (1) ‘carnivorous’, (2) ‘mammal’ and (3) ‘domesticated’ are listed, while in the latter (1) ‘furred’, (2) ‘four legged’, (3) ‘domesticated’ and (4) ‘small’ are listed. There is only one common property contained in both dictionaries: ‘domesticated’. We could point out that the description of *Concise Oxford Dictionary* 9th is not a sufficiently delineating definition of CAT, because such a definition does hold good even for DOG. The description in *Merriam-Webster*, on the other hand, can be said to be a more accurate definition because of the additional attribute “for catching rats and mice”, which characteristic dogs do not share, as far as we know. Such ‘behavioral’ characterization comes from our experiential contact with cats in daily life, and can be called a kind of ‘encyclopedic’ knowledge.

In fact, some encyclopedias contain the definition in the article. The article of CAT in *Encyclopedia Britannica* 2005 begins with the following explanation;

(family *Felidae*), any of a group of carnivorous mammals that includes the true cats—lion, tiger, jaguar, leopard, puma, and domestic cat—and the cheetah. Cats typically have soft fur, often strikingly patterned.

It is worth noting that articles in encyclopedias often begin with some ‘definitional’ description of the entry. In this sense, we agree with Langacker’s statement that there are not clear distinctions between dictionaries and encyclopedias. So we can conclude that only with the support of wider ‘encyclopedic’ knowledge about the category, such as CAT or DOG, we can understand such definitions and use them in linguistic performance.

5. Conclusion

As we have just seen, ‘narrow’ ontological definitions can be effective only when referring to the wider background knowledge, which is often called ‘common sense’. If we take such knowledge as our linguistic lexicon, we must say that the organization of its inner structure is very complex, and might be constructed after the following principles: the hierarchy system of Porphyry, the ‘radial’ category structure, and a system like ‘biological’ network, which we call the Rhizome-like Network, shown in FIGURE 3. In the rhizome-like network, knots are connected with each other flexibly, just as the entries of real-world encyclopedias are connected with each other through *cross-references*.

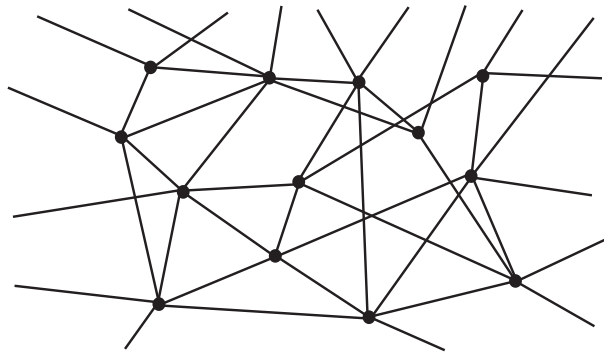


FIGURE 3: Rhizome-like Network

According to the article of “encyclopédie” by Diderot, the coeditor of *Encyclopédie* 1751–1780, there are four kinds of the references that are used in it, as follows;²³

- i. Material references
- ii. Verbal references

²³ See the article of “encyclopedia” written by Diderot, the coeditor of *Encyclopédie* 1751–1780, the English Translation in: <http://quod.lib.umich.edu/d/did/>.

- iii. References by juxtaposing certain relationships, analogous qualities, or similar operations
- iv. Satirical or epigrammatic references.

Material references connect words which occur in an article with the objects which have close relationships and are listed as terms in *Encyclopédie*. Verbal references are used in it in order to avoid repetition of word's definition. The third sort of references is very interesting especially for us, who have discussed the design and the structure of our mental lexicon, and according to Diderot is "the work of a man of genius" in the same sense, I believe, as Aristotle remarked, "the greatest thing is the use of metaphor. That alone cannot be learnt; it is the token of genius." (*Poetics*, 1459a) It needs a kind of 'fanciful conjectures' in order to build a certain combination or connection among things that apparently lack any significant relationship. The fourth sort of references is quite special ones, which the editor of the 'universal dictionary' or 'encyclopedia' uses as tools when he intends to express a kind of meta-comment or his own interpretation about things or events.

Very acutely contrasted to d'Alembert's conception of hierarchical system of human knowledge, Diderot held a very flexible concept of the structure of 'the universal dictionary' (Encyclopedia) as follows;

A universal dictionary of the sciences and arts needs to be thought of as a vast countryside containing mountains, plains, rocks, water, forests, animals, and all the objects that make the variety of a great landscape.²⁴

According to Diderot, the universe provides us only with infinite individual entities, virtually lacking 'any fixed and definite division'. Everything in universe is connected, and throughout the uniform immensity of objects, some break through the calm surface and rise above it just like the tips of rocks. Diderot seems to think there must be a kind of similar structure between a universal dictionary and the universe, and we would like to add more, namely; our mental lexicon, or in other words, *our mental encyclopedia*.

Though Diderot compared the encyclopedia with 'a vast countryside' as a metaphor, Deleuze & Guattari, in their *A Thousand Plateaus* (1980)²⁵, they named 'a data representational system' made from multiple, non-hierarchical entry and exit points "Rhizome" and analyzed such a 'rhizomatic' system. "Rhizome" means properly botanical entities as 'creeping rootstalks' or 'rootstocks.' It is characteristic for such entities that if they are separated into pieces, each piece may be able to give rise to a new plant.

They list up the features of 'rhizomes' as follows;

- (i) Principles of connection and heterogeneity

"Any point of a rhizome can be connected to anything other, and must be. This is very different from the tree or root, which plots a point, fixes an order".

²⁴ *Ibid.*

²⁵ See G. Deleuze & F. Guattari, *A Thousand Plateaus*, Minnesota UP, 1987, Chapter 1. Introduction: Rhizome., pp. 3–25 (originally published as *Capitalisme et Schizophrénie, tome 2: Mille Plateaux*, Editions de Minuit, 1980).

(ii) Principle of multiplicity

“A multiplicity has neither subject nor object, only determinations, magnitudes, and dimensions that cannot increase in number without the multiplicity changing in nature”.

(iii) Principle of asignifying rupture

“A rhizome may be broken, shattered at a given spot, but it will start up again on one of its old lines, or on new lines”.

(iv) Principles of cartography[the art of mapping] and decalcomania[the art of tracing]

“A rhizome is not amenable to any structural or generative model. It is a stranger to any idea of genetic axis or deep structure.” A rhizome should be a map and not a tracing. Because the map is open and connectable in all of its dimensions; it is detachable, reversible, susceptible to constant modification. And “the rhizome always has multiple entryways”.

As we have described, according to Deleuze & Guattari, the rhizome-like network is a flexible system, and any part of it can be connected to any other one, and has neither center-periphery structure nor top-bottom multi layered structure, but has multiple entryways. We can say that the connection lines that are constitutive of rhizome-like networks are symbols for the cross-references in our mental lexicon. The rhizome-like mental lexicon is a very flexible and open network system, and therefore we might conclude that our mental lexicon has at least three types of system or structure; the hierarchy system of Porphyry, the ‘radial’ category structure, and a system like ‘biological’ network, which we call the Rhizome-like Network.

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