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Table of Contents

Chapter 3 Language and Memory

3.1   Process models for long-term memory

3.1.1   Net models. The model of Quillian

3.1.2   Proposition models. The model of Anderson and Bower.

3.1.3   The model of Meyer

Chapter 4   Experimental study of the semantic models of 'prototype' and 'family resemblance'

4.1   Theoretical ground

4.2   Introduction to the experimental method

4.3   Experiment I

4.3.1 Data analysis

4.3.2 Discussion

4.4   Experiment 2

4.4.1   Data analysis and Discussion

4.5   General discussion

4.6 Contributions of the study

4.7 Limitations of the study

4.8 Summary of the thesis

    References

Introduction

In order to make sense of the world, human beings tend to make categorization. According to Smith (1990), what humans categorize in the sense of psychology are objects that are believed to belong together. In addition, they form concepts. Cognitive linguistics is concerned with categorization on two levels. These are linguistic categories like words, morphemes, nouns that are used to describe the objects of investigation, and categories which are described by the linguistic categories (Taylor, 1995). It is believed that categories and concepts are structured and organized for instance, ranging from simple to complex and taxonomically (Murphy, 2002).Cognitive psychology has been formulating and experimenting a battery of models of theory of concepts and categorization with a core assumption that human's theories of the world embody conceptual knowledge and that their conceptual organization is partly represented in their theories. One model among the theory of concepts is the prototype theory.

The prototype theory is a product of cognitive psychology that was presented in 1970s mainly due to Rosch's research of the internal structure of categories (Murphy, 2002; Geeraerts, 1989).

The prototype theory still remains a dominant theory in cognitive linguistics which needs to be further explored since it is considered to be one of the three cognitive linguistics's fundamental tenets with schemas and basic level categories (Ungerer & Schmid,1996; Taylor, 1995; 2002; 2004).

This research is inspired by Rosch's theory of basic level categories that claims that such a level is basic in respect of perception, function communication and knowledge organization. Basic level words are the most neutral and shortest in the category, knowledge of the category is organised around them, and what is an important feature is that such knowledge is usually acquired earlier than that of superordinate and subordinate category members.

The dissertation is organized in 4 chapters. The first three chapters are dedicated to literature review whereas the fourth chapter describes and discusses the experimental study of the semantic models of prototype and family resemblance.

More specifically, Chapter 1 aims at defining different concepts of meaning and its representations according to the dominant frameworks of linguistics and psychology. Chapter 2 introduces the main ideas and the theoretical concepts of cognition. Chapter 3 explores the specific topic of meaning processing and memory storage. Chapter 4 is dedicated to the research. Two experimental procedures are designed and carried out. The main goal of the two experiments is to test the prototype effects within categories and groups of speakers of English as a native language and English as a second language. It is hypothesized that among the language learners, there will be less asymetry within the category than for the native English speakers. It is also considered that subjects who are foreign language learners will provide similar prototypical effects over a number of categories as native speakers.

The hypothesis is that a broader range of category members will be produced by English learners. It is also expected that there will be cultural and geographical differences too as the English learners are Greek and reside in Greece, and the native English speakers are British and reside in the UK.

The aim of this research is to investigate whether subjects who are foreign language learners will provide similar prototype effects over a number of categories as native speakers.

In the field of Second Language Teaching, it can certainly be said that basic level words are the ones which are taught first. But are they retained any longer the subsequently taught lexical items from the superordinate and subordinate categories? There are cases of second language users who develop highly sophisticated subordinate level terms, who do not know very common superordinate level terms.

Chapter 1
Meaning and thought

The meaning and representation of meaning

Semanticists have spent vast periods of time contemplating the 'meanings of meaning'. Causal theorists pay attention to the role of speakers and hearers; whatever is relevant to meaning should be accessible to observation.

C.K. Ogden and I.A. Richards, in their book 'The meaning of meaning'(1923) list as many as twenty-two definitions of the word meaning , taking different non-theoretial starting points. Their list is designed to show the confusion and misunderstanding that arises due to lack of agreement about the term.

Geoffrey Leech, in his book 'Semantics'(1974) presents seven types of meaning:

1. Conceptual meaning
2. Connotative meaning
3. Social meaning
4. Affective meaning
5. Reflected meaning
6. Collocative meaning
7. Thematic meaning

Leech notes the importance of considering meaning as neutral between the 'speaker's meaning' and the 'hearer's meaning'.

People talk in order to express the meaning of their thoughts, and they listen in order to discover the meaning of what others say. Of course the meaning of words vary with place, time and situation.

Linguists have tried to explain meaning in natural language by:

a. defining the nature of word meaning
b. defining the nature of sentence meaning
c. explaining the process of communication

When considering meaning it is essential to consider that there are three types of knowledge:

1. semantic knowledge
2. pragmatic knowledge
3. real world , or common sense knowledge

Semantic components

The sense of a word can be said to have three basic characteristics:
1. It is a bundle of elementary semantic components.
2. The components themselves are propositions , each consisting of a predicate and one or more arguments
3. These propositions are formally identical to those used to represent sentence meaning.

Componential analysis

These three characteristics are basic to the semantic analysis method of componential analysis. In carrying out this form of analysis one must first select a domain of seemingly interrelated words, then form analogies among the words within a domain, then finally identify the semantic components based on these analogies.

A good example is the domain man, woman , boy , girl :

man : woman : : boy : girl

which can be expressed thus :

Man	Woman	Boy	Girl
+ Male	- Male	+ Male	- Male
+ Adult	+ Adult	- Adult	- Adult
Remainder	Remainder	Remainder	Remainder

the component 'remainder' could be called +human.

This notion is not very precise , however, as the relationship patterns are not clear , so other notations have been formed to take into account relations between the words.

One drawback of the semantic component approach is that many subtleties of meaning are left out. In fact several arguments have been put forward against the validity of componential analysis as a practical tool for the study of word meaning. Lyons (1981) concludes that the empirical validity of such analysis is 'more apparent than real'.

Components that have wide applicability, as they are not tied to classes of objects or events are components representing <u>charge</u> , <u>cause</u> and <u>negation</u>.

Quantificational representation

The quantificational approach to meaning is quite different from that of componential analysis.

Using this method, a group of subjects would be asked to judge some aspects of meanings of words in a particular semantic field. The judgements would then be analysed by means of highly sophisticated mathematical process, such as:

<u>Factor analysis</u> $\rightarrow$ an early approach used by Osgood, Susi and Tannenbaum(1957) to try to measure the emotional reactions words elicit, that is affective meaning. It has proved useful in studying attitudes and emotional reactions, it has not really been successful in explaining how word sense is involved in comprehension, production and acquisition.

<u>Multi-dimentional scaling</u> $\rightarrow$ which is related to the notion of the more recent semantic space, that is the meaning is taken to be a location in physical space, in which each dimension represents one of the word's semantic components. In this method subjects are shown all possible pairings of words within a semantic domain. Subjects rate how similar the words in each word pair on a scale of 1 to 10 are. Average ratings for each pair are entered into a

computer programme, which is designed to find a semantic space in which the closer in similarity the two words are, the closer they are in space.

<u>Cluster analysis</u> → S. Johnson (1976) devised this method. Subjects are asked to rate all word pairs within a domain for their similarity in meaning, producing a hierarchical arrangement of clusters. Words within clusters are closely related, and the clusters themselves are related to each other in a hierarchy.

The Quantificational approach was developed for three reasons:

1. These methods are more 'objective'.
2. Semantic fields about which the investigator had no clear intuitions could be investigated.
3. The ability to deal with components of meaning that were continuous rather than discrete.

Semantic fields

Semantic fields are not necessarily closed and well defined sets, as some theorists, particularly structuralists consider them to be, according to Antonopoulou (1987).

Chapter 2
Language and Thought

Universals and relativity

Language is shaped by people's processing capacities, it must reflect ideas, and it is affected by social and cultural systems since it is a communication tool within such a system. Language could be said to influence and shape many aspects of our daily lives.

Linguistic Universals and linguistic relativity are two areas of study which take up these ideas. Every human language needs to be susceptible of being learned by children, spoken and understood easily by adults, embody ideas and function as a communication system. These are universals of language. However, if languages are moulded by accidental features of thought, technology and culture, there are bound to be differences between languages. Conversely, if language moulds people's ideas and culture, these language specific features should lead people who speak different languages to think differently.

Perceptual categories

To understand the connection between language and other cognitive abilities, it is necessary to consider universal features deriving from the human capacity to organise and categorise perceptual information. The Sapir - Whorf hypothesis put forward the concept that the language we speak perhaps suggests or even determines how we perceive the world. The features of language that are universal could be termed complexity of expression. The more complex the expression, the more complex the thought reflected. Greenberg (1966) used two criteria to show how categories of thought (usually two contrasting categories) is more complex or 'marked'. These criteria are added morphemes , that is if expression B consists of expression A plus an added morpheme , then B is more complex than A , for example dog and dogs.

The second criteria is contextual neutralisation , by which Greenberg meant that if expression A can neutralise in meaning in contexts that the

almost equivalent expression B cannot, then B is more complex than A. For example <u>actor</u> , <u>actress</u>.

Such criteria has been used to study colour terms.

Category naming.

It appears that when people want to refer to an object, even if it has many different names , they use the most basic level word .

Berlin et al (1972 , 1973) used the following hierarchy to illustrate how people divide up objects within categories.

Unique beginner	e.g. plant
Life form	e.g. tree
Generic name	e.g. pine
Specific name	e.g. Ponderosa pine
Varietal name	e.g. Northern Ponderosa pine

Berlin et all argued that the generic level is the most basic. They are the first learnt by children.

It has been found that many languages have the same basic terms for shape names and spatial terms.

Concepts and categorisation.

The dividing up of the world, or classifying, does not appear to be random. Categories tend to form around perceptually salient points in the domain.

Theories of conceptual categorisation have been expounded since Aristotle. The classical objectivist theory maintains that for an entity to be a member of a category, it must fulfill necessary and sufficient conditions.

Wittgenstein (1953) challenged this view of categorisation, observing that not all categories are defined in terms of common properties, citing the concept game as an example. As some games involve luck , others skill , some have the aim of winning , while others are for sheer enjoyment , it is impossible to give a single definition of the word 'game'. It is the family resemblance

between category members , i.e. similarities , that contribute to understanding a concept such as 'game'.

 'Prototype theory' was fully developed by the psychologist Rosch and her associates in the 1970s and early 1980s following on from Wittgenstein's work and the work by Berlin and Kay on colour terms.

Prototypes can be seen as category members having a special cognitive status within a category , being considered the best example of a particular category (e.g. 'best' bird). There are some drawbacks and limitations of prototypes and family resemblance.

Problems with 'prototypes' and 'family resemblance'.

Problems involved in specifying a prototype include the fact that there is a huge diversity of characteristics making up a prototype. Properties of a prototype involve both identification criteria and stored knowledge, between which a distinction needs to be made. It is difficult to know what criteria subjects are using in their decision making. There appears to be a clash between two criteria, moreover we do not know exactly how identification criteria are interwoven with stored knowledge in the minds of speakers.

An added problem is that while some prototypes are based on the human perceptual system (e.g. colour terms) others depend on location and cultural aspects.

Further problems occur in attempting to arrange characteristics of a prototype in order of importance. Moreover there is the problem of separating out the meaning of a word from the situation in which it occurs. The way in which we perceive and identify things cannot entirely be removed from our stored knowledge of them.

It has been considered by Lehrer (1990) whether prototype theory can be applied to any and all types of word. Most work has been done with 'kinds' notions. Despite the drawbacks and limitations of prototype theory and family resemblance it does appear that the theory remains valid.

Semantic   Categories

Cognitive and linguistic psychologists are concerned with not only identifying the prototype of a category but with the dimensions along which others in the category vary from the prototype. Perceptual dimensions such as shape and size have been identified. Different methods such as circle and wave diagrams have been used to illustrate the range from the most to the least prototypic examples of a concept.

Rosch 's Theory

Rosch have ever used a different method of illustration sharing three levels from the most abstract to the most specific .i.e.

Superordinate	e.g. tree
Basic	e.g. oak
Sub-basic (or sub-ordinate)	e.g. Californian live oak

Basic level categories were established by Rosch et al as basic in four respects : perception , function , communication and knowledge organisation . Basic words are the shortest most commonly used and most contextually neutral of the words in the category.

Rosch's most important contribution to the development of prototype theory is her evidence of prototype effects and basic level effects within or category, showing asymmetries among category members and asymmetric structures within categories.

Rosch's early work concerned colour categorisation finding the prototype or 'best' red within the red category . She extended her research to categories of physical objects. Rosch and Mervis (1981) postulate the hypothesis that categories are maintained as discrete by being coded in cognition in terms of the prototypes of the most characteristic members of the category. A concrete image of an ''average'' category member is coded in the mind.

Rosch, as Wittgenstein did before her, maintains that there are no necessary and sufficient conditions required for category membership. Rosch and Mervis (1975) formulate the hypothesis that category members are prototypical to the extent that they bear a family resemblance to other members of the same category. On the other hand items seen as most prototypical of a particular category are those with least family resemblance to (or membership of) other categories. This is the idea of cue-validity. Rosch observed that categorisation depends largely on the nature of the system in which the category is embedded.

Lakoff's theory

Lakoff sees the best approach to cognitive semantics as what he terms 'experientialist cognition' , by which he means ''basic sensory-motor , emotional , social and other experiences of a sort available to all human beings- and especially including innate capacities that shape such experience and make it possible''(Lakoff 1987).

Lakoff's main thesis is that knowledge is organised by means of structures 'idealised cognitive models' or ICMs and that category structure and prototype effects are by-products of that organisation.

Each ICM is a complex structured whole which uses four kinds of structuring principles.

1. Propositional structure.
2. Image schemantic structure.
3. Metaphorical mapping.
4. Metonymical mapping.

Each ICM structures a mental space. Lakoff himself is unable to define the exact notion of ICM. The ICM is his substitute for the notion of prototype in order to explain the nature of lexical categories. They try to capture both our intuitions on what happens when we use language and how the minds operates in using it. They provide a theoretical framework for bringing together semantic and pragmatic aspects of linguistic communication.

Similarity and meaning

Similarity provides a means by which people classify objects , create concepts, make generalisations, create , and interpret metaphores and similes. It is an essential element of the formation of prototypes and categories.

Models of similarity include Nosofsky's context-based model and Tversky's contrast model.

Tversky's contrast model

Tversky looks at the role played by common and distinctive features , the relations between judgements of similarity and differences , the notion of asymmetric similarities and the effects of context on judgements of similarity. The model is also used to analyse the relations of prototypicality and family resemblance.

Tversky's contrast model is based on 5 assumptions:

1. Matching
2. Monotonicity
3. Independence
4. Solvability
5. Invariance

Features of similarity

According to Tversky (1977), the salience of a feature is determined by two types of factors:

1. Intensive -factors which increase intensity, or signal to noise ratio.
2. Diagnostic -factors which refer to the classificatory significance of features.

Clusters, according to Tversky (1977) are usually selected so as to maximise the similarity of the objects in the cluster, and dissimilarity of objects from different clusters. This relation between similarity and grouping is called the diagnosity hypothesis .

When an object set is enlarged, not all previously shared features will be valid within the new set. These features then gain diagnostic value and increase the similarity of the objects that share them.

Thus, the similarity of a pair of objects in the original context will usually be less than their similarity in the extended context. Tversky (1977) termed this the extension effect. Tversky asserts that similarity has two faces: causal and deductive.

Asymmetry and focus

According to Tversky (1977) there is symmetry wherever objects are equal in measure or 'assessing the degree to which a and b are similar to each other'. However if assessing the extent to which a is similar to b, then the task is directional and so symmetry may not be present.

With directional tasks, a is the subject, and focus of the comparison, while b is the referent. The features of the subject are weighted more heavily than the features of the referent, i.e. $a > b$.

The focusing hypothesis ($a > b$) implies that the direction of asymmetry is determined by the relative salience of the stimuli - i.e. the less salient feature is more similar to the salient stimulus than vice versa.

The nature of 'prototypicality' and 'family resemblance'.

Prototytpicality can be seen as a proximity relation that holds between an object and a class. An object is prototypical if it intuitively exemplifies its category (Tversky 1977). He asserted that common features of objects are weighted more heavily in judgements of prototypicality than in judgement of similarity.

Wittgenstein's 'family resemblance' theory (1953) referred to a network of similarity relations that link the members of the category. Tversky considered that category resemblance is 'a linear combination of the measures of the common and the distinctive features of all pairs of objects in that category'(1977).

A recent development in linguistic semantics is a new type of semantics termed **cognitive semantics** which tries to break the former 'objectivist' mode of philosophical, psychological and semantic thinking. What were criterial features to the early modern semanticists and early modern researchers into semantic development are to cognitive semanticists:

- image- schemata
- cognitive models
- mental spaces
- natural, human procedures to extent and transform schemata , such as metaphor and metonymy.

Chapter 3
Language and Memory

Process models for long-term memory

The most important of these newer models are:

    a) the *separate-store models* developed during the 1960s .

      This helps us to distinguish between short-term store (STS) and long-term store (LTS).

    b) the *levels-of-processing* in the early 1970s.

      This is an approach to the understanding of memory.

    c) the *semantic-network models* which have become very popular.

      According to this approach, memory is best thought in terms of complex structures, or networks, of interrelated information.

Network models

N.M are composed of nodes, which are linked together. The nodes represent concepts, and the links represent the relations between the concepts. The relations are specific (e.g. 'has a' or 'is a') and the directions of the relations are specified too- for example, a bird is a mammal, but not vice versa. Information is retrieved from the network by searching through the various relations.

There are two kinds of nodes:

Type nodes- define a particular concept (e.g. bird)

Token nodes- particular instances of that particular concept (e.g. the robin you saw on your way to work.


The Adaptive Control of Thought (ACT) model was proposed by **John Anderson in 1983**.

ACT is also a network model, so it has nodes and links. However, the nodes and links are put together into **propositions.**

The propositions represent the general thoughts that people have experienced, rather than the specific pieces of information experienced, because people tend to remember the gist (or essence) of their experiences but the specifics, (e.g. the exact wording) may be forgotten.

Parallel Distributed Processing Models (PDP)

PDP models are also known as connectionist models, because they involve connections between units of input and output, and **neural net** models, because they are asserted to better represent actual neural (brain) processing than previous network or stage models. In the PDP model, memories are not localized to one particular place, or node, as in network models. Instead, memories are represented as *patterns of activation*. The activation is between input units and output units.

I---------W-----------O

(input)   (output)
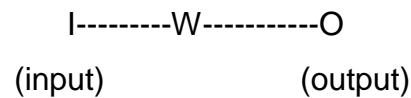
Four kinds of semantic-network models will be considered:

      1) Hierarchies

      2) Matrices

      3) Feature Models

      4) Spreading-Activation Models

A number of authors including **Collins and Quillian (1972)** have claimed that the best way of thinking about the structure of lexical memory is in terms of hierarchy.

As we will see in the following diagram, according to the model of Collins and Quillian, the concept *animal* is broken down into *birds* and *fish*, which, in turn ,are broken down further. Characteristics of a particular word at a particular level are stored with that word. It should be noted that if a given word at a given level has a certain characteristic, then all other words below that word in the hierarchy have that same characteristic.

The Marker-Search model. (Glass and Holyoak, 1975) is a model in which concepts are arranged in a network, each concept being associated with a defining marker, or markers, representing properties. Relations of entailment hold between the markers so that the defining marker for ' bird' (avian) can be said to dominate or entail the markers (feathered) and (animate).

Some investigators think of lexical memory in terms of hierarchies while others in terms of *matrices*.

Broadbent, Cooper and Broadbent (1978) compared the hierarchical scheme and the matrix scheme. Their technique was to present the same list of words in either a hierarchy, a matrix or a random order and then test for recall. They found that *both* the hierarchy and the matrix facilitated recall relative to the random control but that they did not differ from each other.

Feature Models

This approach investigates how we categorize nouns when they are presented to us. **J P Houston (1977/81/86)** uses the example of the canary. If the word canary is presented to us, the question is what determines how long it will take us to decide whether canary belongs to the category bird.

In the hierarchy and matrix approaches, the speed of this decision is determined by such factors as how close the target and prime are to each other in some arrangements of words.

In the feature approach, the number of features or attributes that *canary* and *bird* have in common plays the major role in our decision rather than any notion of spatial arrangement

Spreading-Activation Models

This semantic-network system introduces new ideas and it is not limited to hierarchical relationships. The original spreading – activation model was presented by **Collins and Loftus (1975).**

What can be noticed first is that **the words which are stored in this network are connected in many more ways than a simple hierarchical configuration**

Psychologists often express sentence meanings by use of an adapted version of semantic networks, known as *propositional representations.*
Semantic networks contain propositional nodes, which represent the meaning of simple sentences.

Propositional representations share the same problems as early network models

    1. They are unable to handle quantification,

    2. They lack of clear semantics and

    3. lack of an account of how two expressions in a particular text can be recognized as referring to the same individual

One of the most thorough attempts to show that propositions are units of memory has been made by J. Anderson and Bower (1973). They carried out a long series of studies and provided much evidence for the propositional nature of memory.

In one study, Anderson and Bower proved that when a proposition is demonstrated in new sentences on successive lists to be recalled, it helps in that recall.

The Human Associative Memory model (HAM) was developed by Anderson & Bower in 1973 is a network model which is concerned with the propositional structure linking concepts rather than the individual concepts themselves. It models the interface between episodic and semantic information in which particular episodic inputs are mapped onto pre-existing long-term semantic structures.

While the principal concern of network models is to represent the storage of information, set-theoretical models of semantic representation (or attribute models as they can be termed) such as the one proposed by Meyer (1970), are used to explain the comprehension of quantified statements, like 'All robins are birds' (some S are P). Each concept is represented by a set of elements which includes its descriptive features and properties, and the names of its supersets and subsets.

In 1970 Meyer proposed the PIM model which is a 2-stage process for retrieving information from a set-theoretical model, whose aim is to explain the differences in response time to judge true and false statements with different quantifiers (the all-some difference).

Chapter 4

Experimental study of the semantic model of 'prototype' and 'family resemblance'

The experiments are based on the developments of Rosch, who developed the idea of basic level categories. I am interested to see whether non-basic vocabulary items learnt subsequent to basic terms are retained or not.

What is considered in the experimental study is whether subjects who are foreign language learners will provide similar prototypical effects over a number of categories as native speakers. My hypothesis is that a broader rage of category members will be produced by English learners. It is also expected that there will be cultural and geographical differences too.

Categories chosen are:

> **vegetable , fruit , building , clothing , tree , furniture , flower , vehicle , bird , animal , sport , jewellery , disaster , non-alcoholic drink , alcohol.**

These terms represent the superordinate level of the category.

The claim by Hatch and Brown (1995) that 'prototypes are named first when subjects are asked to give examples of members of concept' forms the basis of the method.

The subjects were divided into two groups of 36 :

1. A random selection of English native speakers, residing in England.
2. Greek students of English of Intermediate level , residing in Greece.

Subjects were asked to state the first example that they thought of each category. The data from the experiment was collected and each item within a category was given a percentage rating according to the number of subjects who gave the item as their response.

The data was then arranged by category in the manner of Rosch, demonstrating divisions between superordinate, basic and sub-ordinate levels. When the verbal information has been collected from the subjects, for each group, native speaker and learner, the 3 most popular and the 3 least popular responses will be collated for each category and for each group of subjects. A further two groups of 10 native English speakers and 10 learners will be given these items in list form, and asked to rate the items as to their typicality of the category in question, as a scale of 1 - 10.

Subjects were given 5 seconds to respond with an example of a category member. In the case of the English learners, if a subject was not able to respond within 5 seconds, they were asked about the next category.

The findings from the experiment were collated and each item within each category was given a percentage rating according to the number of subjects who gave the item as their response. In this manner the most popular responses and therefore, it seems, the prototypes for each category are indicated. The data was then arranged by category in the way that Rosch used, demonstrating the divisions between superordinate, basic and subordinate levels :

Analysis of data by percentage, to find the prototypical member of each category.

(Here is a part of the experiment that was conducted)

NATIVE SP = N.S.   ENGLISH LEARNER = E.L.

<u>VEGETABLE</u>   <u>FRUIT</u>

<u>N.S.</u>	<u>%</u>	<u>E.L.</u>	<u>%</u>	<u>N.S.</u>	<u>%</u>	<u>E.L.</u>	<u>%</u>
Carrot	36.1	Tomato	48.3	Apple	44.4	Apple	34.4
Potato	30.5	Carrot	13.9	Banana	16.6	Orange	21.8
Onion	13.9	Lettuce	10	Orange	16.6	Banana	15.6
Cabbage	13.9	Cauliflower	6.9	Pineapple	5.5	Cherry	6.2
Pepper	2.8	Asparagus	3.4	Plum	5.5	Watermelon	3.1
Aubergine	2.8	Cucumber	3.4	Pear	5.5	Grapes	3.1
		Onion	3.4	Strawberry	5.5	Melon	3.1
		Soup	3.4			Peach	3.1
		Salad	3.4			Strawberry	3.1
						Lemon	3.1
						Pear	3.1

Analysis of data into superordinate, basic and sub-ordinate levels within categories (Fig. 2).

<div align="center">V E G E T A B L E</div>

<u>N.S.</u>

<u>Superordinate</u> :	Vegetable
<u>Basic</u> :	Carrot, potato, cabbage, onion, pepper, aubergine
<u>Sub-ordinate</u> :	-

<u>E.L.</u>

<u>Superordinate</u> :	Vegetable
<u>Basic</u> :	Tomato, carrot, potato, lettuce, cauliflower, asparagus, cucumber, onion
<u>Sub-ordinate</u> :	Soup, salad

F R U I T

<u>N.S.</u>

<u>Superordinate</u>	:	Fruit
<u>Basic</u>	:	Apple, banana, orange, pineapple, pear, plum, strawberry
<u>Sub-ordinate</u>	:	-

<u>E.L.</u>

<u>Superordinate</u>	:	Fruit
<u>Basic</u>	:	Apple, orange, banana, cherry, watermelon, grapes, melon, peach, strawberry, lemon, pear
<u>Sub-ordinate</u>	:	-

The findings are certainly interesting, and perhaps surprising, in a number of ways.

First of all, for all categories, and for both groups (native speakers and learners) clear prototype effects have emerged. In only one case is there a tie for 'first position', i.e. supposedly the prototype.

In some categories, prototype effects are more prevalent than in others. In the categories for the learner group the following categories have strong prototypical effects.

My hypothesis was that the prototype effects within the categories for the learner group would show less asymmetry. I was interested in the view put forward by Hatch and Brown (1995) that even though basic words are the first to be taught, and possibly retained the longest, that subsequent vocabulary of a more superordinate or sub-ordinate nature would not necessarily be quickly forgotten.

 The findings of the second experiment are as follows:

(Here is a part of the experiment that was conducted)

All figures are expressed as a percentage possible rating of 100% of the top possible rating of 100%

Fig. 3

Category :   Vegetable

N.S.	%	E.L.	%
Carrot	97	Tomato	98
Potato	89	Carrot	91
Cabbage	80	Potato	81
Onion	74	Onion	54
Pepper	21	Cauliflower	45
Aubergine	10	Cucumber	18

Category :   Fruit

N.S.	%	E.L.	%
Apple	100	Apple	96
Orange	85	Orange	94
Banana	85	Banana	79
Pear	58	Lemon	64
Pineapple	34	Peach	52
Plum	20	Watermelon	38

The aim of the second experiment was to validate the findings of the first experiment. This aim has been achieved.

In each category , both English learner and native speaker grours of subjects largely agree with the subjects in the first experiment regarding the three most and the three least 'popular' responses , that is , the three most 'popular' members of each category are the most 'popular' in the second experiment , as are the three least 'popular' category members.

In each category, the 'prototypical' member of the category remains the same after both experiments.

There are, however, some important points to note from the findings. In some of the categories, the rating of 1-10 given to items do not always correspond with the percentage of response in the first experiment.

Contributions of the study

The contributions of the study are the following :

1. The empirical study of this research demonstrates the strengths and weaknesses of E.Rosch's theory of 'prototype' and 'family resemblance'.

2. The author systematizes numerous research studies in psychology and linguistics which focus on how mind stores and represents verbal information.

3. The theoretical analysis represents the new direction in cognitive semantics that shows how linguistic and psychological knowledge is closely connected.

4. It proves how human associations are highly shaped by individual traits such as interest, culture and geographical place.

Limitations of the study

The number of participants is limited.

Additionally, we need to take into consideration the personal preferences of the participants in the formation of prototypicality.

A more sophisticated statistical analysis could have taken place and the results could have been presented in graphs.

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