

**A Study on Students' Categorizing  
Abilities and the Implications for  
Vocabulary Teaching in a Private  
Training School in China**

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## 1. Introduction

There is an infinite variety of factors in the process of language learning and teaching. The question arises as how we translate all these variables into operation in the actual second language learning settings. Among them, one of the most important factors that affect second language learning is categorization. There are different kinds of categorizing abilities such as categorization of entities, linguistic categorization and so on. This essay will mainly deal with linguistic categorization since it is an important factor in vocabulary learning.

One aspect of linguistic categorization refers to the process by which people necessarily categorize the world around them when they use language. It happens everywhere in our daily life even though we may not realize it. We are undertaking acts of categorization when we use the word *dog* to refer to two different animals or describe two different colour sensations with the same word, for example, *red*.

Modern cognitive psychologists hold the belief that when we construct our own understanding of the world, we first set a cognitive goal of finding the similarities and differences. Therefore, categorization is the fundamental approach in achieving this goal. For instance, science could be classified into social and natural categories; school subjects could be classified into art and science categories; the information on the Internet is classified as news, sports, entertainment and many other categories. Even the drawers in your house might be classified according to their function or other means. To some extent, we believe that the categorizing ability is a symbol indicating individuals' intelligence.

This belief sheds some implications on the field of education. The question arises as to whether there is a correlation between students' categorizing abilities and academic achievements. The concept of categorization covers a wide range, but this paper mainly focuses on linguistic categorization since it is a study in the field of second language learning and teaching. A study is designed using two different kinds of tests to compare students' linguistic categorizing abilities and their academic achievements and three research hypotheses are put forward:

1. Students' linguistic categorizing abilities vary.
2. Students of a higher proficiency group are more capable of linguistic categorization.
3. Linguistic categorization helps the students in their learning process.

### ***1.1 Aim***

The main aim of the essay is to test the three research hypotheses put forward and to compare two groups of students in terms of their linguistic categorising abilities and find out if there is a relationship between the students' linguistic categorising abilities and their academic achievements. The hypothesis is that the students of the higher academic achievement group are likely to show a stronger linguistic categorizing ability.

### ***1.2 Material and Method***

Different materials are employed in the research study of students' categorization abilities and its relationship with their academic achievements. Altogether, there are 120 subjects taking part in the research and they are tested using two kinds of tests. One is used to gain access to their categorizing abilities and the other is used as a national test to evaluate the students' English proficiency as a second language.

#### ***1.2.1 Tests***

Two different types of materials were employed in this study: (1) Two tests, which are labelled as test (A) and test (B). (2) A national English Exam for students of PETS-2 (Public English Testing System) in China.

The participants were required to write down their names in the first type of test so that the results can be compared with their language academic proficiency, but when their data was put into the computer, their names were replaced by serial numbers and I am the only person who has access to the data, which means that their anonymity is protected.

Both of the two differently designed tests are in English and each of them consists of two sections. In section One of Test 1, twenty words were shown to the students according to their categories on a screen at the same time at the front of the classroom by a computer projector. The students were given one minute to memorize the words and then asked to write down what they had remembered. The words are classified by their prototypes of fruit, subject, furniture and transportation. It is as follows:

**Fruit:**     *orange lemon apple peach pear*  
**Subject:**   *English Chinese math PE music*  
**Furniture:**   *sofa bed mirror table cabinet*  
**Transportation:** *car jeep taxi ship plane*

Easy words were chosen for each category so that the participants were familiar with the target words. All the 20 words have appeared in the level one text book, so that word storage was not a factor that would have influenced the objectivity of the collected data. Instead, memory, which is an important step in vocabulary learning, was the essential factor. The participants were not required to memorize the superordinate words for each category. They served as a reminder to help the participants remember the categories of the given words. Moreover, the layout of the words is clear, with four lines of five words, which was designed to facilitate the memorization. Although uneven number of letters per word may affect recall, the fact that the students are familiar with the words can minimize such an effect.

Section One of the second test showed the same 20 words which were in a random order, it was as follows:

*English car cabinet peach orange*  
*Sofa jeep PE lemon plane*  
*Pear taxi ship apple music*  
*Chinese bed music mirror table*

The random order of the twenty words was aimed at achieving the comparison between categorized words and uncategorized words.

The second section of both tests was identical. The same twenty words from different categories were shown as follows:

*play for but move rice*  
*banana Shanghai well high low*  
*a the had came been*  
*first do can does doing*

The participants were required to categorize every word semantically or grammatically according to their own understanding. They are not told exactly in what ways should they categorize the 20 words because that might give them some clues on how to finish the task. Since the focus was on categorizing abilities, they were allowed to use Chinese to name each of the categories. It is noticeable that unlike the first 20 words in Section One, the words in Section Two are more grammatically different. This section was designed like this purposely because it is fair to the students in the uncategorized group since the first section of the test may provide the students in the categorized with some clues on how to categorize words semantically.

When it comes to the second part of the material, it is a nation-wide examination for the testing of English language abilities in China. It is conducted by the national educational bureau and it is believed by most English teachers to be a reliable examination to test citizens' English proficiency. The total grade of the examination is 100 and it covers the tests of vocabulary, grammar, listening, reading, speaking and writing. People who achieve scores between 80 and 100 are considered to be highly proficient English speakers. The mid-proficiency group has scores between 60 and 80. Test takers under the score of 60 are considered to have a low proficiency.

### **1.2.2 Participants**

The subjects of the study were 120 students from five classes of PETS-2 in a private English training school in Ningbo, China. Since it is a private English training school, there is a wide range of students' ages and they are from all walks of life. The subjects from PETS-2 classes were chosen on purpose because they had at least passed the examination of PETS-1 level and were on the intermediate level of English learning. The factor that the five classes were selected randomly increases the reliability of the study for the reason that there are great variations among the students' academic proficiencies, class placements, genders, personalities and interests. Thus, the subjects of the study are representative.

The 120 samples were divided into high, middle and low proficiency groups according to their scores in the National English Examination of PETS-2. The subjects with scores between 80 and 100 belong to the high proficiency group. The middle proficiency group had scores from 60 to 80, and the scores of low proficiency group were under 60. The subjects were classified in this so that multi-sample analyses can be carried out.

### **1.2.3 Procedure**

The procedure of the research mainly consists of two parts – the procedure of the actual test and the analysis of the data collected. In this section, how the tests were carried and scored, as well as how the data were collected and analyzed will be explained in detail to provide readers with a clear view of the whole research study.

#### ***1.2.3.1 The Procedure of the Test***

The subjects were divided into two groups, Group A and Group B. The students of Group A were shown Test 1 while Group B students were shown Test 2. The whole test was conducted by one of my colleagues in the private training school who is in charge of PETS-2 teaching curriculum. I explained the whole procedure of the test to him in detail and made sure that he understood it correctly before he actually carried out the test.

Firstly in the testing procedure, the purpose of doing the tests was explained. Clear instructions about the procedure of the tests were given to avoid misunderstandings and minimize confusion. Then an answer sheet was handed out to each of them and they were asked to write down only their names on the answer sheet. After that the first part of the test, which was the first 20 English words, was shown on the screen at the front of the classroom by a projector, the subjects had one minute to memorize them. They were not allowed to write down the words during that one minute. The timing started once the twenty words were shown on the screen. The subjects were left one minute to write what they had remembered. After the first section of the test, the second section was shown on the screen and the subject were required to categorize the twenty words in section 2 within three minutes. The answer sheets were then handed in and scored.

### ***1.2.3.2 Scoring***

The scoring of the two different parts of the test is different due to their different contents and testing purpose. The scoring of the first part of the test is quite objective. One word counts as one point and the highest score is 20. The answer is considered correct only when the student writes down exactly the same word that appeared on the screen.

On the other hand, the nature of the second part of the test is more like a questionnaire. Since different people categorize words in various ways, it is quite hard to predict what categories will appear on the answer sheets. Thus, it is difficult to provide the right answer before hand. As a result, a word was counted as categorized if the category name that was given was reasonable. The second part of the test didn't involve scores. In this part, the focus was on how many categories appeared on the answer sheets. After that, the data collected were matched with the subjects' names and then all data were fed into the computer using Microsoft Excel.

### ***1.2.3.3 Data Analysis***

The data collected from the test was compared and analyzed both on the general level and the detailed level. A comparison was carried out between the categorized and uncategorized groups as well as between the high, mid and low proficiency levels.

In order to have a detailed view of the students' performance in the two parts of the test, two forms of presenting the data, efficiency tables and frequency tables (diagrams of frequency tables), were utilized. The efficiency tables show the minimum, maximum and average scores that students achieved in the test thus allow us to see the overall picture of the students' performance. On the other hand, the frequency tables show the number of students achieving different scores and allow us to have closer access to the data and analyze it in detail.

## **2. Theoretical Background**

How human beings deal with the words and their relationships with the real world has been a subject of interest for hundreds of years. The study of categorization can be traced back to ancient times since Aristotle. Modern linguistics have also put a large amount of effort into this area, which gives rise to fruitful findings.

In this section, different scoring methods are introduced first because they are closely related to test reliability and this study research is based on the data collected from a test. After that, the definition of categorization will be dealt with, followed by the two major trends in the field of categorization. Section 2.4 mainly concerns with the prototype theory, which is the dominant theory of categorization now and has proved useful in explaining how students categorize English words.

### ***2.1 Test Reliability and Scoring***

Scoring has long been considered as an essential part of a test. Gradually, people come to realize that not only the test takers' performance determines the results of tests, how a particular test is scored is also an essential factor which can influence test scores. Hughes (2003:44) puts this in a more formal way in his book *Testing For Language Teachers*. He sees the reliability of scoring as one of the most important components of test reliability and points out that scoring reliability can be improved in various ways.

Scoring methods are also regarded as one of the priorities in testing by Bachman and Palmer (1996:193-229). They have a chapter in their book dealing with this particular issue. The reason why methods used to arrive at scores are crucial is that in most cases test users actually test scores to make decisions. Teachers use test scores to see if students has mastered what has been taught, not to mention that in national tests, scores can decide what kind of schools you can be admitted into. Thus, the process of scoring is closely related to insuring that test scores are reliable and that uses made of them are valid.

Deciding what scoring method to use in a test is not an isolated problem from other aspects of a test, but rather an integral part of the whole design of the test. Among them, what kind of test it is and what the test user wants to test are two important factors. Bachman and Palmer (1996:194) defines it as the “intended response”, that is to say, what kind of response the test users want to elicit from test takers has clear implications on scoring. Tasks intended to have a limited and selected response can generally be scored objectively, while tasks that require students to have limited or extended production have to be scored subjectively (Bachman & Palmer 1996:194). For example, test items like multiple choice and dictation are usually scored objectively while test items like short answer questions are often scored subjectively because the latter requires students to produce longer utterances and it is difficult to provide a set of correct answers.

Objective scoring is usually preferred by test users because the items have clear correct answers, which makes it much easily scored according to an established answer key. Moreover, no judgement of scorers is involved during the process of scoring, which eliminates the subjectivity involved in scorer judgements and makes test scores more reliable (Bailey 1998:77).

Although people try to avoid subjective scoring as much as possible, sometimes it is necessary to score the responses to a test employing a subjective approach depending on the type of a particular test. Take writing for example, it is almost impossible to score objectively when students' answers are compositions that they write. In circumstances like this, it is very important to consider scoring according to what abilities are to be tested. Take listening test as another example, sometimes students are required to write down what they hear during a listening test. Spelling mistakes may appear in student' answers which are related to their writing abilities. In

such circumstance, if the purpose of the test is to access students' listening abilities, scoring should be focused on whether they can understand what they hear. As a result, answers with spelling mistakes should be considered as partially right.

## ***2.2 The Concept of Categorization***

Living in the world, we are surrounded by an infinite variety of objects with different substances, shapes and colours. However, we still succeed in translating this variety into manageable word meanings even though more often than not there are no clear-cut distinctions available. It is a problem of *categorization*, which is also referred to as the mental process of classification. It is one of the basic features of human language. Its products are *cognitive categories*, for example, the colour categories RED, YELLOW, GREEN and BLUE, etc. ("concept is another widely used term) (Ungerer & Schmid 1996:2).

The term *categorization* in this paper particularly refers to linguistic categorization, whereby people necessarily categorize the world around them when use language.

As has been mentioned before, we often find ourselves surrounded by numerous different phenomena. Among them, there are some which we have no difficulty in identifying and classifying. We usually give appropriate class names to them with ease. Normally, they are eye-catching organisms and objects: people, animals, plants and all kinds of everyday artefacts such as books, chairs, cars and houses. However, we often find ourselves in a dilemma when we try to identify, classify and name other types of entities. Parts of organisms serve as a good example, for instance, knees, ankles and feet of human beings and animals or the trunk, branches and twigs of a tree. It is quite easy for us to say that one's kneecap belongs to one's knee and that the trunk of a tree includes the part which grows out of the ground. Yet no one can say for sure at which point does one's knee end and the thigh starts. We meet similar problems when it comes to landscape names and weather phenomena. Hardly anyone can tell at which particular place a valley is no longer a valley but a slope or a mountain and the point where drizzle turns into rain, rain into snow, and where mist or fog begin or end (Ungerer & Schmid 1996:1-2).

We find that the two types of entities mentioned above differ from each other in respect of their boundaries. Books, tables, cars and houses are clearly delimited objects. On the contrary, the boundaries of entities like knee, trunk, valley and mist are far from clear. They are vague. The vagueness that has made philosophers and linguists interested in the relationship between word meanings and extra-linguistic reality, which has yielded to a large amount of theories on vagueness. However, despite their vagueness we have the feeling that these boundaries do exist in reality. It is clear that a kneecap cannot be included in the thigh, and mountain top will never be part of a valley. In this case, classification seems like to be forced upon us by the boundaries provided by reality (Ungerer & Schmid 1996:2).

Nevertheless, there are other cases where clear boundaries in world reality do not exist. Take physical properties such as length, width, height, temperature and colours for example, all of them have continuous scales extending between two extremes. There is no chance that we can draw a line between cold, warm and hot water, let alone distributing the limited colour terms available in English to all kinds of colours that exist in reality. The temperature scale and the colour continuum do not provide us with natural divisions in comparison with the boundaries of books, cars, and even knees or valleys. As a result, the classification of temperature and colours should be conceived of as a mental process, and it is not surprising that physical properties and colours especially, have served as the starting point for the psychological and conceptual view of word meanings which is at the heart of cognitive linguistics (Ungerer & Schmid 1996: 2).

The belief is deeply engrained that categories are definable in terms of what their member have in common. This is not only the dominant expert theory of the nature of categories, it is also part of our everyday knowledge of what a category is. There are many reasons for the persistence of this belief. Taylor (2003) has already mentioned the role of formal education in imposing expert definitions in his book. Labov's (1973) experiment showed that cups might well merge into bowls in the real world of objects, yet the lexical cups and bowl do not merge into each other. One uses the word *cup* to refer to a particular object, or one does not. Likewise, the pastness of an event from the present (a case involved in the choice of the past tense in English) is a continuum, yet an English speaker must make a decision between the past tense and a non-past tense. One cannot convey degrees of pastness by identifying the pastness of past tense. As a result, we do

not think about the pastness of something that happened in the past, because when we use language, it is just a choice of past tense or present tense. In other words, it seems that language is affecting our way of understanding the world. The very fact that the word *game* is used to refer to a range of different activities easily creates in us the belief that the activities must have something in common, otherwise we would not call all of them the same.

However, it is not true that language forces us to undertake an all-or-nothing categorization. Language has its own resources for expressing degree of category membership. In Kempton's (1981) study of the categorization of footwear, he noted that it was a necessity to design sophisticated experiments in order to elicit prototype effects. The way people spoke about the objects could serve as evidence. Subconsciously, people regarded some shoes as "typical" (or prototypical) ones. Some boots were not as "booty" as others (boots were considered as marginal members of the category). One particular shoe could stand out as "the most typical". His study shows that people are aware of the fact that there are prototypical and less typical members in a certain category.

Lakoff (1972) has used the term hedges for words and expressions of a language which enable a speaker to express degree of category membership. He lists more than sixty English hedges in his paper and the list is not exhaustive. Hedges include sentence adjuncts like *loosely speaking* and *strictly speaking*, conjunctions like *in that*, modifiers like *so-called*, and even graphological devices like inverted commas, as well as certain intonation patterns. Semantically, hedges can be categorized as linguistic expressions that speakers can use to comment on the language they are using. Just like the word chair is "about" chairs, so hedges are "about" language (Kay 1983).

### ***2.3 Previous Studies on Categorization***

The development of categorization studies has gone through two major trends, which are the classical approach and the prototype approach. This section is divided into two sub-sections dealing with the two approaches separately. Moreover, this section relies very much on Taylor (2003) since he has done a large amount of work and is an authority in the field of linguistic categorization. Many secondary sources also refer to Taylor when it comes to categorization.

### 2.3.1 The Classical Approach of Categorization

The classical view represents the most traditional ideas concerning categorization. It can be traced back to Greek antiquity. Aristotle (1963:31) states that some categories can be clearly defined, to cite his own words, “it is possible to find a common boundary at which its parts join together”. Aristotle’s idea is that things in the world (categories) are defined by essential features. The essential features link the members of the categories together. Categories can also have accidental or peripheral features other than the essential features, but they do not play an significant role in defining a category (Kövecses 2006:20).

Aristotle uses one example to explain the difference: the essence of man (human being in this sense). He states that the essence of man is “two footed animal”. The fact that a man might be white or cultured is accidental. These characteristics maybe true for an individual, but they have nothing to do with determining if an entity is a man. For Aristotle, if we want to say that an entity ‘is a man’, it must be ‘two-footed animal’ (Taylor 2003: 20-21). It is the essence that matters and determines whether an entity belongs to a certain category. A man can be white or black, tall or short, but they are not essential characteristics and they do not affect if an entity belongs to the category of MAN.

This can also be put into modern terminology: saying that X is a Y in fact is to assign entity X to category Y, which means that X exhibits the ‘essence’ of category Y. With respect to the above example of MAN, Aristotle suggested two features which define the essence of the category (in other words, two features defining the meaning of the word *man*), namely [TWO-FOOTED] and [ANIMAL]. Both of the two features are necessary for becoming a member of the category. If either of them is missing in an entity, the entity does not belong to the category. Moreover, the two features are sufficient jointly. Any entity exhibits both of the two features qualifies as a member of the category (Taylor 2003:21). As a result, the basic assumption of the classical theory is as follows:

1. Categories are defined in terms of a conjunction of necessary and sufficient features.

2. Features are binary.
3. Categories have clear boundaries.
4. All members of a category have equal status (Taylor 2003:21).

It may be a little difficult to understand the second assumption, which means that there are only two sides of the matter. An entity either possesses the feature or it does not. If it does, then it belongs to the category. If it does not, then it is not a member of the category. There is no fuzzy area in between.

If we adopt the classical theory and accept the above four assumptions, it means that we assume all the members in a category have the same essential features. If they do not, they are not qualified belonging to the category. That is to say, all the members in a category are “good” examples of that category. We can expect clear boundaries between categories, because the essential features will tell us exactly where a category begins and where a category ends (Kövecses 2006:21).

The role that the Aristotle model of categorization has played in mainstream twentieth-century linguistics can scarcely be overlooked. It is ultimately assumptions (1) – (4) that the highly sophisticated formalism associated with much post-war work in phonology, syntax, and semantics rests on. What is more, certain influential schools within modern linguistics have enriched the Aristotle model of categories by making some further assumptions concerning features which define the categories.

Classical categorization has played a venerable role in the history of the west. Classical categories match our intuitions about ‘essence’; they are able to give explanations about the way in which word meanings can be combined into more complex expressions. However, if we examine the matter more closely, we may find that the consequences of the classical theory can hardly hold up. It is unable to explain some of the essential problems concerning categorization. People need a new theory to account for categorization.

### 2.3.2 Transition from the Classical Approach to the Prototype Approach

Ludwig Wittgenstein (1978) has addressed many of the inadequacies of the classical theory of categorization in a highly significant passage in the *Philosophical Investigations*. He raises the question of how to define the German word *Spiel* “game”. There are numerous members in the category of games, for instance, board-games, card-games, ball-games, Olympic games, and so on, but it is noticeable that they do not share a set of common properties on whose basis games can be clearly distinguished from non-games. Thus, the category of games does not fit in with the explanations of the classical theory. The structure of the category is not a set of shared criterial features, rather, it is structured by a criss-crossing network of similarities (Taylor 2003:42). Wittgenstein posed a new term of family resemblance to explain the structure of GAME.

And the result of this examination is: we see a complicated network of similarities overlapping and criss-crossing: sometimes overall similarities, sometimes similarities of detail.

I can think of no better expression to characterize these similarities than ‘family resemblances’; for the various resemblances between members of a family: build, features, colour of eyes, gait, temperament, etc. etc. overlap and criss-cross in the same way. – And I shall say: ‘games’ form a family.... (Wittgenstein 1978:31-33)

He further pointed out that the category has to be learnt on the basis of exemplars:

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)

It is worth noting that Wittgenstein says nothing about the possibility that some kinds of games might be better examples of the category than others, or that some other kinds might be quite marginal. However, it is the topic of many subsequent researches (Taylor 2003:43).

Labov (1973) has carried out a study of linguistic categorization of household receptacles like cups, mugs, bowls, and vases. His study shows that there is no clear dividing line between CUP and BOWL; rather, it seems that one category gradually merges into another, which is also referred to as category-chaining phenomenon. This phenomenon is contrary to the classical theory. The experiment shows that no one single attribute, or set of attributes, is essential for distinguishing the one category from the other. The same receptacle may be categorized differently according to whether it contains coffee or mashed potatoes. The presence of a handle can raise the possibility that an entity will be categorized as a cup. So the question arises that what makes a cup a cup,

and not a bowl or vase. It is difficult to give a definite answer. Nevertheless, even though the boundaries are to some extent fuzzy, there are certain receptacles that are unanimously and uncontroversially described as cups. Put differently, there are better exemplars of the categories of CUP, BOWL and VASE. The house hold receptacles appear to be categorized around good, clear exemplars. This is where the concept of **prototypes** comes into sight. They serve as reference points when people have to categorize no-so-clear instances (Taylor 2003:43-45). Lakoff (1986:30) uses a similar example of household electric appliances to explain the phenomenon, which again proves the classical account of categorization to be inadequate.

Rosch (1973, 1975) also carried out research in the same field. By asking subjects to judge to what extent certain kinds of entities could be regarded as good examples of a category, he studied the structure of natural categories. An investigation on categories of FURNITURE, FRUIT, VEHICLE, WEAPON, VEGETABLE, TOOL, BIRD, SPORT, TOY, and CLOTHING was carried out in 1975. 200 American college students were presented with sixty household items and asked to judge to what extent each of them belong to the category of FURNITURE by giving scores ranging from 1 point to 7 point (Taylor 2003:45-47).

Posner (1986:55) refers to Rosch's works as the most important step which gives prominence to the idea of a prototype as a basis for categorization. The results showed that the degree of membership do exist in a category. Instead of being meaningless, which is according to the classical theory, it is in fact a psychologically very real notion. A second important aspect of Rosch's results is that each of the ten categories investigated shows similar kinds prototype effects, which goes against the original expectations. It was believed that there was a slight difference of prototype effects between **natural kind categories** and **nominal kind categories**. Natural kind categories like *bird* were expected to have clear boundaries and not to display degrees of category membership because it was thought to correspond to some real phenomenon in the world. Its inner constitution determines the range of things in the category. On the contrary, the nominal kind terms were also presumed to have clear boundaries and either-or membership if analytic statements specifying attributes are given. Take the examples of *toy* and *vehicle*, necessary attributes (if not sufficient) can be given. Thus, toy is something that children play with,

a vehicle is a means of locomotion. However, neither of these expectations turned to be true (Taylor 2003:47).

Apart from establishing degree of category membership as a psychologically valid notion, Rosch (1975) also showed degree of category membership to be a relevant factor in a number of experimental paradigms. For example, it takes less time for people to categorize robin as a bird than to categorize a duck as a bird (Rosch 1975). The effect is more apparent with child subjects than with adults, the possible reason is that children have not fully assimilated the more marginal instances to the categories. Degree of membership also has something to do with the effect of priming as well. The subjects must indicate whether the two words shown on the screen are the same or not as quickly as possible. The presentation of a superordinate category<sup>1</sup> name precedes the presentation of the two words. It turns out that if the test words are good examples of the category, the priming with the category name is faster. If the words are poor examples of the category, then the response time of the subjects is slower. Rosch (1975) suggests that the names of more prototypical members of the category are activated by the category name while the names of more marginal members are not (Taylor 2003: 47-48). That is to say, the category name can help people recognize the prototypical members of that category more quickly but can not have the same effects on the marginal members.

Rosch's study (1973) also shows a particularly striking correlation between degree of category membership and the frequency and order with which category members are named. People tend to mention the more prototypical members first when asked to name exemplars of a category. This is also testified by the data collected by Batting and Montague (1969) for fifty-six categories. When Batting and Montague's subjects were asked to list members of the categories FURNITURE, WEAPON, BIRD, and SPORT, they name *chair, gun, robin and football* in the first place more frequently than other members. Rosch's subjects assigned the highest degree of membership to the precisely same members (Taylor 2003:48).

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<sup>1</sup> There are superordinate-level categories and basic-level categories in linguistic categorization. A superordinate-level category include basic-level categories and is more general than a basic-level category. The concept of basic-level categories will be dealt with in detail in section 2.4.

Rosch's questionnaire technique has been applied many times to study the prototype effects. Subjects are asked to indicate the extent to which exemplars belong in a category with a range of category names. It is of special significance about the fact that prototype effects are not restricted to categories denoted by nouns. It is reported by Coleman and Kay (1981) that prototype effects exist in the extent to which statements contained in mini-narratives count as instances of telling a lie. Pulman (1983) found that graded membership also exist in the categories denoted by verbs such as *look*, *kill*, *speak*, and *walk*. Even a more abstract category, which is denoted by the adjective *tall*, was investigated by Dirven and Taylor (1988), and again it turned out to have the same results.

These studies above show that when people categorize common objects, they do not expect them to be equal members of the category. It seems that they have some idea of the characteristics of an ideal exemplar in mind – in other words, a prototype. Probably by matching something against the features of the prototype, they are able to decide on the extent to which something else is a member of the same category. It does not necessarily need to match exactly, but it has to be sufficiently similar (Aitchison 2003:57).

## ***2.4 Theories of Prototypes and Basic-level Categories***

Theories of prototypes are not far away from our daily life. The truth is that we may have been practising many aspects of the theories but we have not realized it. To explain how theories of prototypes work, we can start with the following quote from a fairy tale.

“What kind of bird are you, if you cannot fly”, said the little bird to the duck.  
“what kind of bird are you, if you cannot swim”, said the duck and dived.  
(Prokofier, Peter und der Wolf)<sup>2</sup>

The quote above somehow represents the essence of the prototypical conception of the structures of categories. People create categories so that they can assign the same name (or label) to things that are not exactly the same but similar. In the example, although the duck knows that the little bird can not swim and similarly the little bird knows that the duck can not fly, they still call each other ‘bird’. This goes with what has been mentioned in section 2.2 that features do not allow a

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<sup>2</sup> “Was bist du für ein Vogel, wenn du nicht fliegen kannst”, sagte der kleine Vogel zur Ente. “Was bist du für ein Vogel, wenn du nicht schwimmen kannst”, sagt die Ente und tauchte unter.

clear distinction of categories. In other words, componential analysis, which derives from the classical theory of categorization, is not ideally applicable for categorization. The boundaries of categories are fuzzy rather than clear.

The experiments conducted by both Labov and Rosch mentioned above, show that prototype theory involves a psycholinguistic notion that aids human categorization, as Rosch herself states that human categorisation “should not be considered the arbitrary product of historical principles of categorisation” (1978:27). This means that human cognition plays a primary role for the categorisation process. People assign an object to a category through comparison with its prototype object rather than a set of criterial features. When it comes to second language learning, one’s mother tongue may also have influence on learner’s linguistic categorization since linguistic categorizing varies across languages.<sup>3</sup> However, studies show that there is a great similarity among people in categorizing a wide range of basic concepts. It is still worth studying linguistic categorization and it can have some implications on second language teaching and learning.

Giannakopoulou summarizes the five features of prototype theory in her essay ‘*Prototype Theories: An Evaluation*’ as follows:

A prototypical structure underlines every category.

Prototype categories can not be realised by means of a set of features, since the various members may not share the same amount of such features.

Prototype categories may be blurred at the edges.

Category membership can be realised in terms of gradience.

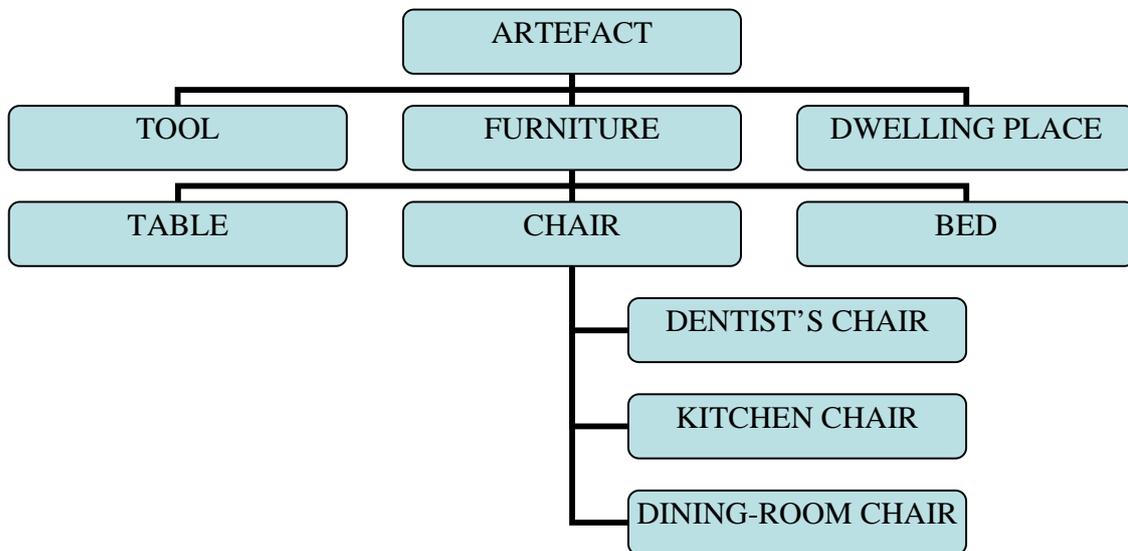
Semantic structures of such categories often cluster and overlap in meaning.

The five features above can also be related to two dimensions, as Taylor (2003:48) states “Prototypicality is bound up with what we might call the **two axes of categorization**”. People may categorize a given entity in many alternative ways. *Chair*, *piece of furniture*, *artefact*, and *entity* can all be the names of the same thing. The four names represent four levels of categorization, each more inclusive than the previous one, as shown in Image 1 (Taylor 2003:48):

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<sup>3</sup> Since it is not the focus of this essay, it will not be discussed in detail.

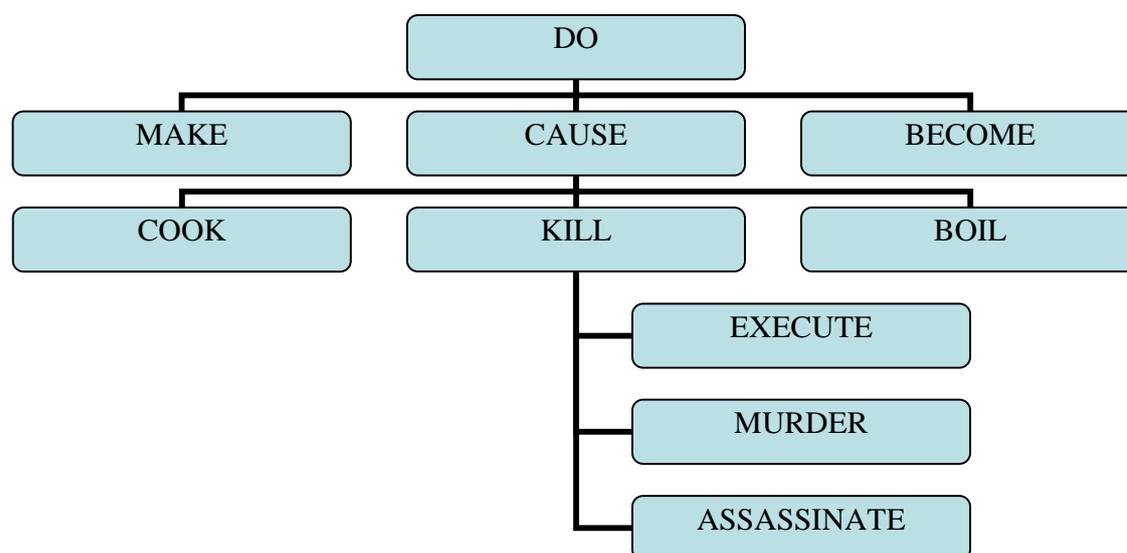
**Image 1: The Two Axes of Categorization (nominal categories)**



We can see from the figure that the category chair is included in the supordinate category furniture, while in turn is included in the even higher category artefact. On the other hand, kitchen chair is a subordinate member of the category chair. The contrasting categories included in the next highest level are represented by the horizontal axis. In other words, tool, furniture, and dwelling place are all examples of artefact; table, chair, bed are instances of chair (Taylor 2003: 49).

Moreover, categorization is not merely restricted to the criteria of objects and organisms. People tend to categorize actions, events, properties, states and locations, too. Image 2 serves as an example (Taylor 2003:50).

**Image 2: The Two Axes of Categorization (verbal Categories)**

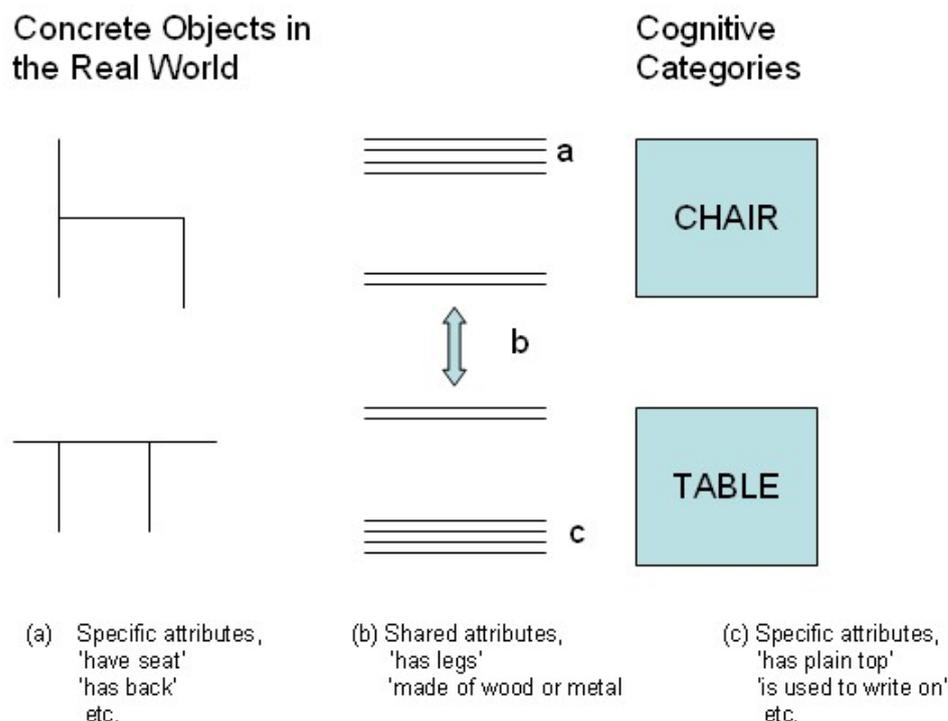


By taking a second look at the two figures we may find that some levels of categories are used more often than others in daily life. For instance, in people's daily life, they would ask someone to sit beside the table or sit in the chair rather the piece of furniture. As a result, it is reasonable to assume that there is a generic level (or basic level, as it is called in psychology) in categorization. This basic level of objects, such as chairs, beds or tables, attract a privileged status. Kleiber (1993:59) explains the reason as that "information-rich bundles of co-occurring perceptual and functional attributes" are to be found at the generic level.

We perceive the most obvious differences between the organisms and objects of the world at the generic or basic level and this level also contains the richest information, so it is also called the most inclusive level. It is believed that basic level categories achieve an ideal balance between internal similarity and external distinctiveness. Another notion of attributes has to be reintroduced to make this more understandable. The largest bundles of naturally correlated attributes are available for categorization on the basic level (Ungerer & Schmid 1996:66-67). Take the basic level categories chair and table for example, in Image 3, the attributes available are represented by lines.

**Image 3: Schematic Representation of Attributes for the Basic Level Categories CHAIR and**

**TABLE**



It can be seen from the figure that each of the two cognitive categories have a large bundle of attributes that apply respectively to most chairs or tables. However, only some of the attributes are shared by both of the two categories such as 'has legs' and 'made of wood', while most of them are not. This reflects the ease with which we distinguish between chairs and tables (Ungerer & Schmid 1996:67).

That is to say, people can obtain the largest amount of information about an item with the least cognitive effort at the basic level. Rosch (1978) defines it as **cognitive economy** principle in '*Principles of Categorization*'. It is common sense that one wishes to gain a great deal of information about the environment from one's categories while conserving finite resources as much as possible. To categorise an entity means to consider it not only equivalent to other entities in the same category but also different from entities not in that category. As a result, it would be one's advantage not to differentiate on entities from others when that differentiation is irrelevant to the purpose of categorization (Rosch 1978).

## ***2.5 The Importance of Categorization***

We constantly categorize the world around us in our daily lives. We do it so naturally that more often than not we do not realize the fact that we are categorizing the world subconsciously. However, the fact that we do not realize it does not mean that it is not important. On the contrary, categorization plays an essential role in human cognition.

To quote Lakoff's (1987:139) original words, "categorization is not a matter to be taken lightly". Nothing is more basic than categorization to our thought, perception, action, and speech. We are categorizing every time we see something as a kind of thing, for example, a tree. We are employing categories whenever we reason about kinds of things – chairs, nations, illness, emotions, any kind of things at all. We are using categories whenever we intentionally perform any kind of action, say something as mundane as writing with a pencil, hammering with a hammer, or ironing clothes. We are employing dozens if not hundreds of categories: categories of speech sounds, of words, of phrases and clauses, as well as conceptual categories any time we either produce or understand any utterance of any reasonable length. If we do not have the ability to categorize, we could not function at all, either in the physical world or in our social and intellectual lives (Lakoff 1987:139-140). We can even go forward to say that we are unable to survive in the world if we are without categorizing abilities.

Most categorization is automatic and unconscious, but it does not take long before people realize how important it is. In a remarkably short time, categorization has moved from the background to centre stage and it has become a major field of study. More and more people come to realize the value of categorization. Thus, it is reasonable to believe that the study of categorization, especially linguistic categorization, can also have some implications in the field of pedagogy.

## **3. Analysis and Discussion**

The primary focuses of this chapter is the analysis and discussion of the data collected from the test. Tables of efficiency and frequency are used to present the data. The results will be dealt with on the overall level first, which allows us to have a general view of the difference. After

that analysis and discussion will be carried through presented results. Comparisons will be made between categorized and uncategorized groups, as well as different academic levels within each group. In addition to those factors, the discussion of the scoring methods will also be carried out before presenting the data, since it has everything to do with the validity of the results collected from the research study.

### ***3.1 Efficiency in the Categorized Group and the Uncategorized Group***

Before we go into the analysis of the data, it is worth pointing out that the results presented in section 3.1 and section 3.2 are mainly from the first part of the test and are arrived at through objective scoring. It has been mentioned in the section of method that there are exact keys for the first of the test. A word is only considered right when it matches exactly the one appeared on the screen. This method of objective scoring makes and test results reliable and in turn makes the analysis and discussion based on them valid. Some may argue that according to the theories of scoring in section 2.1, since the purpose of the first part of the test is to see whether the students has memorized the words during the test, spelling mistakes should be overlooked during the scoring process. However, this is not the case in this research study. The 20 words were chosen with caution before the test. They are from the book in the lower level which the subjects have already passed, so they have already known these words in their previous study. Additionally, the definition of memorizing a word should certainly includes the spelling of it. As a result, an objective scoring approach is applied in the scoring of the first part of the test.

The efficiency report is used to show the different results of the test from the categorized group and the uncategorized group, through which the analysis was conducted on the overall level. The difference shows in minimum, maximum, and average words that are memorized by students, the result is as follows:

**Table 1: Efficiency table of the categorized group and the uncategorized group**

	N	Minimum	Maximum	Average
Categorized	60	3	20	17.22
Uncategorized	60	2	19	12.95
Total	120			

**N = Number of students**

**Categorized = Categorized group**  
**Uncategorized = Uncategorized group**

From the table we can see that the minimum of English words memorized from the two groups are not significantly different. The minimum of the categorized group is 3 while the minimum of the uncategorized group is 2, which is quite unexpected. This may not be caused by the students' reception abilities but rather by factors that are not related to their intelligence, such as their unwillingness to take the test. The maximum data of the two groups is not significantly different between the two groups, either. However, the highest data of 20 is only achieved in the categorized group, which means that a full reception of the words only occurs in the students of the categorized group. Here we can see the fact that categorizing the 20 English words helps the students in memorizing them. Since memorization is an important step in learning vocabulary, it is reasonable to state that students may benefit from linguistic categorization. The biggest difference is shown in the last item of the average words students memorized in the test. The categorized group got 17.4 words right out of 20 on average, while the uncategorized group on the other hand only achieved the efficiency of 13 out of 20. It serves as another piece of evidence that categorizing the 20 English words helped students in memorizing them during the test.

Above is just an overall analysis of the difference between the two groups. A frequency analysis was also conducted to understand the efficiency of the students' vocabulary reception in detail. The data is shown in Table 2 and 3.

**Table 2: Frequency table from the categorized group**

	Frequency	Percent	Cumulative Percent
Score 3	1	1.7	1.7
7	1	1.7	3.4
8	1	1.7	5.4
10	2	3.3	8.7
11	2	3.3	12
13	2	3.3	15.3
14	4	6.7	22
15	2	3.3	25.3
16	2	3.3	28.6
17	1	1.7	30.3
18	8	13.3	43.6
19	12	20	63.6
20	22	36.7	100.3

Total	60	100.3
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**Frequency = Number of students achieving different scores**

**Percent = Percent of students achieving different scores**

**Cumulative percent = Sum of the previous percent**

**The Cumulative Percent is not exactly 100 in the end because Math. Round was carried out during the calculation.**

**Table 3: Frequency table from the uncategorized group**

	Frequency	Valid Percent	Cumulative Percent
Score 2	1	1.7	1.7
5	1	1.7	3.4
7	1	1.7	5.1
8	2	3.3	8.4
9	2	3.3	11.7
10	5	8.3	20
11	4	6.7	26.7
12	5	8.3	35
13	12	20	55
14	9	15	70
15	8	13.3	83.3
16	3	5	88.3
17	2	3.3	91.6
18	4	6.7	98.3
19	1	1.7	100
Total	60	100	

**Frequency = Number of students achieving different scores**

**Percent = Percent of students achieving different scores**

**Cumulative percent = Sum of the previous percent**

These two tables above allow us to have a clearer look at the difference that the categorizing instructions have made between the groups. In the categorized group, 22 students out of 60, which is 36.7% of the total number of students, memorized all of the 20 words. However, no student achieved that goal in the uncategorized group and there was only one student memorizing 19 words. In addition, the majority of the students (42 students, which is 70% of the total) in the categorized group achieved the efficiency level of 18, 19 and 20 words, while the efficiency levels of 13, 14 and 15 words were dominated by 29 students in the uncategorized group, that is nearly half of all the students. From the data in the two tables and the comparison of the two groups we can see that the categorizing the 20 English words helps most of the students in the categorized group to have better results in memorizing them.

The results shown in the three tables in this section go with each other. Table 1 serves as a piece of evidence on the whole and Table 2 serves as another piece of evidence in detail. It has been mentioned in section 2.1, that categorization is a basic mental process of classification. We all categorize the entities around us everyday and everywhere. It is the way we understand the world around us. In the first part of the test, half of the students, namely the categorized group, were given categorized instruction. This process is similar to what they do mentally when they meet entities in real life. Their minds are more comfortable and can absorb categorized information more quickly. Thus, they did better in the first part of the test compared to another group. It takes more time for people to process uncategorized information and the time given to the students in the first part of the test is very limited, so the students of the uncategorized group were unable to achieve a high score in the test.

### ***3.2 Efficiency on Different Academic Levels***

In the above section, data is analyzed through categorized and uncategorized groups. To discover the relationship between students' categorizing abilities and academic achievements, it is worth presenting the data according to their different proficiency levels. The difference is also shown in minimum, maximum and average words memorized by the students from each proficiency level.

**Table 4: Efficiency on different academic levels from the categorized group and the uncategorized group**

	Minimum Score	Maximum Score	Average Score
Categorized – H	14	20	19.05
Categorized – M	10	20	17.55
Categorized – L	3	20	15.05
Uncategorized – H	8	18	14.40
Uncategorized – M	9	19	13.80
Uncategorized – L	2	14	10.65

**Categorized – H = Students of high proficiency in the categorized group**

**Categorized – M = Students of mid proficiency in the categorized group**

**Categorized – L = Students of low proficiency in the categorized group**

**Uncategorized – H = Students of high proficiency in the uncategorized group**

**Uncategorized – M = Students of mid proficiency in the uncategorized group**

**Uncategorized – L = Students of low proficiency in the uncategorized group**

In the minimum column, it is shown that the students of high and mid proficiency in the categorized group at least got a score of ten, which is half of the total 20 words. On the contrary, the minimum score of students of all three different proficiency levels in the uncategorized group are under ten. However, that is not the biggest difference. The most striking difference appears in the maximum column, where we can see that students from all of the three proficiency groups fulfilled the maximum goal of memorizing the 20 words. It is beyond the original expectation to find that students of low proficiency in the categorized group were able to memorize all the 20 English words because memorization is an essential step in second language learning and low proficiency students were expected to have a weak memorizing ability. However, the data of the low proficiency level students in the categorized group indicates that linguistic categorization facilitates an important step – memorization – in their second language learning process.

If we put it another way, we can say that the categorizing the 20 English words helps narrow the gap between high proficiency students and low proficiency students. Ungerer and Schemid (1996) state that among numerous different phenomena in the world, we find some of them easy to give a proper name to while others are rather hard to put into an appropriate category. People have different feelings about categorizing the same entities. The only difference in the first part of the test between the two groups is the way the 20 words are presented to the subjects and it resulted in a significant difference. In the uncategorized group, only one student achieved the score of 19 as shown in Table 3 and that student is at the level of mid proficiency. This may be due to his or her strong ability in memorization. None of the highly proficient students in the uncategorized group fulfilled the task of memorizing all of the 20 words and they only achieved a maximum of 18 words. Thus, the only variable that differs between the two groups is the categorizing contents and it helps the low proficiency level students in the categorized group to be able to catch up with the high proficiency students. It again proves that linguistic categorization has a big influence on the subjects' memorizing process, which is a significant component of the learning process.

The average column can also give us some significant implications of the effects of categorizing the words in the test. It is noticeable that the students' average score of all the three proficiency levels from the categorized group is higher than the students in the uncategorized group. In addition to that, the average score of the students with low proficiency in the categorized group is

higher than that of the students with high proficiency in the uncategorized group. The results should have been similar if the categorizing instruction had little influence on students' performance. However, rather than being similar, there is a big difference shown in the table. This finding testifies to the big difference that linguistic categorization has made during the research study. It helps the weak students progress so much that they can do better than the originally strong students.

A comparison then has to be made within the categorized group to see the difference between individuals. Given the same categorizing instructions, students with the same proficiency level in the categorized group achieved different scores. It shows that students' reception abilities of categorization vary. Moreover, the average scores of students with different proficiency levels implies that the highly proficient students tend to accept the categorized information and deal with categorization better than the weak students. There could also be another opinion that the reason can be that the more proficient students are more likely to have a better mastery of the items than the weak students. This opinion is of course justified since there is a difference in different students' mastery of words. However, in this particular case, the students are quite familiar with the words from the lower level. They are closely related to their daily life and frequently encountered by students in class, so the effect of students' different mastery degree is rather small compared to that of linguistic categorization.

### ***3.3 Different Categorizing Abilities among Students***

The previous two sections endeavour to find the effects of categorizing instructions on students during the test while this section puts emphasis on discovering students' different categorizing abilities. The analysis is mainly based on the second part of the test. Before the actual analysis, it is worth addressing the scoring method employed here for the second part of the test because it is quite different from the first part of the test and it is closely related to how the data is calculated and presented in the tables in Section 3.3, 3.4 and 3.5. A different approach was used here because of the different purpose and type of test tasks (cf. Bachman & Palmer 1996). Although it is advised by many scholars that we should try our best to avoid subjective scoring, it is sometimes unavoidable due to the test type and what we want to test. The second part of the test

is intended to elicit limited production on the part of the test takers. It is hardly possible to predict what kind of category names will appear on the answer sheets, which makes it impossible to provide a copy of correct answers for this part. As a result, a word was counted as categorized as long as the proper category name was given to it. For example, the word *Shanghai* is counted as categorized if the category name is PLACE, CITY, NOUN and etc.. There may be other category names appearing on the answer sheets. As long as they are reasonable, they are considered right. This scoring method is very reasonable because it goes with the purpose of this particular test task, which is to see if the students have a certain knowledge of categorization and can categorize existing words properly. This particular scoring method thus makes the data collected from the second part of the test reliable and adds value to the analysis and discussion of the test results.

In this section, the data in the table is not shown according to the categorized and uncategorized groups for the reason that the second part of the test is identical and this part is mainly concerned with individual students' variable categorizing abilities.

**Table 5: Table of categorizing abilities from all subjects**

	N	Minimum	Maximum	Average
Number of Categories	120	1	15	9.37

**N = Number of students**

**Minimum = Minimum number of categories addressed by students**

**Maximum = Maximum number of categories addressed by students**

**Average = Average number of categories addressed by students**

The table can partially show the different categorizing abilities of the 120 students taking part in the research study. It should be noticed that there is a big difference among individual subjects in their categorizing abilities. The number of categories that the words were distributed into by the subjects varies, with a minimum of three categories and a maximum of 15 categories. It is noticeable that one student had no idea of categorization and just listed one category in the answer sheet. It is not necessarily true that more categories stand for a stronger categorizing ability. However, it is safe to say that students who distribute the 20 English words into more categories have a stronger sense of linguistic categorization. The last column tells us that students were able to categorize the words into 9.37 categories on average. This section just gives us a general idea that different subjects were able to identify different numbers of categories during

the test. The data collected from the test will be dealt with in detail in the next section and some answer sheets will be analyzed to serve as examples.

### ***3.4 Categorizing Abilities and Academic Achievements***

The above analysis partially testifies to the hypothesis that categorizing abilities vary among the students. This section will focus on the relationship between the students' categorizing abilities and their academic achievements through analyzing the data collected in detail. Table 6 reveals the results of the second part of the test according to the subjects' different proficiency levels.

**Table 6: Table of different categorizing abilities from different proficiency levels**

	N	Minimum	Maximum	Average
High Proficiency	40	4	15	12.48
Mid Proficiency	40	2	14	9.80
Low Proficiency	40	1	15	5.75

**N = Number of Students**

**Minimum = Minimum number of categories**

**Maximum = Maximum number of categories**

**Average = Average number of categories**

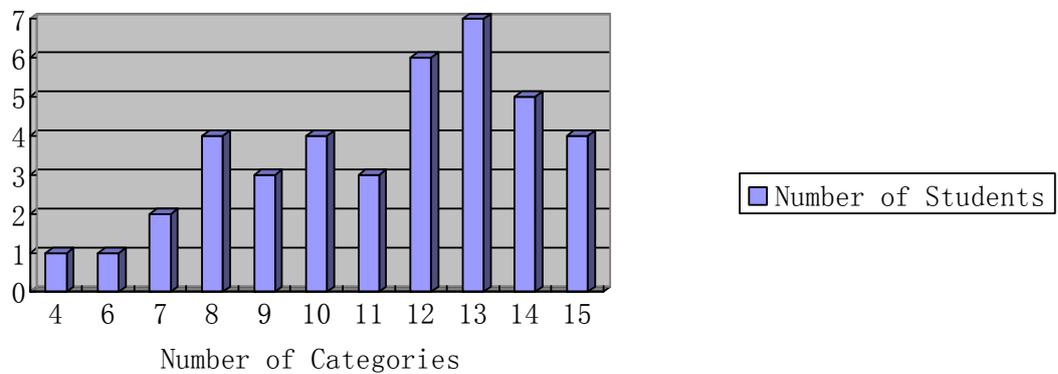
As has been stated before, no examples of categorization of words were given before the second part of the test, so the results can show the students' own ability of linguistic categorization. In the minimum column, we can see that the students of high proficiency level could at least identify four categories during the test, while the minimum data of students at mid proficiency level is two. Furthermore, it has already been pointed out that there is one student from the low proficiency level who was only able to identify one category of the 20 English words. This fact indicates that s/he lacks the knowledge of categories and categorization, which may become an obstacle in his or her further English learning process.

The data of the maximum column is similar for all of the three proficiency levels. There were individuals from all the three proficiency levels who achieved the goal of identifying 14 or 15 categories. However, the average column enables us to find the difference. The average categories that students are able to identify is in descending order. The highly proficient students were able to identify 12.48 categories on average, while the data is 9.80 for the mid proficiency level and 5.75 for the low proficiency level. Moreover, there is a significant difference between

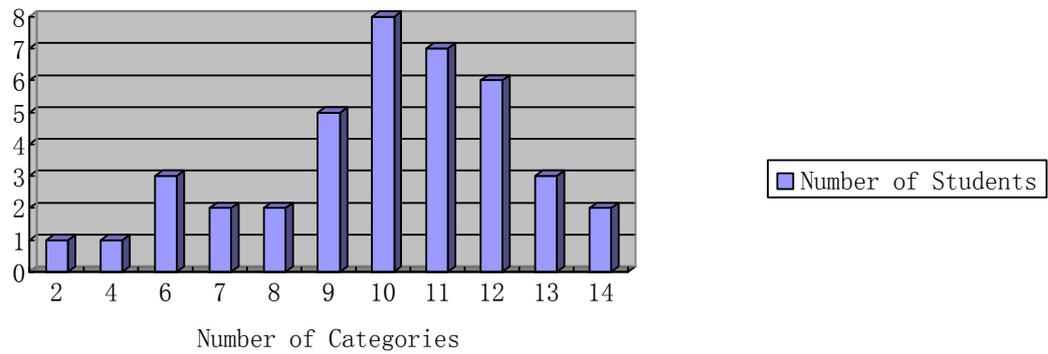
the high proficiency level and the low proficiency level. The number of students on the former level is twice as many as the latter. There is a possibility that the high proficiency students know the words better so that they can categorize them better. However, just like the 20 words in the first section, the words in this section are also frequently encountered by students. They almost have to use them everyday in class. As a result, the difference of mastery degree is minimized and it is reasonable to believe that the distinction is mainly caused by the subjects' different linguistic categorizing abilities. We can say table 6 shows that the categorizing abilities of the high proficiency students are the strongest and that the linguistic categorizing abilities of the low proficiency students are the weakest. There is a positive relationship between the students' linguistic categorizing abilities and academic abilities. It is in line with the hypothesis raised in Section 1 that the high proficiency students possess stronger linguistic categorizing abilities.

Table 6 gives us a general view of the subjects' variable categorizing abilities with each proficiency level. Next, table 7, 8 and 9 show the internal structure of the high, mid and low proficiency group.

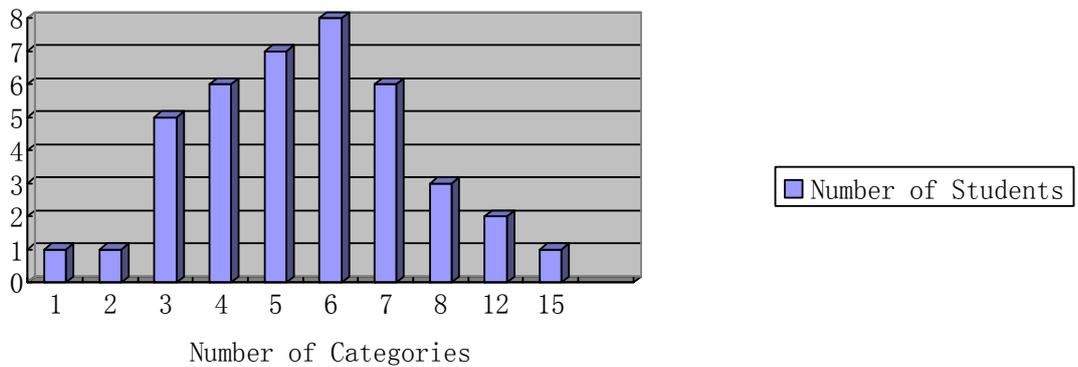
**Table 7: Frequency report of the categorizing abilities from the high proficiency group**



**Table 8: Frequency report of the categorizing abilities from the mid proficiency group**



**Table 9: Frequency report of the categorizing abilities from the low proficiency group**



From the above three tables we can see that even within the same proficiency group, individuals’ linguistic categorizing abilities vary. Table 7 shows that 22 students, which is 55% of the total, in the high proficiency group were able to identify at least 12 categories within the time limit. In the mid proficiency group, the majority of students (26, 65%) dominate the category number of 9, 10, 11 and 12. The contrast is more apparent when compared to the low proficiency group, where the category number of 3, 4, 5, 6 and 7 are dominated by 32 students, which is 80% of the total. It shows that students at the high proficiency level tend to have a stronger sense of categories and linguistic categorization. However, there is an exceptional case in the low proficiency group. One student was able to apply 15 categories to the 20 English words in the test, which indicates that the student’s categorizing ability may be similar to the strongest students in the high proficiency group. Its explanation can be that he or she could do better in English learning but failed due to factors that are not related to intelligence such as unwillingness to study English.

So far in this section, the analysis is mainly focused on how many categories appeared in the second section of the test. It has been stated before that it is not necessarily the truth that the more categories the better. Thus, it is worth examining some subjects' answers to see how they categorized the 20 English words differently in the test.

Three sample answers from three proficiency groups are selected to be analyzed in detail to see how the subjects categorized the words differently. One serves as a good example of linguistic categorization identifying 12 categories, one serves as an intermediate identifying nine categories and the other serves as a weak example identifying five categories. The numbers of categories identified in the three sample answers match the average numbers of categories identified by every proficiency group so that they can be representative. All the sample answers were transcribed into the computer to protect the subjects' anonymity. Moreover, sometimes students used Chinese to describe category names and they were translated into English. The three answers are shown in image 4, 5 and 6.

**Image 4: Answer from the high proficiency group**

Noun: rice, banana, Shanghai, first,  
Pronoun: first  
Adjective: well, high, low, first, a  
Verb: notional verb: play, move, do  
    auxiliary verb: can  
    past participle: been  
    present participle: doing  
    third-person singular form of word: does  
    past tense of verbs: had, came  
Preposition: for, but  
Conjunction: for, but  
Article: the

**Image 5: Answer from the mid proficiency group**

Noun: rice, banana, Shanghai, first,  
Pronoun: first  
Adjective: well, high, low, first, a  
Verb: play, move, had, came, been, do, can, does, doing  
Preposition: for, but  
Conjunction: for, but  
Article: the

Food: rice, banana  
City: Shanghai

**Image 6: Answer from the low proficiency group**

Food: rice, banana  
City: Shanghai  
Adjective: well, high, low,  
Verb: play, move, had, came, been, do, can, does, doing  
Article: the, a  
?: for, but

There is a question mark in image 6 because the student was unable to give the name of the category. The above three images allow us to see the difference among individuals. From image 4 we can see that the student was able to categorize the 20 English words properly within the time limit and all of the words are categorized grammatically. S/he was able to use a consistent standard in linguistic categorization. It is also noticeable that in the category of VERB, s/he was able to identify six sub-categories. Moreover, s/he was aware of the fact that different categories may overlap and one word may belong to different categories. The answer shows that s/he possesses a strong ability in linguistic categorization. When it comes to image 5, it is worth noting that the student categorized the words both semantically and grammatically. The three words *rice*, *banana* and *Shanghai* were categorized both according to their meanings and their parts of speech. However, it is reasonable to believe that the student was aware of the fact that they are two different ways of linguistic categorization because the categories of FOOD and CITY are separated from others (while transcribing, the words are put separately if the students put them separately in their answer sheets). Another difference is that there are no sub-categories under the category of VERB. It is of course valid as well, but it is not as precise as the first one. Compare to the first two answers, there are only five category names in image 6 and the student was unable to give a proper category name of the two words *but* and *for*, although from fact that

s/he puts them together we can assume the student's awareness of them belonging to the same linguistic category. In addition, the 20 English words are categorized both semantically and grammatically just like in Image 5. However, the category of noun does not appear in the answer and the three words *rice*, *banana* and *Shanghai* are only categorized according to their meanings. This fact indicates that the students may be not aware of the difference of the two different ways of linguistic categorization, which in turn implies that s/he has a weak ability of linguistic categorization. If we count the number of words in image 6, we find that the word *first* is missing. This may be due to prototype effects which will be discussed in section 3.5.

The three images above are a detailed presentation of how the individual subjects categorized the same 20 words differently during the test. Image 4 and 5 show the subjects' ability of linguistic categorization. The students were able to categorize the 20 words properly according to a consistent standard. However, the student who produced Image 6 was unable to categorize all the 20 English words properly and mix two different ways of linguistic categorization, which indicates that s/he possesses a rather weak ability of linguistic categorization.

### ***3.5 Prototype Effects in Categorizing***

An analysis of the second part of the test also reveals the fact that although the students' categorizing abilities vary, they find some of the words easier to classify into a category than others. Table 10 shows the result of the second part of the test with focus on the subjects' different categorizing abilities concerning different words.

**Table 10: Report of categorizing abilities with different words**

Word	Number of Students	Percentage
Play	118	98.33
For	80	66.67
But	79	65.83
Move	116	96.67
Rice	120	100.00
Banana	120	100.00
Shanghai	109	93.2
Well	115	95.83
High	117	97.50
Low	117	97.50
A	108	90.00

The	107	89.17
Had	95	79.17
Came	95	79.17
Been	89	74.17
First	85	70.83
Do	119	99.17
Can	90	75.00
Does	92	76.67
Doing	93	77.50

It is noticeable that all the students were able to categorize *rice* and *banana* during the test, although into different categories. Some students tended to categorize words on the basic level (such as FRUIT) while other tended to categorize them on the general level (such as FOOD). When we categorize entities, we perceive the most obvious differences between them at the generic or basic level, because it is the efficient and economical way of classifying things (cf. Ungerer & Schmid 1996). During the test, most students classify the word *banana* as either FRUIT or FOOD. The subjects in the test also chose the comparatively economical way to categorize words.

It is noticeable that all the students were able to categorize *banana* and *rice* although there are two ways of categorizing them, semantically or grammatically. Most of the students were able to categorize them in both ways, which indicates that *rice* and *banana* are very good examples of their categories. On the contrary, fewer students were able to identify the category of *Shanghai*, which can also be categorized both semantically or grammatically. This fact goes against the classical theory of categorization that words are equal members of their categories and has the same status in the categories they belong to. Rather, some members are better examples (or prototypes) of the category while others are not so prototypical (or marginal) members (cf. Taylor 2003). Another reason may be that *Shanghai* is a proper noun, which points to a specific individual (a city in this case). Normally proper nouns are not categorized like common nouns. If this is the case, it also shows that people consider common nouns like *banana* and *rice* as more prototypical members of the category of noun than proper nouns like *Shanghai*, which confirms the prototype effects.

Table 10 shows that there is also a degree of membership with other types of words other nouns (cf. Taylor 2003). Most of the students were able to categorize play, move and do as verbs, 98.33%, 96.67% and 99.17% respectively. However, fewer students were able to categorize the

inflectional forms of verbs such as *had* (79.17%), *came* (79.17%), *been* (74.17%), *does* (76.67%) and *doing* (77.50%). It indicates that the original verbs are considered as better examples of the category of verb, while the inflectional verbs are considered as marginal examples of that category. Students also found it hard to categorize the auxiliary verbs like *can*, partly because auxiliary are not considered as prototypical verbs. Another reason may be due to the fact that the nature of auxiliary verbs is more close to that of function words. Harley (2006:186) states that functions words are more acquired than learned. Since English is the students' second language, maybe it is one of the reasons why they found auxiliary words harder to categorize.<sup>4</sup>

When it comes to adjectives and adverbs, it appears that more or less the same number of students were able to categorize the three words *high*, *low* and *well*. Whereas, when we take a closer look at the subjects' answer sheets, there are basically two ways of categorizing the same word *well*, as an adjective or an adverb, and no one categorized it as a noun. However, more students categorized it as an adverb than as an adjective. This means that the word *well* serves as a prototype in the category of adverbs, but as a not so good example in the category of adjectives. The fact that no one categorized it as a noun may be due to the fact that we rarely see or talk about *well* in modern society and the other two usages of the word *well* are so frequently employed.

The phenomenon is true with the other words as well. It indicates that not only do nouns which are used to name entities have prototypes, verbs describing movements, adjectives describing states, and other types of words also have prototype effects. Just like Image 2 borrowed from Taylor (2003:50), people tend to categorize actions, events, properties, states and locations, too. People consider some of them as central examples while others are considered as marginal examples.

From the above analysis and discussion of the data collected from the research, we can see that the three hypotheses posed at the very beginning of the essay are confirmed and testified. The categorizing abilities of the students taking part in the research study do vary and it tends to have

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<sup>4</sup> Since the difference of content words and function words is not the focus of this essay, the question is not discussed in detail here.

a positive relationship with their academic achievements. The students at the high proficiency level tend to have a stronger categorizing ability than the low proficiency students. In addition to that, categorizing the 20 English words help the students in memorizing them. Since memorization is an important step in learning vocabulary, it is reasonable to believe that linguistic categorization can facilitate students' second language learning process.

## **4. Implications for Language Learning and Teaching**

The above analysis and discussion give us some implications for the categorization approach to vocabulary teaching. Chapter 4 will mainly focus on this point, especially how to develop students' categorization abilities in a foreign language classroom and how to develop the students' learning strategies through a categorization approach.

### ***4.1 Developing Categorization Abilities***

From the analysis in section 3.1, we can see that the performance of students in the categorized group and the uncategorized are quite different due to different instructions. Students did better when the 20 English words were categorized than when they were presented in a random order. This shows that categorization has a great impact on improving the students' memorization efficiency, which in turn facilitate their vocabulary learning. Therefore, developing students' categorization abilities seems to be very important. The focus of this paper is on the students' categorization abilities of a foreign language, which is believed to be less developed than their first language in tasks of categorizing. It is necessary for teachers to bear this precondition in mind and work hard to develop students' categorizing abilities. Although there are different kinds of classes, materials and subjects, some common approaches could be recommended and applied to achieve this end:

1. Teachers present the categorized teaching content and remind students of the concept of categorization in teaching every day.
2. Teachers help the students apply a categorization approach in completing their learning tasks.
3. Teachers can organize some categorization games.

#### 4. Teachers can give specific classes on categorization.

A good teacher should not only teach the contents but also show the students how to learn more efficiently. The learning process of students will be facilitated if they form the intention of categorization, just like the 60 students in the categorized group in the research study. Teachers can serve as a model in class. If teachers categorize the teaching content in class every day, the students will finish the learning tasks efficiently. Moreover, they will gradually be influenced by the way which the teachers categorize the teaching content. The suggestions for how to categorize the teaching content will be discussed in the next section (Section 4.2).

Even when influenced by the teachers, students may still finish their learning tasks in an uncategorized way. From the test result, we can see that some students in the categorized group still achieved low scores in the first part of the test. They still need the teachers' help in dealing with some difficult problems concerning categorization. For instance, when the students have problems understanding the object clause, which means that they do not have a clear construction of the important features of it, teachers are supposed to help the students categorize the important features of this particular category. After linguistic expressions are given such as *I don't know who has won the game*; *he told me why he was so happy yesterday* and *he didn't tell me when we should meet again*, teachers can help students find the common features of the object clause such as (1) defining the object clause; (2) uniting the verb tenses; (3) showing the structures of simple questions and special questions as statements. This process will not only help them in understanding this particular notion of object clause but also be of benefit to them in their future learning by using methods of categorization. One important assumption of the classical approach of categorization is that the members of a particular category have common features and this fact makes the boundaries between categories clear (cf. Taylor 2003). Although this assumption has been proved by many linguists as inadequate and inaccurate, the common features of members in a category can serve as a good starting point in helping students understand the concept of categorization gradually.

Games can also be applied to develop students' categorization abilities as well as arouse their awareness of categorization. Some typical games to develop student' categorization abilities are proposed here:

1. Students work in groups or separately to categorize any given words or sentences. The group or individual with the least time is the winner.
2. Students work in groups or separately to categorize any given objects, the group or individual spending the least time wins.
3. Students work in groups or separately to write down as many words as possible from a given category with in a certain period of time. The group or individual with the most words is the winner.

The analysis in section 3.3 and 3.4 shows that some students particularly lack the knowledge and ability of categorizing and their ability and speed of accepting a new categorizing approach vary, so sometimes their categorization awareness needs to be reinforced through specific class. This could be done through a grammar class or the categorization approach. However, the educators can not just design a class randomly. In order to plan a class that really helps students develop their categorizing abilities, teachers has to base their class construction according to certain theories.

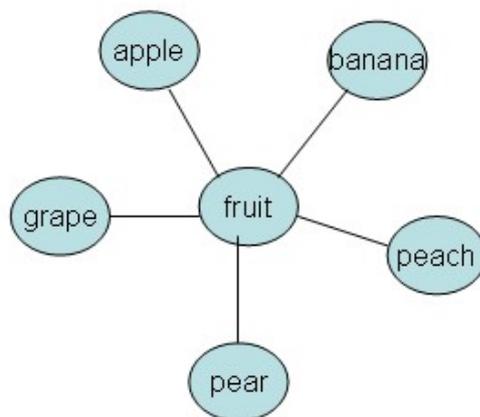
It has been mentioned in section 2.3 that there are two models of how to have access to categorization, namely the classical model and the non-classical model. They give rise to different expectations of classes where students acquisition of categorization takes place. Although the classical approach of categorization has been proved inadequate and its assumptions such as categories have unambiguous and clear-cut boundaries have been proved inaccurate, we can still utilize part of it which can serve as a good starting point. Just as what has been mentioned before in the example of teaching the object clause, defining features in a category can be a good starting point in helping students develop categorizing abilities. Prototype theories can also be integrated into such kind of classes. Some particular examples of object clause can be presented to students first to serve as prototypes of the category. After that, students

can compare the new examples they meet with the prototypes to enlarge their knowledge of categorization.

#### ***4.2 Teaching Categorization in Classroom***

There are all kinds of learning tasks in school language class, such as topic discussion, vocabulary learning, and grammar summarizing, working in groups and so on. Teachers can apply a categorization approach to help students accomplish all of these tasks. However, teachers should bear the principles as concise, precise and relevant in mind while applying the categorization approach. A figure is used here to explain our learning process.

**Figure 3: An Simple Example of mental web**



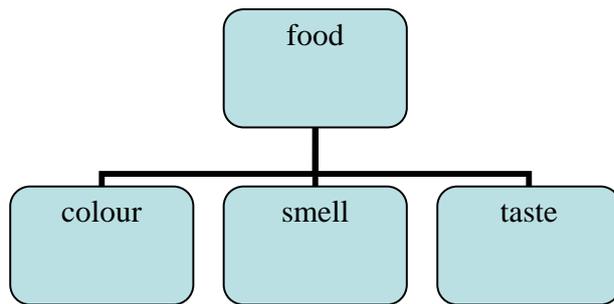
The picture is a simplified representation of mental web according to Aithison's (1996:84) work. It shows our ultimate purpose of learning, which is to construct a mental web in our mind, as Aitchison (1996:84) states in her book *Words in the Mind*. To achieve this end, there are some pre-steps before the mental web is fully constructed. First of all, students simply acquire bits of information from their daily lives. The information is unconnected and acquired incidentally, which has no categorization and make no sense. After that, a number of connections may be made gradually but on the whole it still belongs to an unstructured step and students haven't

realized the significance of the structure construction. Then step by step students are able to appreciate the significance of the relationship between the parts to the whole and start to build the connections consciously. Finally, some of them with strong categorizing abilities are able to proceed to the extended abstract level. They can make connections beyond the given subject area and generalize and transfer the principles and ideas underlying the specific instance. Aitchison (1996:126-136) also addresses this issue in her work, though in a different way. According to her, words are not stored as single items for use in our mind, rather, they are assembled to have internal structure. Students can acquire the knowledge of bits of words everywhere by themselves. However, it is the teachers who can help them to build an internal structure through categorization.

Section 3.1 shows that how teachers give instructions before the test and how the materials are presented have a stake in students' performance. Teachers should consider this fact seriously and try their best to improve their teaching approaches according to these learning steps. The suggestion here is that teachers need to begin with step three, introducing the structure of the learning objectives on the whole first. This must be done in a concise way so that it does not arouse any confusion and students understand the objectives with ease. This step will give them a general structure of what to be learnt and build their confidence in the next step. Secondly, help students understand the connections between objectives, which serve the function as prototypes. Then with the help of their existing categorization abilities, they can take an active role in the learning process. They can start to create connections by themselves when they acquire new information. In this way, students develop self-learning abilities. To achieve the ultimate objective in Figure 4.1, students are expected to show their creativity which differ from person to person.

The teaching procedures above can be applied in various tasks such as topic discussion, vocabulary learning and grammar summarizing. Take the discussion of food as an example, we can categorize the learning tasks in this way:

**Figure 4.2 An example of categorizing learning tasks in class**



The figure shows the learning objectives of the discussion and is followed by three words denoting different categories. If the teacher puts this figure on the board, students can easily understand the learning objectives and start to construct categorization of knowledge. It also allows students to have some space developing their own cognition skills since teachers can not supervise every group's discussion from the very beginning to the end. Figure 4.2 just serves as an example, categorization can help in classroom teaching activities in various forms due to different circumstances.

However, teachers should be very careful when drawing categories. As has been pointed out in the theoretical background (Section 2.4), there are basic levels and superordinate levels of categories. People are inclined to categorize things at the basic level because it is the economical way. In Tversky's (1986:66) words, it is "most accessible to memory". Teachers should take this element into account while designing classes. At what levels the words are categorized is quite important to whether the teaching approach can really help students. If teachers lack the knowledge and awareness of categorization and basic level categories, they may even pose difficulties in students' learning process.

## 5. Conclusion

In this chapter, conclusions will be drawn from both the research findings and the discussion carried out above. The three hypotheses proposed at the very beginning of the essay is testified through the study, and conclusions can be drawn as follows:

1. Students' categorizing abilities vary substantially.

2. Categorizing learning content is an effective way to improve students academic performance.
3. Categorizing learning content can help students of all levels.
4. Students with higher academic achievements have stronger abilities of categorization.
5. Categorizing learning content help narrow the gap between high proficiency students and low proficiency students.

Categorization has been proved to play an important role in second language learning through the research study so that teachers should employ this aspect in classroom teaching. However, much further work still needs to be done in this field. We need to determine what combination of categorization is suitable for particular levels and particular students. How students could apply categorizing skills in their own learning is also worth investigating. Despite the fact that there are still many uncertainties in the field of categorization, categorizing has been proved to be influential in the process of students' second language learning and more emphasis should be put on the subject matter.

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## Appendices

### Appendix 1

#### Test A for the Categorized Group

##### Part One

**Fruit:** orange lemon apple peach pear

**Subject:** English Chinese math PE music

**Furniture:** sofa bed mirror table cabinet

**Transportation:** car jeep taxi ship plane

##### Part Two

play for but move rice

banana Shanghai well high low

a the had came been

first do can does doing

## Appendix 2

### Test B for the Uncategorized Group

#### Part One

English car cabinet peach orange

Sofa jeep PE lemon plane

Pear taxi ship apple music

Chinese bed music mirror table

#### Part Two

play for but move rice

banana Shanghai well high low

a the had came been

first do can does doing

Appendix 3

**Answer Sheet**

**Name:** \_\_\_\_\_

**1. Please write down the words shown on the screen. (as many as possible)**

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**2. Please categorize the words on the screen. (as many as possible)**

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