DE GRUYTER European Journal for Applied Linguistics

Prototypical associations in the production of words in English as a foreign language by L2 learners

Abstract:	This ongoing study attempts to explore the role semantic prototypes play in response to the production of words of a semantic category by two groups of learners differing in age and language level. Our main objectives point to i) the identification of the number of words produced in English regarding semantic prototypes by the groups of informants; ii) the analysis and comparison of the similarities and the differences of the prototypical associations provided by learners of different ages and different language levels; iii) the evidence of the universality of prototypes in the selected semantic category. The data collection instruments considered for this ongoing study are a background questionnaire and a productive semantic categorization task. Findings yielded that (i) despite some differences, the universality of prototypes is present in the selected semantic category between the two groups differing in age and language level; (ii) the evidence of prototypes is exclusively associated with the basic level of categorization; (iii) children retrieved fewer prototypical and non-prototypical words than adolescents in a lexical availability test. This study aims to evolve the dynamics of prototypical associations in language, and their linguistic, social, and cultural implications in communication when learning a foreign language. Keywords: Prototypical Associations, Productive Vocabulary, Age Factor, Language Level, EFL learners.

Prototypical associations in the production of words in English as a foreign language by L2 learners

Abstract

This ongoing study attempts to explore the role semantic prototypes play in response to the production of words of a semantic category by two groups of learners differing in age and language level. Our main objectives point to i) the identification of the number of words produced in English regarding semantic prototypes by the groups of informants; ii) the analysis and comparison of the similarities and the differences of the prototypical associations provided by learners of different ages and different language levels; iii) the evidence of the universality of prototypes in the selected semantic category. The data collection instruments considered for this ongoing study are a background questionnaire and a productive semantic categorization task. Findings yielded that (i) despite some differences, the universality of prototypes is present in the selected semantic category between the two groups differing in age and language level; (ii) the evidence of prototypes is exclusively associated with the basic level of categorization; (iii) children retrieved fewer prototypical and non-prototypical words than adolescents in a lexical availability test. This study aims to evolve the dynamics of prototypical associations in language, and their linguistic, social, and cultural implications in communication when learning a foreign language.

Keywords: *Prototypical Associations, Productive Vocabulary, Age Factor, Language Level, EFL learners.*

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

1 Introduction

A semantic prototype is seen as the best, central, and most representative exemplar in a category by the human being (Rosch 1975). Research on the words associated in response to semantic categories is essential for understanding how the categorization process works in a language, and precisely how L2 English foreign language (EFL) learners categorize vocabulary (Pavlenko 2009). Although several studies on prototypes regarding L2 vocabulary acquisition have been conducted (Xiaoyan and Georg-Wolf 2010; Duan and Da 2015; Zhang 2017), research on prototypical association tasks, age in second language acquisition (SLA), and vocabulary in EFL contexts are rather scarce. Our study aims at exploring this research gap through the analysis of one semantic category - *hobbies*- via a lexical availability test by considering age as a sociolinguistic factor.

This initial study will briefly review semantic prototypes, age in SLA, and related studies on these matters. Subsequently, we will describe the method along with the preliminary results obtained, and finally, we will unveil our conclusions and their implications for further studies on prototypes and vocabulary production in EFL contexts.

2 Theoretical framework and literature review

2.1 The theory of prototype

The interpretation of the Aristotelian classical theory of categorization changes considerably in Rosch's (1975) prototype conception. This scholar suggests that a prototype is the best, central, and most representative exemplar in a category. For instance, the central case in the category *fruit* is *apple*, whereas the least representative member is *olive*. In our view, this theory implies that the prototype is the exemplary best recognized by the human being in a category. Additionally, categorical members are arranged in order of *goodness*, that is, members are classified into very typical or less typical members (Murphy 2002). From the development of the definition of prototype and its theory, two versions broaden its concept: the *standard* version and the *extended* version (Kleiber 1995). In both versions, the prototype becomes the central case in the category. The *standard* version proposes that the prototype not only is the central member of a category

but also is organized through different levels of categorization (Superordinate, Basic, and Subordinate). In this hierarchy, the basic level is the most salient learned first by children and easily identified (Kleiber 1995). However, as conceptualized in Lakoff's (1987) *extended* version, not all the categorization cases can be prototypical. In other words, the members of a category might be linked without the existence of a common feature among all members. That is, Lakoff's (1997) theory on radial categories as *hobbies* will describe how the prototype is evidenced by means of the family resemblance theory, which emphasizes the idea of membership in a category despite having non- shared features (see Wittgenstein, 1953).

Both standard and extended versions have contributed to understanding the role of prototypes in studies on linguistic and semantic categories.

2.2 The role of age in SLA

Age is recognized to be a crucial factor in language learning. In SLA, specifically, age is defined as an individual factor of learning and acquisition (Singleton 2003; Muñoz 2006). From this assumption, the belief of "the younger the better" in SLA has been studied in two different contexts. The former is related to *acquisition*[1] which implies that the learning of a second language is conducted through informal exchanging communication with native speakers of the target language in natural settings. The latter has to do with *learning*[2], which claims that second language (SL) learners receive formal input in limited amounts of time by a non-native teacher in instructional settings. Moreover, age in SLA is defined as a frequent variable whether in natural or formal contexts (Jiménez et al. 2014). Research on natural settings has been concentrated on the notion of critical period hypothesis (CPH) as suggested by Penfield and Roberts (1959) and brain lateralization as put forward by Lenneberg (1967). The former refers to a period of time when language acquisition takes place naturally and effortlessly. The latter involves that the two sides of the brain develop specialized functions, and then the brain loses its plasticity. That is, the lateralization process is usually completed at puberty making demanding the post-adolescent acquisition of language.

In contrast, in instructional contexts, age research has been focused on the relationship between starting age and language fulfillment. For instance, whereas some researchers

---

[1] Acquisition: "picking up a language through exposure" (Ellis, 1985:5)
[2] Learning: "conscious study of a second language" (Ellis, 1985:5)

claim that older learners outperform younger learners in almost all linguistic aspects (Cenoz 2002; Lightbown 2008; Muñoz 2008), Yamada et al. (1980), on the contrary, assert that the success of young learners' performance over older learners results from the advantage the former have concerning pronunciation and sound imitation. In this regard, there is no certainty about how a critical period affects SL learning since linguistic aspects such as syntax, morphology and phonology are not constrained by a limited period of time (Martohardjono and Flynn 1995).

2.3 Review of literature

As far as studies on age and lexical availability in FL are concerned, this variable has been addressed from a sociolinguistic view rather than from a cognitive approach. Even though most research on lexical availability has been focused on Spanish as L1, L2 studies on this field have proved to reveal significant outcomes regarding the variation in the characteristics of the word responses provided by groups differing in age and language level (Carcedo 1998; Samper Hernández 2002; Jiménez et al. 2014).

Concerning studies on prototypes and vocabulary learning in EFL settings, there have been analysis of adjectives in the prototypicality of word senses (Yuan, 1990; Lukusa, 1996); the frequency of input of words through prototype networks has been explored (Vermeer, 2001); English prepositions and the prototypical sense provided in the acquisition of an L2 (Cho, 2010); the basic- level salience through the recognition of prototype levels of categorisation (Xiaoyan and Georg- Wolf, 2010); vocabulary acquisition and teaching by means of using learning and teaching prototype models (Duan and Da, 2015); vocabulary acquisition seen from the perspectives of culture and psycholinguistic aspects such as lexical availability (Šifrar Kalan, 2016); the role the prototype theory plays in English vocabulary teaching (Zhang, 2017); word associations to recognize either universality of language or divergences or convergences in the field of semantic prototypes through the use of two semantic categories (Author, 2019); prototypical associations and cultural aspects in EFL textbooks (Author, 2021a; Author, 2021b). Nevertheless, studies on prototypes and age in the production of vocabulary through a lexical availability test have not been published. To the best of our knowledge, ours is the first attempt to investigate how prototypical associations are retrieved by two groups of EFL learners differing on age and language level in response to one semantic

category by means of a lexical availability task. For this preliminary study, we considered the following research questions:

1. Are there prototypical word associations retrieved by the two groups of informants in response to the semantic category of *hobbies*? If so, is there any reference to a specific level of categorization?

2. Does the number of word responses provided by the group of adolescents surpass the prototypical word associations retrieved by the group of children?

3. Owing to age and language level differences, do children and adolescents evidence the universality of prototypes in response to the category of *hobbies*? Or, on the contrary, do the word responses differ?

3 Method

3.1 Participants

In this preliminary study, we examine English prototypical word responses to a lexical availability test accomplished by 40 Spanish students, learners of English as a foreign language from La Rioja, a region of the north of Spain. Two different groups of different age and language level participate in this study. The first group is composed of 20 students from 6th primary education aged between (11-13) years old, and the second group consists of 20 students from 2nd baccalaureate aged between (16-17) years old. Although the complete sample is greater, we considered this small sampling for this initial study.

The group of children (6th primary) corresponds to the last year of Spanish elementary education, whereas the group of adolescents (2nd baccalaureate) pertains to the last year of Spanish non-compulsory education. The decision of analyzing these two stages of learning was made because these two groups belong to the end of an educational stage, thus, differences in age and language level are present, and allow us to analyze how these two groups of informants respond to a category by evoking prototypical associations in a lexical availability test.

3.1.1 Data analysis and management

The data presented in this paper were analyzed by applying a lexical availability test recently administered by the group of applied linguistics of the University of La Rioja (GLAUR). This test consists of a questionnaire with different center of interests or prompts traditionally used in L1 Spanish lexical availability studies (e.g., *parts of the body, clothes, hobbies)*. We focused our attention on the category of *hobbies* owing to being one of the topics included in the curriculum of La Rioja (Decree 24/2014; Decree 5/2011) in both educational levels.

The time provided for responding to this lexical availability test was 30 minutes (2 minutes per prompt). The prompts and test format were maintained the same for both groups of learners. All students were encouraged to write down as many words as came to their minds for each center of interest.

Data management and analysis were performed using a Microsoft Excel spreadsheet to edit students' answers. As for the editing of word responses, we adopted the criteria put forward by Jiménez Catalán and Ojeda Alba (2009-2010) to provide accuracy and reliability of data in the process of lemmatization, codification, and editing of the corpus. These criteria included aspects such as (i) correcting spelling mistakes, (ii) counting repeated words only once per prompt, (iii) discarding unintelligible words and Spanish words, (iv) deleting possessive adjectives and articles, (v) counting lexical units as one word and inserting a hyphen in lexical units containing more than one word (e.g., listen-to-music). For this specific and initial ongoing research, we counted the words retrieved for the category of hobbies without using any text analyzers. However, for the successful achievement of our analysis, we will examine a greater sample by using WordSmith Tools since, in previous studies, it has provided innovative insights into learners' lexical availability (Jiménez et al. 2014).

Regarding the prototypes analysis, we have adopted the following methodological decisions. In order to define the type of category, we relied on Lakoff's representation of radial categories (1987). As explained in the theoretical foundations, the category of *hobbies* has been previously defined as radial (Lakoff, 1987 cited in Hernandez Muñoz, 2006). Additionally, so as to define a semantic prototype, we considered the notion of the prototype as the best exemplar in a category (Rosch, 1975). Furthermore, we examined the levels of

categorization since they represent the organization of the words in the mind hierarchically (Rosch et al., 1976).

4. Preliminary results and discussion

Table 1 will display the words retrieved by each group of learners ranked in descending order by the number of students who retrieved each word.

Table 1. *"Hobbies" : Lists of the words retrieved by children and adolescents distributed according to the number of informants who retrieved each word.*

Children	football (14), tennis (10), playing (9), basketball (8), reading (7), sleeping (7), drawing (6), jumping (6), music (6), watch-tv (6), running (5), book (4), friends (4), writing (4), cricket (3), dancing (3), eating (3), happy (3), sad (3), shopping (3), ball (2), buying (2), going-to-school (2), mobile (2), painting (2), skating (2), studying (2) singing (2), angry (1), anime (1), black (1), blue (1), bored (1), brown (1), camping (1), cars (1), cinema (1), cleaning (1), colours (1), comics (1), confuse (1), cooking (1), cycling (1), driving (1), exciting (1), feelings (1), green (1), grey (1), hanging-out (1), headphones (1), hockey (1), house (1), hungry (1), illustrator (1), listen-to-music (1), love (1), (my) brother (1), (my) dad (1), (my) family, (my) friend, (my) grandfather (1), (my) homework (1), (my) mum (1), (my) teacher (1), musical-chair (1), paddle (1), park (1), pencil (1), play-station (1), pink (1), rainy (1), red (1), speaking (1), swimming (1), tablet (1), talk-to-friends (1), training (1), telephone (1), umbrella (1), video-games (1), volleyball (1), walking (1), writer (1).
Adolescents	football (16), basketball (12), tennis (12), watch-tv (11), listen-to-music (11), dancing (10), reading (10), writing (10), friends (9), running (9), singing (9) sport (9), sleeping (8), painting (7), drawing (6), eating (6), films (6), handball (6), swimming (6), walking (6), video-games (6), judo (5), karate (5), play-instruments (4), volleyball(4), badminton (3), climbing (3), cooking (3), go-to-the-gym (3), music (3), playing (3), series (3), studying (3), surfing (3), travelling (3), yoga (3), family (2) fishing (2), games (2), hockey (2), hunting (2), jogging (2), motorbike (2), paddle (2), pingpong (2), learn-languages (2), relaxing (2), riding (2), shopping (2), talking (2), trekking (2), act (1), athletics (1), bet (1), boardgames (1) boxing (1), cars (1), chatting (1), collecting (1), cricket (1), cycling (1), do-gymnastics (1), dolls (1), drinking (1), fighting (1), food (1), get-mushrooms (1), golf (1), go-online (1), go-to-the-cinema (1), go-out (1), hang-out (1), help (1), horseriding (1), laughing (1), martial-arts (1), paintball (1), piano (1), play-chess (1), rugby (1), selfie (1), skiing (1), skydiving (1), social-network (1), take-photos (1), teathre (1), use-the-mobile-phone (1), video (1), visit-museums (1), volunteering (1), walk-the-dog (1), watch-films (1), watch-sports (1).

According to our first research question, so far, there is evidence of prototypical word associations in response to the cue word *hobbies* by the two groups of informants. The most prototypical words shared by children and adolescents were related to the semantic field of sports (e.g. *football, tennis,*) and leisure activities (e.g. *watch tv, reading). Football* and *tennis* were the most frequent words retrieved by almost all learners from the two

groups of informants and the first written in the lexical availability test independently of age. We consider these two words are not only linguistically but also culturally prototypical owing to being two of the most played and seen sports in Spain since some of its Spanish football teams and outstanding tennis players are worldwide sport references. With regard to leisure activities, these types of words correspond to the category of hobbies per se, which includes free-time activities and school exercises.

As far as levels of categorization are concerned, the basic level of categorization excels in this sample because the words retrieved by the two groups of learners correspond to the most salient, the fastest, the shortest, and the most easily identifiable words (Xiaoyan and Georg- Wolf, 2010), which are the most central and the most representative in a category as suggested in the prototype theory (Rosch, 1975; Rosch et al., 1976, Kleiber, 1995). Despite being a radial category, hobbies did not reveal other levels of categorization (superordinate and subordinate) in the sample analysis. Nonetheless, retrieved words such as *help* and *feelings* as shown in table 1, corroborate Lakoff's notions of radial categories. According to Lakoff (1987), a radial category is distinguished by describing the prototype by means of the family resemblance theory, whose membership in a category might be based not only on the shared features but also on the non- shared attributes. Thus, in our analysis, *help* and *feelings* were counted as words belonging to the category of hobbies rather than discarded.

Concerning the number of word responses, children activated fewer words than adolescents. Our results reveal that adolescents showed an advantage over children in the production of vocabulary in a lexical availability task. Thus, we coincide with the idea that in some linguistic skills, older learners outperform younger learners as interpreted by Cenoz (2002), Lightbown (2008), and Muñoz (2008) in instructional contexts. In this study, adolescents focused their production of prototypical words exclusively on hobbies,except for the word *help*, whereas some non-shared words produced by some of the children were centered on family members or close-related people (*my mother, my grandfather, my teacher*), colors (*red, brown, pink*), and moods (*sad, happy, hungry*). To this effect, for instance, in our methodology, we count these types of words as responses to the category of hobbies. In the case of family members and close-related people, we put the possessive pronoun (my) into parenthesis as the lemmatizations and edition guidelines suggest. This possessive pronoun was not counted but we displayed it in the table so as to determine if children relate hobbies to whom they do them with. In this respect, we

consider that further research in this aspect is needed as well as to ascertain if the words on moods and colors are related to the way children feel when doing these activities. Concerning the words red, brown, green, we consider that there is an overlap of categories, since these words could be categorized under the field of colors. However, there is also the belief that these types of activated words by children correspond solely to the words learnt in class, and owing to the nature of the test they just wanted to accomplish the number of words to complete the task without considering the meaning of the category itself. We agreed with the idea suggested by Pavlenko (2009) that word association research is crucial to understanding how the process of categorization works when learning a language and how L2 EFL learners categorize vocabulary. In this sample, for instance, differences in this process of semantic categorization is reflected in the way children, in the case of adjectives, describe the quality of things, states and emotions. In contrast, older learners' production does not include adjectives to respond to the category of hobbies. In this sense, the categorization of the world is seen differently by the two groups of informants depending on their experiences, age and language level.

Moving on to our final research question, despite the different patterns of linguistic categorization in children and adolescents, there is the universality of prototypes in the word responses (*football, tennis, reading*) given to the selected semantic category (*hobbies*) despite age and language level. Our results show that regarding shared vocabulary, both groups agree in their word responses, since they are exposed to the same social and cultural backgrounds. However, when analyzing word associations to recognize universality of language, divergences and convergences in the field of semantic prototypes also emerge (Author, 2019). For instance, some divergences in the semantic category of hobbies are seen regarding children's production of words such as *pencil, headphones, rainy*, whose meanings are not closely related to the typical word association most people activate for hobbies.

5 Conclusions

Prototypical associations were evidenced in response to the prompt hobbies by two groups of EFL learners differing on age and language level. The basic level is the most salient and it is related to the interests learners might have. The number of words generated by adolescents was higher than children because factors as age and language level interfere. There is evidence of the universality of prototypes regarding the semantic category of hobbies despite age and language level differences. Lexical availability tests are useful instruments to develop research on prototypes and vocabulary. Further research on a wider sample of learners, a variety of prompts, vocabulary input in EFL textbooks and other variables apart from age and language level might be considered to bring out more evidence in terms of prototypical associations in vocabulary production in EFL settings.

*This paper is part of the AILA Europe special issue

Acknowledgements

References

Author, 2019

Author, 2021a, 2021b

Carcedo González, Alberto. 1998. Desarrollo de la competencia léxica en español LE: análisis de cuatro fases de disponibilidad. *Pragmalingüística, 5*(6). 75- 94. https://doi.org/10.25267/Pragmalinguistica.2017.i25

Catalán, J. Rosa and Julieta Ojeda. 2009. Girls' and boys' lexical availability in EFL. *ITL-International Journal of Applied Linguistics*, *158*(1). 57-76.

Catalán, J. Rosa and Julieta Ojeda. 2010. Disponibilidad léxica en inglés como lengua extranjera [Lexical availability in English as a foreign language]. *Lenguaje y Textos, 30*: 167-176.

Catalán, J. Rosa, María Pilar Agustín, Almudena Fernandez and Andrés Canga. 2014. The effect of age on EFL learners' lexical availability: Word responses to the cue words 'town' and 'countryside'. In Rosa Maria Jiménez Catalán (ed.), *Lexical availability in English and Spanish as a second language*, 37-51. Dordrecht, Heidelberg, New York and London. Springer.

Cenoz, Jasone. 2002. Age differences in foreign language learning. *ITL-International Journal of Applied Linguistics 135*(1). 125-142.

Cho, Kanako. 2010. Fostering the acquisition of English prepositions by Japanese learners with networks and prototypes. *Fostering language teaching efficiency through cognitive linguistics*, *17*, 259-276. https://doi.org/10.1515/9783110245837.257

Decreto 24/2014 de 13 de junio, por el que se Establece el Currículo de la Educación Primaria en la Comunidad Autónoma de la Rioja [From June 13th, primary education curriculum in the autonomous community of La Rioja] https://web.larioja.org/normativa?n=1973

Decreto 5/2011, de 28 de enero, por el que se establece el Currículo de la Educación Secundaria Obligatoria de la Comunidad Autónoma de La Rioja [From January 28th, secondary education curriculum in the autonomous community of La Rioja]

Duan, Jing and Hongqi Da. 2015. Semantics and Vocabulary Acquisition and Teaching. *Studies in Literature and Language 10*(6). 67-71. http://dx.doi.org/10.3968/n

Ellis, Rod. 1985. Understanding Second Language Acquisition. Oxford: Oxford University Press.

Kleiber, George. 1995. *La semántica de los prototipos: Categoría y sentido léxico* [The semantics of prototypes: category and lexical sense]. Madrid. Visor.

Lakoff, George. 1987. *Women, fire, and dangerous things: What categories reveal about the mind.* The University of Chicago Press. https://doi.org/10.7208/chicago/9780226471013.001.0001

Lenneberg, Erik. 1967. The biological foundations of language. *Hospital Practice 2*(12). 59-67.

Lightbown, Patsy. 2008. Easy as pie? Children learning languages. *Concordia Working Papers in Applied Linguistics*(1). 5-29.

Lukusa, Stephen. 2018. A Semantic prototype of the English word" Responsible" in Tanzanian usage. *Utafiti Journal*, *3*(1). 145-160.

Martohardjono, Gita and Suzanne Flynn. 1995. Is there an age factor for universal grammar? In David Singleton and Zsolt Lengyel (eds), *The Age Factor in Second Language Acquisition*, 135-153. Clevedon. Multilingual Matters

Muñoz, Carmen (eds.). 2006. Age and the rate of foreign language learning (Vol. 19). Clevedon: Multilingual Matters.

Muñoz, Carmen. 2008. Symmetries and asymmetries of age effects in naturalistic and instructed L2 learning. *Applied linguistics*, *29*(4). 578-596.

Murphy, Gregory. 2002. *The big book of concepts.* Cambridge MA. The MIT Press Cambridge. https://doi.org/10.7551/mitpress/1602.001.0001

Pavlenko, Aneta. (eds.). 2009. *The Bilingual mental lexicon: Interdisciplinary approaches*. Bristol. Blue Ridge Summit. Multilingual Matters. https://doi.org/10.21832/9781847691262

Penfield, Wilder and Lmar Roberts. 1959. *Speech and brain mechanisms*. Princeton University Press.

Rosch, Eleonor. 1975. Cognitive representations of semantic categories. *Journal of experimental psychology: General 104*(3). 192-233.https://doi.org/10.1037/0096-3445.104.3.192

Rosch, Eleonor, Carolyn Mervis, Wayne D Gray, David M Johnson, and Penny Boyes-Braem. 1976. Basic objects in natural categories. *Cognitive Psychology*, *8*(3), 382-439. https://doi.org/10.1016/0010-0285(76)90013-X

Samper H. Marta. 2002. Disponibilidad léxica en alumnos de español como

lengua extranjera [Lexical availability in Spanish as a foreign language] Málaga: ASELE.

Šifrar, K. Marjana. 2016. La universalidad de los prototipos semánticos en el léxico disponible de español [The universality of semantic prototypes in Spanish lexical availability]. *Verba hispánica*, *24*(1), 147-165. https://doi.org/10.4312/vh.24.1.147-165

Singleton, David. 2003. Critical Period or General Age Factor(s)?. In Maria del Pilar García Mayo and María Luisa García Lecumberri (Eds.). *Age and the Acquisition of English as a Foreign Language.* 3-22. Bristol, Blue Ridge Summit: Multilingual Matters. https://doi.org/10.21832/9781853596407-002

Vermeer, Anne. 2001. Breadth and depth of vocabulary in relation to L1/L2 acquisition and frequency of input. *Applied psycholinguistics*, *22*(2), 217. https://doi.org/10.1017/S0142716401002041

Wittgenstein, Ludwig. 1953. *Philosophical investigations*. New York: Macmillan.

Xia, Xiaoyan and Hans Georg-Wolf. 2010. Basic-level salience in second language vocabulary acquisition. In Sabine De Knop, Frank Boers and Antoon De Rycker. De Gruyter Mouton (Eds), *Fostering language teaching efficiency through cognitive linguistics*. 79-98. https://doi.org/10.1515/9783110245837.79

Yamada Jun, Shigenobu Takatsuka, Nobuko Kotake and Junko Kurusu. 1980. On the optimum age for teaching foreign vocabulary to children. *IRAL 18*(3). 245-247

Yuan, Rue. 1990. Semantic transferability and prototypicality in Chinese and English: A study of the semantic acquisition of" thin" by Chinese learners of English. Iowa State University dissertation

Zhang, Hongmei. 2017. A study on implication of prototype theory in English Vocabulary teaching. *Journal of Language Teaching and Research 8*(1). 113-137. http://dx.doi.org/10.17507/jltr.0801.16

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60