

## THE EFFECT OF THE KEYWORD-SEMANTIC METHOD ON THE EFL VOCABULARY LEARNING OF TURKISH STUDENTS

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### **Abstract**

*This study aimed to investigate whether the keyword-semantic method had any effect on teaching English vocabulary to Turkish students. During the initial experiments, the sample size was 864 students. In the subsequent year, it was 99 (thirty-one 7th graders and sixty-eight university students). The study was conducted in the intact classrooms of the 6th and 7th graders of five primary schools, the preparatory and first year students of four high schools and the students of Atatürk University Faculty of Education, Erzurum, Turkey. The pre-posttest interval in the initial experiments was one week. It was four weeks in the subsequent year. The control groups received a traditional instruction, which included oral/written rehearsals with word lists, use of words in sentences and arranging words based on semantic features. The treatment groups combined the semantic method with the keyword method. Each class was taught by their own teachers. The researcher, who taught university classes, briefed the other teachers about the experimented method. A 2X2 mixed design ANOVA used to compare the test results indicated that experimental groups retained significantly higher vocabulary words than the control groups highlighting the noteworthy contribution of the keyword-semantic method to vocabulary teaching.*

## TÜRK ÖĞRENCİLERİN İNGİLİZCE KELİMELERİ ÖĞRENMELERİNDE ANLAMSAL - ANAHTAR SÖZCÜK YÖNTEMİNİN ETKİSİ

### Özet

*Bu çalışma, İngilizce kelimelerin Türk öğrencilere öğretilmesinde anlamsal-anahtar sözcük yönteminin etkisinin olup olmadığını araştırmayı amaçladı. Çalışmanın ilk yılındaki deneylerde örneklem 864 öğrenciydi. Sonraki yıl, örneklem 99 öğrenciydi (otuz biri 7nci sınıftan ve altmış sekizi üniversiteden). Çalışma Erzurum il merkezindeki beş ilköğretim okulunun 6ncı ve 7nci sınıf, dört lisenin hazırlık ve birinci sınıf ve Atatürk Üniversitesi Kazım Karabekir Eğitim Fakültesi öğrencilerinin kendi sınıflarında yürütüldü. İlk yıl deneylerinin öntest-sontest arası bir haftaydı. Sonraki yıl bu ara dört haftaydı. Kontrol gruplarında öğretim gelenekseldi: Kelimeler, liste halinde sözlü/yazılı tekrarlarla, cümle içinde kullanımla ve anlamsal özelliklere göre düzenlenerek öğretildi. Deney grubunda ise anlamsal yöntem anahtar sözcük yöntemiyle birleştirildi. Her bir sınıfa ders veren öğretmen o sınıfın kendi öğretmeni idi. Diğer öğretmenleri denenen yöntem konusunda bilgilendiren araştırmacının ders verdiği sınıflar ise üniversitede okutmanlık yaptığı sınıflardı. Sınav sonuçlarını karşılaştırmak için kullanılan 2 x 2 faktöriyel ANOVA'ya göre deney grupları kontrol gruplarına kıyasla önemli derecede daha yüksek sayıda kelimeyi belleklerinde tuttu ve bu da anlamsal-anahtar sözcük yönteminin kelime öğretimine katkısının kayda değer olduğunu gösterdi.*

## **Introduction**

Motivating English L2 students is not that difficult if we take into account its importance in the world we live in. Social and economic globalization makes it necessary to use English as a means of international communication. Due to its status of lingua franca, it is used for professional, academic or commercial advancement and it is expected that this will be the case in the future. Besides its importance in science and technology, teaching English is beneficial for cultural interaction as well when it is independent from cultural dominance. However, the aim should not be the native-speaker level, which would be unrealistic; instead, the international dimension of English should be prioritized (Alptekin, 2002). Besides, the perception of the international dimension of English should not be of a kind that makes the distance from another language farther than it is.

Each country should determine their priorities according to their own contexts (Bax, 2003), who prioritized the context as a key factor in teaching English in other countries. Part of these diverse contexts is the first languages of L2 English students. If a learner doesn't exclude his or her first language, the opportunity to benefit from any possibility of crosslinguistic similarity would also not be missed. This similarity can be found between the lexicons of the mother tongue and the target language. If adequate vocabulary level is reached, this knowledge can be turned into advantage later in guessing the meaning of the contexts they were embedded. If the number of words to be acquired is high in number, the importance of such crosslinguistic similarity is higher. Since representations of conceptual overlap between two languages is on the surface forms of the words, it is necessary to focus not only to form or meaning but to their connections. In the beginning the universality of visuality is also a key factor that can influence teaching beneficially. Therefore a method or a combination of more than one method that benefits from visual images, formal and conceptual similarities can be used in teaching vocabulary. To what degree this method facilitates the learning should be researched as well in the contexts it is used to teach a foreign language. For this purpose, this study investigated the keyword-semantic method to see if it facilitates the Turkish L1 students' retrieval of English L2.

Literature was reviewed to make it clear for the reader to understand the importance of the cross-linguistic similarity implying that if it were used in foreign language classrooms, SLA of many students would be better so far. This will be followed by the literature on the keyword-semantic method as a combinatory method which uses the visual universality of mental images, semantic overlap and representations of this by linguistic surface forms. The study is original in that it aims to adapt such a method to the Turkish context.

### Literature Review

Learners can be made aware of the overlap between their first and second/foreign language. Cohen (1987, p. 53) states that L2 students tend to seek out crosslinguistic similarities. According to Ringbom (1987), phonological and semantic similarities facilitate the connection between L1 and L2 vocabulary. Carter and McCarthy (1988) emphasize the fact that second language learners use cross-linguistic connections despite their teachers' avoidance. Easton (1993) mentions the importance assigned to using interlingual connections and guiding learners' perception toward similarity and criticizes the inadequacy of the L2 teaching materials regarding benefits of cross-linguistic similarities on L2 vocabulary teaching. Ringbom (2006) criticizes the centrality of cross-linguistic differences in SLA research and criticizes the fact that only some recent works (e.g. Kellerman, 1995; Jarvis, 2000: both cited in Ringbom, 2006) mention the significance of similarities as well as differences. Ringbom (2006, p. 36) emphasizes the former as the more important concept, especially to the learner whose perception of similarity has a facilitating role for comprehension and learning.

Similarities are established more easily between related languages. However this should not be interpreted to exclude the existence of cases where it is possible to find positive transfer across totally unrelated languages exemplified by his colleague's command of Finnish (L2) and its benefit for Swahili (Ringbom, 2006). Singleton (2006) is against the view that the L2 lexicon is quite separate from the L1 lexicon, and elaborates his argument for high levels of connectivity between the L1 and L2 lexicons on the basis of a relevant review of relevant evidence: the dynamic interplay between them (Herdina & Jessner, 2001) and its demonstration by evidence of cross-linguistic influence in memory research (Papagnia et al., 1991; Service, 1993: cited in Singleton, 2006, p. 132). Nevertheless, Singleton's (2006) interpretation of these does not lead him to think that these indicate either total integration or total separation of languages, which is in parallel with Cook's (2003: cited in Singleton, 2006) argument against total separation and total integration of any two languages and emphasis on the benefit of perceiving the different degrees and types of interconnection.

In order to benefit from this multi-valued perception as regards cross-linguistic similarities, there is a need in L2 teaching to guide L2 students to perceive similarities with respect to form, meaning and form-meaning connections and use them for their acquisition of the target second language. Doughty (2004) articulates on the need in SLA studies to investigate the role instruction can play for students to be aware of the process of form-meaning connections.

### The importance of the size of the acquired vocabulary

Considering the high number of L2 words (or word families) needed to be acquired, this need turns out to be a priority in L2 vocabulary teaching. Regarding speaking skills, Schonell, Meddleton and Shaw (1956: cited in Nation, 2001, p. 114) state that the threshold should be 2000 word families.

Adolphs and Schmitt (2003) consider 2000-word level to be adequate as well, nevertheless add that it would be better to increase it to 3000-word level. According to Laufer (1997), 3000 word families (5000 words) should be taught directly to L2 learners for the transfer of L1 reading strategies, their autonomous L2 study and natural L2 acquisition. Nation and Hwang (1995: cited in Nation, 2001, p.6) emphasize the acquisition of 2000 words with high frequency level in academic discourse (1995: cited in Nation, 2001, p. 6). It was first suggested by Laufer (1989) and then Nation (1990) that 95 % coverage of the vocabulary in a text is necessary to comprehend it reasonably. Grabe and Stoller (2002, p. 186) is in consensus articulating that a reader needs to recognize 95% of the words in a text to infer its meaning. Nation (2001) noted that 95% coverage would indicate a larger size for academic contexts (4000 word families), not 3000 word families in Laufer's (1997) non-academic contexts. Cobb and Horst (2004) state that 2000 word family-level is adequate for the control of 80% of an average text; however, trajectory from this level to the 95% requires 5000 word families.

### **The necessity of direct teaching**

However, coverage does not proceed linearly as natural texts in which chances of meeting less common words drop off sharply, which implies not only the need for constructing and studying such lists and but also the necessity to avoid from relying merely to exposure to text. Exposure to text is slow and uncertain for almost all L2 learners. Thus it can justify Paribacht and Wesche's (1997) and Zimmerman's (1994: cited in Gu, 2003) argument that reading activities would lead to a good contribution to L2 acquisition if combined with special focus on vocabulary. Word-lists are useful (Laufer & Schmueli, 1997; Nation, 2001, p.241) and context use can be increased in a graded way in the subsequent levels (Coady, 1997; Meara, 1997; Nation & Newton, 1997). For a large population of L2 learners, who have academic, professional, or vocational objectives, academic word lists should be used (Cobb & Horst, 2004). A synthesis of methods is necessary, which would integrate direct teaching of words to vocabulary learning in meaningful contexts.

### **The literature on keyword method**

The keyword method is shown to be superior to rote learning, semantic processing or context use in the retention of large amount of word lists (Gu, 2003). It also benefits from lexical similarities. A keyword is an L1 or L2 word which is phonologically and/or morphologically similar to a target word, yet independent of its meaning, and it is visually associated through an image. For example, similarity of "carlin" (old lady in Scottish) to "car" can be selected and visually associated with an image of an old lady driving a car (McDaniel & Pressley, 1984: cited in Brown & Perry, 1991). Its visual oriented nature might be an advantage for its effect on several languages.

Brown and Perry's cites the studies comparing it with a no-strategy condition in wide variety of languages (e.g. Russian - Atkinson, 1975; Atkinson & Raugh, 1975, Spanish - Levin, Pressley, McCormick, Miller, & Shriberg, 1979; Pressley, 1977; Pressley, Levin, Hall, Miller, & Berry, 1980; Raugh & Atkinson, 1975, Latin - Pressley, Levin, Nakamura, Hope, Bispo, & Toye, 1980, and German - Desrochers, Gelinias, & Wieland, 1989; Hall, 1988: all cited in Brown and Perry, 1991). To these, Nation (2001) adds keyword research into Hebrew, the Phillipino language, French, Greek and Chinese. There is no mention of keyword research in Turkish context, which awakes more curiosity in terms of its use in the Turkish context.

However, this research should be in real classrooms because research findings over the last 25 years showed that this technique is superior, in word retention, to other vocabulary teaching methods (semantic arrangements, rote learning, use of words in context, rehearsal, etc.) with the exception of experiments conducted at real classrooms (Fuentes, 1976; Levin, 1979; Willerman & Melvin, 1979: cited in Gu, 2003; Hogben & Lawson, 1994: cited in Campos, Gonzales & Amor, 2003), which is essential for the ecological validity of the method making the results relevant to the practicing teachers in the field.

#### **The inadequacy the keyword technique alone**

The results should not cause too many expectations because it is limited to the core meaning, and inadequate to address several meaning senses and differences related to discourse pragmatics as well as syntactic dimensions, accurate spelling and pronunciation (Gu, 2003). Its benefit is limited to concrete words as well (Ellis, 1997: cited in Gu, 2003); furthermore it is only effective for the short term (Paivio & Desrochers, 1981: cited in Gu, 2003).

Ellis (1995) states that a keyword can cause better performance if its meaning is related to that of the target word. Retention can be enhanced if the keyword refers to a concept closely related with the target word. However, in the keyword method, this is arbitrary. This method does not necessarily encourage active elaboration at the semantic level. Semantic dimension should be combined to merging of acoustical similarity and interlinking associative image. Strategically, combination of various methods, techniques or strategies tends to lead to higher performance (Oxford, 1990). In a study comparing three treatment groups (keyword, semantic, keyword-semantic) of Arabic speaking university students who learn English as a second language, Brown and Perry (1991) found that combination of keyword and semantic methods increased retention above the other strategies. Nevertheless, the difference was not statistically significant. Their evaluation of the results suggested that it could lead to higher results if the definitions of the target words were in participants' first language. Besides it was possible that keyword subjects seemed to switch to semantic strategies due to the abstractness level of many words and systematic difficulties in generating images, which limited their use to concrete words.

A follow-up questionnaire showed such a switch to keyword-semantic method by some students themselves.

Therefore, there is a need for experimental studies to see whether significantly higher increase is seen through such a combination in comparison with traditional vocabulary teaching practice in EFL classrooms in parallel to a need to identify keyword procedures that can be applied in classroom context and whether such a strategy would suit the real-life conditions of learners from various age groups. The second question has been articulated by Campos, Gonzales and Amor (2003) as well.

### **The theoretical depth in the keyword-semantic method**

Ellis (1994) states clearly that "Brown and Perry's study [(1991)] shows that it is possible to locate vocabulary strategy research within a strong theoretical framework (Ellis, 1994, p. 554)," which is Craik and Lockhart's depth-of-processing theory (1972) that proposed greater depth of processing would lead to better retention. In order to make up for the ambiguity surrounding the metaphor "depth" Craik and Tulving's (1975) expanded version found the semantic level encodings as the most critical followed by the phonemic (with relatively low retention) and graphemic (with poorest retention) but replaced the ambiguous metaphor "depth" with a more flexible "spread" to make it clear that semantic elaboration do not necessarily always follow the structural elaboration and there is meaning in shallow processing as well although it is relatively low level of meaningfulness. Brown and Perry's (1991) prediction was of the same nature as well, as articulated by Ellis (1994), that processing that involves both shallow and deep levels was hypothesized to be more effective still.

One of the theories which provides a theoretical basis to experiment with combining keyword with semantic methods is Cermak and Craik's theory 'levels of processing' (1979, cited in Boers, Eyckmans, & Stengers, 2006), which suggests that the information processed at deep levels is retained or retrieved better. The visual dimension of the keyword is coherent with the depth of conceptual levels, with interlinking images providing deep processing. According to McNeil (1992), linguistic forms per se are limited and the multimodal nature of visual forms of thinking reflects and, is in coherence with, the multimodality of meaning. Images combine in different modalities and patterns to build up thinking, according to Ralph Ellis (1995: cited in Arnold, 1999), who considers that imagery has a significant influence on reasoning as a more basic event than thinking. When our perception of linguistic forms is connected with other forms of thinking, form-meaning connections can be built up. 'Dual coding' (Clark & Paivio, 1991, Paivio, 1986: both cited in Boers et al., 2004) is the other type of deep processing used in keywords, especially visual oriented ones. The verbal information and the mental picture associated with the verbal information each of which is stored alongside the other can be used as an extra pathway for the recollection of the information.

According to Cummins' (1979) theory "interdependency of language", there is overlap between languages, which increases as we reach deeper levels. The reflection of this underlying overlap is represented at the shallow levels: forms. Partial nature of these similarities on the surface level is suitable for the nature of human thinking, which Lakoff and Johnson (1980) consider metaphorical as reflected by the language we speak: "the metaphorical structuring of concepts is necessarily partial and is reflected in the lexicon of the language (Lakoff and Johnson, 1980: p.52). Boers et al. (2006) argue that it is the metaphors that motivate multiword units as well. Besides, according to Gestalt psychology, the human mind tends to make up for the missing parts. This theoretical framework suggests that the use of the keyword method with semantic processing would contribute more to retention/retrieval than the use of either method alone. The integration of this combination into the traditional vocabulary teaching activities might result in better vocabulary learning.

### **Purpose of the Study**

The purpose of this study was to compare such integration with the teaching pedagogy in which this combinatory method was not used. Comparable sets of experimental and control groups were selected from a variety of schools, grades and ages. The only difference for the experimental groups was the fact that their vocabulary teaching included the combination of the keyword and semantic methods to traditional vocabulary teaching practices in the schools whereas the control groups used all vocabulary methods including the semantic processing; however they did not use the keyword method at all. The effect of the method was investigated over the duration of one week between pretests and posttests during the initial experiments with a large sample size.

The reference in determining the one-week pre-posttest interval was Ebbinghaus' curve of forgetting which shows how fast forgetting occurs in the beginning: The rate of remembering is 58.2% in 20 minutes is followed by 44.2% in one hour, 35.8% in nine hours, 33.7% in one day, 27.8% in two days, 25.4% in 6 days and 21.1% in 31 days (n.d. figure of Ebbinghaus' forgetting curve, shown in Le, 2000). Ebbinghaus was one of the first modern scientists who concerned himself in L2 vocabulary acquisition (1885, cited in Woodworth & Schlosberg: cited in Schmitt, 2000) and his painstaking work "set a rigorous and scientific standard for future of L2 vocabulary acquisition" (Schmitt, 2000, p.18).

In the following year, sample size was decreased due to technical limitations like intensive curriculum but the pretest-posttest interval was increased to four weeks to see if there would be any change regarding vocabulary retrieval over time. This duration may be justifiably long with Gu's (2003) statement that keyword experiments ranged from one week to four weeks. The problem the study aimed to respond to was related to the above-mentioned comparison for all the experimental groups and all the control groups in general as well as the grades, the schools and differential effects of pretest-posttest intervals.



### **Research Questions of the Study**

**The research questions were:**

Will the combination of the keyword and semantic methods raise the vocabulary retrieval significantly for all participating students in general?

Will it be effective at each and every grade?

Will it effective for a wide range of ages?

### **Method**

#### **Design**

The design used intact classes, in other words, it used classes as they were structured in the schools. The study benefited from Widdowson's pragmatic mediation model (Widdowson, 1990), according to which experimental research procedures should be adapted for classroom use because classrooms are the contexts in which we can find the evidence that verifies the need for and the importance of the research. Besides, experiments are required for the teaching practice to gain prestige in terms of scientific rationality. Both research and teaching can contribute to each other if they are practiced in harmony (Widdowson's pragmatic mediation model, 1990). Since each class was taught by its own teacher, the author (who was both researcher and teacher at the university) had to describe specifically every step to primary and secondary school teachers for them to adapt experiment procedures to the contexts of their classrooms.

A nonequivalent control-group design (Borg & Gall, 1989) was used in this study. In each of the educational institutions selected for the study, sets of two classes were compared; one class was assigned the role of a control group; the other was assigned the role of a treatment group. Then all the control and treatment groups were compared as a whole according to the levels of education (primary, secondary and higher education levels). In all the sets compared, there was no random assignment of subjects to treatment and control groups for practical and theoretical reasons. First, the breaking up of classes would facilitate the random assignment; however, the instructional programs in which this experimental study was conducted could not tolerate this. Second reason was theoretical; generalization of the results or making them relevant to real classroom environments would be possible with the ecological validity, the ability of an experiment to approximate its methods, materials and setting to real classroom situation under study. It would lack ecological validity if we randomly assigned subjects by breaking up each class into treatment and control groups. Ecologically valid results could be reached through authentic classroom situations with authentic students, who studied with genuine motivation.

Both treatment and control groups of this experiment were highly motivated because they were informed that vocabulary component would constitute a significant part in the evaluation of their scores. Supposed to study the words in the units of their books, they learned the words intentionally, some of which was the target words of the experiment. The design selected prioritized ecological validity due to the intention of the study, which was to provide the practitioner with findings that are closer to their own classroom settings. Porte (2002) argues that this kind of design consists of the most suitable conditions to make experiments in the real classrooms.

### **Participants**

In the initial experiments, the sample size consisted of 864 students from 6th and 7th graders of 4 primary schools, English preparation students and 9th graders of 3 high schools and 1st and 2nd year students of Ataturk University. All of the groups were intact classes. The treatment groups included 437 students (50.58 % of the sample size). There were 427 students in the control groups which constituted the remaining 49.42 %. The percentage of the primary school students in the study was 40.63 %, with 351 participants. The 32.87 % of the sample size belonged to the high school category, with 284 high school students. There were 229 university participants of the study, which constituted 26.50 % of the total sample size of the study. The experiments in the following year consisted of 99 students (thirty-one 7th graders and 68 university students). All of the students were Turkish.

First pretests were administered in order to determine the vocabulary knowledge of the treatment groups and that of the control groups. Then, t-tests were used to investigate if there was any significant difference between the arithmetic means of the scores of these independent groups. No significant was found between the treatment groups and the control groups at  $p > .05$ .

### **Materials**

Vocabulary. 50-item target word lists were prepared for each grade. The target words were different according to the educational level since some learners were from primary schools, some from high schools and others were from university. Since the lists were supposed to contain unfamiliar words, they were selected from the subsequent unit of their course book they would study. Although some may have been learned the year before the experiment started, it was assumed that they may have been forgotten due to long summer holidays. The books that students benefited were the course books approved by the Turkish Ministry of Education as well as supplementary materials. Besides the teachers were asked to provide a priority list for target words they consider important for their students. Each teacher was interviewed to determine the target content words to be taught. They took final shape with their approval.

Definitions of any target items were their Turkish equivalents. The priority was given to the core meaning and their comprehension since other meaning senses can be related to the core meaning by the students subsequently.

**Keywords.** The participants of the treatment groups were provided with researcher-generated keywords. The researcher drew from feedback from the participants in the pilot experiments conducted one year before this study as well as feedback from their teachers and the teachers participating in this study. The participants of the pilot experiments had similar socio-demographic characteristics and similar ages. The mediation of the researcher-generated material to treatment classes was of first priority. The time allotted to the experiment was not adequate for the participating students to produce keywords on their own. This is supported in Hulstijn's (1997) statement that the initial applications and instructions of the keyword method should be guided by the classroom teacher and only after a certain time the students can use it skillfully on their own. The practice was not too rigid to leave out any exceptional peer-generated or participant-generated keywords guided by the examples in the material. Almost all the keywords were in Turkish, but they were not necessarily confined to Turkish. It was allowed to use more than one keyword since the variety was considered to be good for retention.

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Chain: zincir

Çene (chin)

One can't talk if the jaws are not clamped at the joint.

çay bağımlılığı (addiction to tea);

için bağlacı (the conjunction "because")

Conjunctions connect sentences or parts of sentences.

Coast: kıyı

Kaptan Kusto (Captain Cousto)

Captain Cousto associates the target word's relation to the sea.

Only one letter of a word was made salient in some keywords although they were few in number:

Comb: tarak

Kümelenmek (to be heaped up, piled up)

Think of something heaped up or piled up.

Win: kazanmak

W

Imagine the image of a winner who raises his arms with his head in between.

Winners are agile, they are fast. The concept of fastness can be expressed with the onomatopoeic "vınn".

Reverse reading gives a concept related to winning as well:

New (yeni)

Those who renew themselves win.

One

There is formal similarity. Semantic elaboration is "Number one is the winner".

Hate (nefret; nefret etmek)

We can find a neology when we combine the parts of the English words and its

Turkish equivalent: nefrate

Delicious: lezzetli

There are people who are crazy (deli) for what they consider as delicious; they eat as if there is a hole (delik) in their stomachs.

Imagine a shish kebab, which is roasted on skewers.

shsh + deli gibi acıktım (I got hungry like crazy.)

Weak: zayıf

viyak viyak

Imagine a weak animal's sound when it is weak.

Flood: sel

Fırat (the river Euphrates)

Imagine the river Euphrates' enthusiastic flow (It is a well-known river; this can be a vivid picture for the Turkish audience.

Sometimes look at a word in reverse direction can be a cue.

Library: kütüphane

Bilmek (know)

Those who look for information go to libraries.

Bil (know) + ara (search)

Lose: kaybetmek

Solmak (fade)

Fading in losing

Succession is not necessarily a condition to remind target words:

Aunt: teyze

"tonton" (darling)

The idiomatic use "tonton teyze" is a frequent collocation in Turkish associating an image of a lovely, plump aunt

Neighbor: komşu

"Ne haber, komşu?" (pragmatics for "what's up, neighbor?")

We can make the pronunciation sound like "neighbor".

Numerical keywords:

Eleven: on bir

We can combine the syllable "ven" with the fact that the image of hands with ten fingers; there are 10 fingers in our hands (eller)

Honest: dürüst

"İçi dışı bir" (word for word translation is "inside and outside are one", which means someone's inside and outside appearance is the same.)

### Instruments

Fifty target words were listed. The students assumed that the words would be tested subsequently, so their learning was intentional. To test ability of retrieval, the students were required to write their Turkish equivalents. The tests included the English word lists from the course book units scheduled to be taught in the pre-posttest interval. The direction of L2-L1 was adopted due to the translation asymmetry, which is far greater, according to Kroll (1993: cited in Hamers and Blanc, 2000, p. 191), in less fluent bilinguals. Kroll and Stewart (1994: cited in Hamers and Blanc, 2000) found semantic category interference in L1-L2 translations of bilinguals, which suggests the use of L2-L1 translations in the initial degrees of the bilingualism continuum. The distribution of each list in the study materials and tests was changed in order to prevent a possible rote-learning advantage.

As this study started out of the need for the vocabulary component, the kind of test format preferred was the discrete-point test to detect and work on it. Although this format may be criticized for measuring the language components separately, this very feature can also be interpreted to be of use in identification of problem areas, as seen in Bachman's (1990) mention of the fact as well.

In general, there is an agreement that discrete-point tests are good at reliability but they seem to raise questions at validity. However, in the context of this study, the test aimed to assess and evaluate what the retrieval progress can be instead of what the amount of vocabulary proficiency was. The structure of the item test is suitable for its focus, which is the effect of the keyword-semantic method on the progress of retrieval. Its use may be justifiable in other respects as well: There is a large sample of words needed to be covered during the study and within the testing time; it is easy to administer and mark. The items were not in context because the context into which it could be embedded would necessitate other words, which might not be in learners' competence. The test scores reveal the students' progress in learning vocabulary. During learning, students relate distinct parts of language. Thus relating smaller distinct parts may transfer its effect, though indirectly, on its parallel in the same students' ability to possess ability of relating bigger distinct parts. When teachers detect weakness in a language component or subcomponent, discrete point tests are practical to prepare to assess their students' progress on that component/subcomponent. Nevertheless, the evaluation of such kind of tests should not be over-generalized; instead they should be integrated into the process toward general proficiency tests assessing the naturalistic use of language.

## **Procedure**

The experiments during the initial year covers the 6th and 7th grades of four primary schools, the English preparation classes and 9th grades of Anatolian/super high schools (their curriculum includes an English language preparation classes prior to 9th grade), four classes at the 9th grade of a high school and the first and second year students of Kazım Karabekir Faculty of Education, Ataturk University. The following year, the participants (the 7th graders of another primary school and the Faculty students) were different from the previous year's students. For each grade one treatment and one control group were selected based on socio-demographical similarity for reasons of compatibility to compare the progress of each group based on their progress over one week in the initial-year experiments and over four weeks in the experiments of the subsequent year. The difference between the treatment and the control groups was the keyword method, which was integrated into the instruction of the treatment group as a combination with semantic methods. The test durations were 20 minutes.

The teacher of a treatment group and the control groups with which it was compared was the same, except the classes of one high school. In both one-week and four week pre-posttest intervals of the study, two hours were scheduled for direct teaching of the target vocabulary. Then it was up to the students to review them later. The students also came across these words in contexts. In order to maintain high student interest in instruction and testing, students were told that this was the first time that their method had been used among Turkish speakers learning English and that their results would be carefully analyzed to see how helpful their method of instruction was. Grading. Answers elicited on the paired-associate tests were evaluated by the researcher. It was optional for the teachers who participated in the study to measure and evaluate the tests due to the intensity of their work. Nevertheless, many of them measured their students' performance on the tests as well. One point was given to each Turkish equivalent of each test item. Total score was 50 for each test.

## **Results**

### **Preexperiment Measures**

In order to check for pre-experimental differences, the experimental group and the control group were compared on the basis of the pre-experimental test scores which indicated no significant differences between the compared groups to the favor of the treatment groups.

### Experimental Measure

The study compared the treatment group and the control group based on their scores from the pretest, which was administered prior to the experiment and the posttest, which was administered after the experiment. Porte (2002) states that due to the technical difficulties of an experimental study in the authentic classrooms of educational institutions quasi-experiments can be preferred instead of pure experiments, which are good for randomization but not for ecological validity.

The 2X2 mixed design ANOVA was a reasonable and very practical option because it investigated the means of the pretest and the posttest and the study groups (factors) and allows the researcher to study the effects of these factors separately (their main effect) and together (their interaction effect).

Both pretests and posttests in the two groups made it possible to have an idea of the progress made in relation to target vocabulary, and to allow a reliable comparison. The 2 x 2 factorial designs made it possible to study the main effects and allowed to test for interactions among variables. Due to the risk which the number of interactions brings to interpretation of results, it was advantageous to work with the 2 by 2 factorial design.

Due to the comparisons of two independent groups and their two levels, 2 X 2 factorial ANOVAS were performed for the comparison of the independent variables and the dependent variables. The treatments were the combinations of levels (pretest and posttest) of the factors (the treatment group and the control group). The results of the analyses of variance revealed that each keyword-semantic group's retrieval increased statistically significantly in comparison to the control group (See Tables 1-16). In other words, in the repeated measures ANOVA conducted, the joint effect of the two factors in each comparison was found to be statistically significant. According to the results of the first year experiments, the interaction effect of all the treatment groups and all the control groups was ( $F(1,862) = 99.445, p=.000$ ) (See Table 2.). The interaction effect of the two factors was ( $F(1,349) = 82.662, p=.000$ ) (See Table 4.) for the primary school category, ( $F(1,282) = 38.635, p=.000$ ) (See Table 6.) for the high school category and ( $F(1,227) = 19.120, p=.000$ ) (See Table 8.) for the university category.

In the second year experiments, the findings showed differences between groups based on a four-week pretest-posttest interval. Each of these findings indicated statistically significantly higher increase on the part of the performance of each treatment group. The interaction effect of two factors was ( $F(1, 29) = 24.905, p=.000$ ) (See Table 10.) in the 7th grade for the primary school category. The interaction effect in the university group was found to be ( $F(1, 66) = 21.707, p=.000$ ) (See Table 12.).

The performance of the treatment groups to retrieve the target English words was significantly better as shown by the significantly higher increase of retrieved words. After the encouragement from these findings from one-week pretest-posttest interval, the second year experiments conducted over duration of four weeks indicated the effect of the



method over time. The results were the same for the students from several grades or educational levels in primary and high schools and the university.

### Discussion and Conclusion

With respect to the research questions of the study, it may seem reasonable to suggest that if the keyword method is introduced to the classrooms in Turkey in combination with the semantic methods it seems to have a promising potential to be able to facilitate Turkish students' retrieval of English words. The consistency in the pattern of success in the variety of grades and schools and in more than one year increases the reliability of the study. The variety of memories involved facilitates the subjective bias in the nature of association. Tulving (1983) distinguished episodic memory and semantic memory. The method draws from both episodic and semantic memories. For example, the Turkish word "asure" (a kind of dessert in Turkish cuisine) may not taste delicious to a Turkish student. However, the general knowledge (semantic memory) that it is considered a very delicious by a large number of people helps him/her to complement an episodically weak level of activation with semantic memory. Nevertheless, the limitation of these memories is that they are both forms of declarative knowledge; practice is a must to turn them into procedural knowledge, which can be described by information processing models (eg. Anderson's ACT model, 1983, 1985: cited in Mitchell & Myles, 1998). The mental lexicon can not be regarded as separately stored from other kinds of knowledge in long-term memory and there is a consensus among most theorists as regards this matter (Aitchison, 1987; Lakoff, 1987; Levelt, 1989: all cited as in Hulstijn 1997, p. 211).

In this combinatory method, namely the keyword-semantic method, the visual images sometimes bizarre, weird or humorous - engaged the attention and helped of the beginner level student to connect to the conceptual overlap his or her first language represents in another linguistic form partial similar to and partial different from the target language. This partiality should not be perceived as a disadvantage because, as Lakoff and Johnson (1980) argue, the nature of conceptualization of human thinking is also partial and the source of its evidence can be seen in the language. The theoretical basis of the method can be interpreted in a way to connect the superficial forms with the depth of meaning, which they represent on surface. Theories support generalities and principles which inform the teaching practice along with the experimental research. This study combined the theoretical dimension with the experiments. It was not a pure experimental study because the contextual complexities of real classroom teaching are suitable for the quasi-experimental studies, which can be conducted practically and give information relevant to authentic classroom contexts. The emergence of this study was influenced by Brown and Perry's (1991) study, which indicated the keyword-semantic method's beneficial effect on university students. Self-criticism of their own study suggested that it was worth to try the experimented method because it could result in significantly higher results for treatment groups than those for control groups in primary schools, high schools or universities if the mistakes Brown and Perry (1991) mentioned regarding their study were not repeated. Since they are relevant for teachers who teach in circumstances similar to those in this study.

According to Brown and Perry (1991), it is a must in research to demonstrate the effect of certain strategies not only in the laboratory but in the classroom as well.. This study was inspired by the author's belief that there are interconnections among the languages of the world and these interconnections could be used to teach vocabulary of these languages. The keyword-semantic method was a suitable method that allowed the study of such interconnections. English was prioritized due to its status as a lingua franca. Due to the uniqueness of the contexts in which English is taught and learned, the Turkish context was one of the contexts the effect of the method could be investigated with experiments.

The interlingual overlap is more at the conceptual depths but the information processing at the semantic level produces better memory traces if performed in connection with the surface level of form. If processing occurs only at acoustic or visual levels, this leaves the semantic encoding out of the picture; memory traces would not be durable. Elaboration which occurs at a number of levels produces even stronger recall, retention or retrieval.

The quality of the encodings leads to connecting both surface level similarities and conceptual relations they represent. The mental exercises of connecting conceptually overlapping parts of L1 and L2 with their representative parts on the surface levels suggested that the very practice of "spreading elaborations" can reflect its effects onto higher-order processes. Lightfoot (2005) argues that lexicalization and grammaticalization should be perceived to be a reconcilable distinction. Boers et al.'s (2006) argue that the metaphors which motivate the multiword units borrow their insights from Cognitive Linguistics, which holds that the lexical composition of many multiword units is motivated rather than arbitrary. As Lee (1980) stated, "spreading elaboration" can be simultaneously and continuously combined with the other elaborative process of the general elaborative process, that is, integration of information into higher level units of abstraction in the interplay between bottom-up (data driven) processes and top-down processes.

The use of keyword-semantic methods entails an explicit rather than implicit - teaching or learning. As for the longer terms of English proficiency, the process of the explicit instruction, which is particularly important for beginning level students to reach a threshold level, could be accelerated with such memory strategies. During this process, the method, which is practiced as teacher-oriented in the beginning stages, can be taught to the students as a strategy instruction. They can use it on their own in the reading activities for which they have already developed a functional lexicon to benefit from passages for contextual guesses and learn vocabulary through reading. Combination with reading activities makes up for the depth of vocabulary (different meaning senses, pragmatic differences). The progress the students can make in terms of reading skills can reflect to other skills as well.

Nation (1990: cited in Tekmen & Daloglu, 2006) states that both implicit and explicit methods of vocabulary acquisition are vital; nevertheless he contends that the contextualized vocabulary activities should take more of class time than the decontextualized activities.

However, this should not be interpreted as his favor for any of them or without an awareness of the need to teach memory strategies to deal with single words outside the class time, which is rather limited, since Nation (Asian EFL journal's interview, November, 2006) assigns a very important role for deliberate learning of single words. It is just that Nation's approach (Asian EFL Journal's interview, November, 2006) is in favor a balance of opportunities for learning. Rather than an absolute acceptance of a method, he suggests teachers integrate such methods in a well-balanced course design.

It should also be kept in mind that there is not a fixed pattern from explicit, decontextualized to implicit, contextualized activities due to the high percentage of 98 as a minimum for reading lexicons (as stated by Nation & Coady, 1988 as well as Hu & Nation, 2000: both cited in Tekmen & Daloglu, 2006). Introduction of well-constructed academic word lists and explicit study of these facilitate the learners' job to reach the threshold level, which it is not realistic to assume that they can only acquire through reading (Cobb & Horst, 2004).

### **Limitations**

We should have cautious optimism in the generalization of the results of this study. The best benefit could show itself in connection with the awareness of its limitations. First of all, in parallel to Gu's (2003) warning about the experiments of the keyword method, it should never be forgotten that the issues regarding the long and complex process of SLA can not only be explained by experiments. Secondly, even if the keyword method was combined with semantic methods in this study, it was limited to the retrieval of core meanings of L2 words. There were no participants below the age of 13. Besides, both Turkish and English languages use Latin alphabet. Thus, the results may not be generalized to languages like Chinese, Arabic or Russian.

Most importantly, there are significant limitations as to pragmatic or sociolinguistic differences meanings, different meaning senses, and the possibility of finding no semantic equivalence between L1 and L2 (as in some literal multiword units) as well as pronunciation of target words. It may be perceived as limited especially as regards the kind of multiword units in which the meaning of the parts do not have access to the meaning of the whole. If it is assumed that the end of a language test is measuring the naturalistic language use, the results should not be overgeneralized in terms of validity.

### Recommendations

The semantically related keyword connections should be practiced with in classrooms. Teachers should be open to integrate this combinatory method into teaching foreign languages and teaching strategy use by equipping themselves with this strategy complement. This memory strategy should be taught to foreign language learners, and students should be equipped to generate keywords and to appreciate and benefit from the keywords generated by their teachers and peers.

In the future, it may be interesting to involve participants below the age of thirteen. It would also be interesting to investigate the effect of the keyword-semantic method not only the single words but also multi-word-units. This may be conducted indirectly; Nation (Asian EFL Journal's interview, November, 2006) mentions that there is a very large group of multiword units which "have both a literal meaning and a figurative meaning and the connection between these two meanings can be found through teacher explanation, or by the learners applying an interpretation strategy."

In further research, it would be interesting to study the roots as well as they can be used to derive meaning of the words of which they constitute parts. It would also be good if vocabulary is assessed through tests that measure and evaluate naturalistic language use. Other alternatives are also possible. Generation of keyword by the students themselves and their peers may also be studied in Turkish contexts. Not only the direct but also the indirect benefits of the method may be investigated. The process of learning English words through semantically elaborated keywords may be beneficial to cognitive skills, such as analysis, memory and inferring. Cook (1991) states that development of such skills is one of the objectives of foreign language teaching in Britain. Other countries may direct their foreign language policy based on these objectives as well.

The other advantage the keyword-semantic method may contribute to education in general is the activation of the right hemisphere through visual forms of thinking. The use of brain imaging technology can give insights into the creative activities using the keyword-semantic method. The interactions between the left and right hemispheres can find its counterpart in the combination of keyword and semantic methods, which combines the visual forms with the linguistic ones.

**Table 1**

*Means and Standard Deviations for All Students in Treatment Groups and All Students in Control Groups in First-year Experiments*

<u>Method Deviation</u>	<u>N</u>	<u>Mean</u>	<u>Standard</u>
Pretest Keyword-semantic	437	14.09	11.61
Traditional method	427	15.12	12.14
Posttest Keyword-semantic	437	31.31	14.10
Traditional method	427	24.13	13.14

**Table 2.**

*ANOVA Results for All Students in Treatment Groups and All Students in Control Groups in First-year Experiments*

Source of variance	ss	df	ms	f	p
Between groups	222883.213	863			
(Group) Keyword-semantic/ Traditional	4102.441	1	4102.441	16.164	$p=.000$
Error	218780.772	862	253.806		
Within groups	144508.307	864			
(Measure) Pretest Posttest	74290.650	1	74290.650	1017.214	$p=.000$
Group * Measure	7262.809	1	7262.809	99.445	$p=.000$
Error	62954.848	862	73.033		
Total	367391.520	1727			

**Table 3.**

*Means and Standard Deviations for All Students in 6th and 7th grades in 1st Year Experiments*

<u>Method Deviation</u>	<u>N</u>	<u>Mean</u>	<u>Standard</u>
Pretest Keyword-semantic	8.05	183	8.53
Traditional method	168	10.50	10.65
Posttest Keyword-semantic	183	23.08	12.93
Traditional method	168	15.32	9.14

**Table 4.**  
*ANOVA Results for All Students in 6th and 7th grades in 1st Year Experiments*

Source of variance	Ss	df	ms	f	P
Between groups	59069.208	350			
(Group) Keyword-semantic/ Traditional	1462.947	1	1462.947	8.863	$p=.003$
Error	57606.261	349	165.061		
Within groups	38090.919	351			
(Measure) Pretest Posttest	16437.369	1	16437.369	327.678	$p=.000$
Group * Measure	4146.600	1	4146.600	82.662	$p=.000$
Error	17506.950	349	50.163		
Total	97160.127	701			

**Table 5.**  
*Means and Standard Deviations for All Students (English Preparation Classes and 9th Grades) in High School Groups in 1st Year Experiments*

Method deviation	N	Mean	Standard
Pretest Keyword-semantic	10.34	139	17.73
Traditional method	145	16.88	9.97
Posttest Keyword-semantic	139	31.77	11.23
Traditional method	145	24.81	10.03

**Table 6.**  
*ANOVA Results for All Students (English Preparation Classes and 9th Grades) in High School Groups in 1st Year Experiments*

Source of variance	ss	df	ms	f	p
Between groups	53462.456	283			
(Group) Keyword-semantic/ Traditional	2162.758	1	2162.758	11.889	$p=.001$
Error	51299.698	282	181.914		
Within groups	28098.424	284			
(Measure) Pretest Posttest	17122.856	1	17122.856	500.219	$p=.000$
Group * Measure	1322.503	1	1322.503	38.635	$p=.000$
Error	9653.065	282	34.231		
Total	81560.880	567			

**Table 7.**  
*Means and Standard Deviations for University Students in 1st Year Experiments*

<u>Method deviation</u>	<u>N</u>	<u>Mean</u>	<u>Standard</u>
Pretest Keyword-semantic	14.01	115	18.57
Traditional method	114	19.68	14.29
Posttest Keyword-semantic	115	43.87	8.55
Traditional method	114	36.25	11.62

**Table 8.**  
*ANOVA Results for University Students in 1st Year Experiments*

Source of variance	ss	df	ms	f	p
Between groups	44374,079	228			
(Group) Keyword-semantic/ Traditional	1217,743	1	1217,743	6,405	$p=.012$
Error	43156,336	227	190,116		
Within groups	78223,677	229			
(Measure) Pretest Posttest	50171,441	1	50171,441	440,186	$p=.000$
Group * Measure	2179,293	1	2179,293	19,120	$p=.000$
Error	25872,943	227	113,978		
Total	122597,756	457			

**Table 9.**  
*Means and Standard Deviations for Treatment and Control Groups at the 7th Grade of Veyis Efendi Primary School (the 2nd Year Experiment of the Study)*

<u>Method deviation</u>	<u>N</u>	<u>Mean</u>	<u>Standard</u>
Pretest Keyword-semantic	1.98	18	5.17
Traditional method	13	4.54	4.39
Posttest Keyword-semantic	18	36.50	13.84
Traditional method	13	15.54	12.27

**Table 10.**

*ANOVA Results for Treatment and Control Groups at the 7th Grade of Veyis Efendi Primary School (the 2nd Year Experiment of the Study)*

Source of variance	ss	df	ms	f	p
Between groups	11028.390	30			
(Group) Keyword-semantic/ Traditional	1759.216	1	1759.216	14.402	$p=.001$
Error	122.154	29	122.154		
Within groups	10141.193	31			
(Measure) Pretest Posttest	6763.774	1	6531.305	107.952	$p=.000$
Group * Measure	1560.419	1	1297.776	24.905	$p=.000$
Error	1817.000	29			
Total	21169.583	61			

**Table 11.**

*Means and Standard Deviations for the Treatment (1st Year Students of the Department of Preschool Education) Control Groups (2nd Year Students of Department of Psychological Counseling and Guidance) at Kazim Karabekir Faculty of Education, Ataturk University*

Method Deviation	N	Mean	Satandard
Pretest Keyword-semantic	9.39	45	11.13
Traditional method	23	11.78	6.94
Posttest Keyword-semantic	45	37.69	10.52
Traditional method	23	26.22	11.71

**Table 12.**

*ANOVA Results for the Treatment (1st Year Students of the Department of Preschool Education) and Control Groups (2nd Year Students of Department of Psychological Counseling and Guidance) at Kazim Karabekir Faculty of Education, Ataturk University*

Source of variance	ss	df	ms	f	P
Between groups	10308.610	67			
(Group) Keyword-semantic/ Traditional	891.321	1	891.321	6.247	$p=.015$
Error	9417.289	66	142.686		
Within groups	17304.310	68			
(Measure) Pretest Posttest	12786.876	1	12786.876	248.261	$p=.000$
Group * Measure	1118.052	1	1118.052	21.707	$p=.000$
Error	3399.382	66	51.506		
Total	27612.920	135			



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## YÜKSEK ÖĞRETİMDE BİYOLOJİ EĞİTİMİ İLE SAĞLANAN DAVRANIŞ DEĞİŞİKLİKLERİ

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*Atatürk Üniversitesi Fen Bilimleri Enstitüsü*

### Özet

*Her dönemde insanlara faydalı olan biyoloji, ülkemizde ilkokuldan üniversiteye kadar eğitim sürecinin bütün basamaklarında değişik konular kapsamında okutulmaktadır. Çalışma; bu süreçte biyoloji eğitimi alan yüksekokul öğrencilerinde biyoloji dersinin hedeflediği davranış değişikliklerine ne oranda ulaşıldığını belirlemek amacıyla yapıldı. Araştırmaya Atatürk Üniversitesinde 3 farklı programa devam eden son sınıf öğrencilerinden 112 öğrenci katıldı. Katılan öğrencilere araştırmanın amacına uygun olarak 20 soruluk anket uygulandı.*

*Anket sonuçlarına göre biyoloji eğitimi sayesinde yüksekokul öğrencilerinde % 73.9 oranında biyoloji eğitiminin yarattığı davranış değişiklikleri ile insanın kendisine, çevresine ve dünya barışına katkıda bulunacağı şeklinde davranış değişiklikleri edinebileceğinin yanıtı alındı.*

**Anahtar Sözcükler:** *Biyoloji Eğitimi, Davranış Değişikliği.*