Gesture and its impact of resolving lexical ambiguity

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Abstract

The study aimed to shed light on the use of gesture in resolving lexical ambiguity employed by TEFL students. To this end, 60 intermediate Iranian learners, studying at Kish Way Language School in Iran were recruited. The participants were randomly put into two experimental groups and one control group. Both of the experimental groups received the same teaching approach, i.e. teaching homonyms through gesture, but the control group learned homonyms through Audio-lingual method. The results showed the value of gesture in resolving lexical ambiguity. Moreover, to investigate whether or not there was any significant relationship between spatial and kinesthetic intelligences on the one hand and the ability to resolve lexical ambiguity on the other, a Pearson correlation procedure was used. The results showed a significant relationship between spatial/ kinesthetic intelligences and the ability to resolve lexical ambiguity.

Key words: Gesture, Lexical ambiguity, Homonymy, Spatial intelligence, Kinesthetic intelligence

Introduction

Psychologists, language learning specialists and language teachers have been interested in learning vocabulary for a noticeable stretch of time. Researchers have attempted to obviate possible difficulties and complexities in this regard. Since learning any language is based on its vocabulary and distinguishing the meaning that each word conveys, approaching this goal, i.e., learning vocabulary without difficulty with long-term retention, requires various tasks. In general, there are two ways of teaching vocabulary: the explicit way which is direct, intentional, and conscious both in and out of the context; and the implicit one which is indirect, accidental, and subconscious. The present study will focus only on the explicit method.

Additionally, in learning vocabulary the most prominent difficulty that learners encounter is words with more than one meaning which cause uncertainty among learners in recalling the exact meaning of a word. Petten (2006) believes that these vocabularies not only put learners in trouble but influence their comprehension as well. Among words with multiple meaning - ambiguous words- homonyms are very demanding. One of the major reasons for this problem is the students' lack of knowledge of homonyms. One way to alleviate this problem is by

highlighting the role of this type of words in EFL classrooms, conducting research on ambiguity and helping learners from the early stages of language learning.

There are two general types of ambiguity: syntactic and lexical ambiguity. Lexical ambiguity includes two components: homonymy and polysemy, the former concerns words with the same pronunciation but two different unrelated meanings, and the latter involves words with one pronunciation and two or more distinct but related meanings; it leads to several difficulties and impedes recalling words. Italso postpones word processing and creates problems in communication, interaction and comprehension, (Kidd & Holler, 2009); therefore, it is necessary to deal with it in order to enhance learning a foreign/second language.

Various studies have been conducted resolving lexical ambiguity.According to Holler and Beattie (2005), gesture eases lexical retrieval; additionally, speaking with hands and body posture indicates the intentions of interlocutors more clearly; moreover, Butcher and Goldin-Meadow (2000) posit that adding gesture to word provides children with an extra way of communication that helps them to convey their meaning just through simple hand movement even before theholophrastic stage, (e.g., show a cup while uttering "mine"). Gestures increase learners' awareness and noticing, and internalize the content and sense of words (Kidd & Holler, 2009). It resolves lexical ambiguity by facilitating lexical recalling (Alibali, Kita & Young, 2000; Holler & Beattie, 2005). It stimulates younger children's speech and acts as a complementary component through speaking for adults (Göksun, Hirsh & Gollinkoff, 2009).

Regardless of the specific language teaching method adopted to teach certain content, a number of suggestions have been made for procedures which help students to develop their knowledge on ambiguous words. This research presents a new technique for dealing with ambiguity in words with multiple meanings through gesture among EFL learners and will also attempt to investigate the relationship between two kinds of intelligence – spatial and kinesthetic- in learning ambiguous words. In the present study, only homonyms are taken into consideration. For this purpose, the present study aims to address the following research questions:

1. Does gesture have any effect on resolving lexical ambiguity and influence learning?
2. Are there any significant relationships between spatial/kinesthetic intelligences on the one hand and the ability to resolve lexical ambiguity on the other?

Review of the literature

In language learning, vocabulary plays a significant role (Alavi & Keivanpanah, 2006). One of the controversial issues in second language learning, like other pedagogical fields of study is finding the best methods of teaching. Additionally, the most problematic aspect of learning vocabulary is ambiguity, which means the probability of defining an utterance in two or more obvious forms that has become the center of attention. Petten (2006) believes that these vocabularies not only put learners in trouble but influence their comprehension, as well. Moreover, Broaders et al., (2007) and Kidd and Holler (2009) claimed that by the use of gesture speakers reveal and transfer some aspects of information while speaking that are not

observable in their speech. According to other scholars, hand movement especially for teachers and in school context could be useful for retrieving not only concrete but also abstract concepts (Alibali et al., 2000; Göksun, et al., 2009; Kelly et al., 2008; Studdert-Kennedy, 1993). According to Iverson and Goldin-Meadow (2005), in the process of language learning, children take advantage of hands movement to convey the meanings that they are not able to utter by words. Thus, gesture is a learning facilitator, supplementary and a reinforcing aid for learners (Asher, 1966; Göksun, et al., 2009; Iverson & Goldin-Meadow, 2005).

Ibraheem and Khan (2012) claim that using hand makes gesture a speech technique; Moreover, many language instructors and teachers confirm the positive effect of gesture on learners' memorization (Asher, 1966; Göksun, et al. 2009; Macedonia & Von Kriegstein, 2012; Tellier, 2008; Tellier, 2009). Some scholars believe that gesture simultaneously benefits from two senses of the learners, i.e., their aural and imagination in transferring teaching material while discourse and speaking do this in an explicit way. Indeed, using body motion through teaching guarantees transferring abstract concepts (Goldin-Meadow & Wagner, 2005; Macedonia & Von Kriegstein, 2012; Ping & Goldin-Meadow, 2008; Tellier, 2009).

As ambiguous words seem to cause difficulty in language system, Gillon (1990) states that the notion of ambiguity is prominent for linguists and philosophers, too. Lexical ambiguity includes two components: homonymy and polysemy (Bach, n.d.); according to Kidd and Holler (2009) homonymy concerns words with the same pronunciation but two different unrelated meanings, and polysemy includes words with one pronunciation and two or more distinct but related meaning. Homonymy is a subcategory of lexical ambiguity; therefore, it is concerned with ambiguous words. They are words with common tone and distinct meanings (Jacobson, Lapp & Flood, 2007). Clare (2003) believes that ambiguity is the most outstanding dilemma in language processing. Lexical ambiguity creates an effortful, challenging situation among students and might mislead them in finding an appropriate meaning for words. Because lexical ambiguity affects information retrieval and constrains finding suitable sense for items, it must be resolved (Krovetz & Croft, 1992).

Since disambiguating in a text or context is *word sense disambiguation,* Navigli (2009) believes that for the sake of ambiguity of language, context is a key factor which determines exact lexical interpretation. Regarding the role of gesture in resolving ambiguity, Kidd and Holler (2009) discuss the advantage of gesture as a disambiguation tool. The movement of head, arm, body and face expresses an idea or meaning and enhances transferring unmentionable information.

Howard Gardner is the first psychologist who proposed the theory of Multiple Intelligences Theory (MIT) in 1983. According to Uzunöz (2011), this hypothesis in comparison with traditional techniques is more helpful for learners and their learning. According to Nolen (2003), some people are better language learners than others due to their intelligence type. In language learning and teaching, Multiple Intelligence plays a prominent role (Armstrong, 2007).

Zarei and Mohseni (2012) mention that through utilizing MIs activities learners would be more motivated. So applying them in language instruction can help meeting learners' needs and interests. As for the effectiveness of using multiple intelligences activities in curriculum design Uzunöz (2011) believes that giving information to the students and assessing them promote learning quality and meet the learners' requirements in the best possible way. Moreover, Mirzazadeh (2012) states that benefiting from this theory specifically in language learning classrooms can stimulate learners to make progress not only in learning material but also in their social lives.

Methodology

Participants

To accomplish the objectives of this study, two experimental groups were employed which included 60 female EFL students at Kish Way Language School in Iran-Karaj. The participants were at the intermediate level of proficiency. They were given the Cambridge Key English Test (KET) in order to be homogenized at the outset of the study from whom 40 students were chosen. The participants' ages ranged from 16 to 35 and were divided randomly into two equal groups of twenty. Additionally, there was a control group of 20 candidates with the same level of proficiency.

Materials

To achieve the goal of this study the following tests were utilized by the researcher: (1) Key English Test (KET) for homogenizing the learners based on their general English proficiency prior to the treatment. (2) Quizzes based on the teaching materials were given in the format of definition writing tests and question stimuli. (3) Gardner's multiple intelligences questionnaire was given to the candidates to determine their intelligence profile (kinesthetic and spatial-visual).

A sample KET was used for homogenizing the participants at the outset of the study. KET consists of four parts: reading and writing, listening and speaking.

The sample KET used in this study originally consisted of 75 reading and writing, listening and speaking items (45 reading & writing questions and 15 listening items plus 15 speaking questions ranging from easy to difficult daily conversations). The time allocated for the KET was one hour and 15 minutes (one hour for reading, writing and listening plus 15 minutes for speaking).

Two raters participated in the rating of these two sections: the first author and one of her colleague who held an MA in TEFL with around 8 years of teaching experience. In accordance with the objective of the present study, the researchers used some tests on homonyms. Among homonyms we considered 20 items as a test of homonyms. The language of the items was at the proficiency level of the learners.

In order to recognize what type of intelligence (spatial or bodily-kinesthetic) the learners use to understand homonyms through gesture, in what intelligence the candidates are stronger and finally to answer the second research question, the multiple intelligences questionnaire

was administered to the participants to specify their intelligence profile. Although the original questionnaire consisted of 90 statements related to each of the nine intelligences, based on the research questions of the present study, participants answered just two parts of the related intelligences namely, kinesthetic and spatial ones which consisted of 20 items based on Howard Gardner's multiple intelligences questionnaire

Procedure

After homogenizing the learners via Cambridge English test (KET), These 40 students were randomly put into two experimental groups with 20 students in each one. There was also a control group to which homonyms were taught in a traditional mechanical drill as in Audio-lingual method through repetition, illustration and memorization. All the classes were taught by one of the researchers to minimize the impact of teacher variability during the 6 sessions of instruction which lasted for half a month (three sessions a week). The third session was allocated to Gardner's intelligence questionnaire.

Firstly, in order to teach homonyms as an ambiguous word in both experimental and control groups the researcher wrote the word "homonymy" on the board with a colored marker and pronounced it. Then, the researcher tried to make the definitions of homonym as understandable as possible, because this concept was new to the learners. For clarifying the meaning of homonyms some examples of homonym pairs were given such as "bank, bat and so on" which were showed to the learners in flashcards using magnet that one by one she put on the board. During defining and exemplifying she turned back and pointed to the written word on the board i.e. homonym repeatedly, in order to trace the learners' memory and draw their attention to the teaching concept. In this part the researcher benefited from speech only strategy.

In the second phase and the third session of teaching homonyms, the researcher added body gesture to each homonym's meaning in the experimental groups in order to make sure that the participants' used pantomime as a visual aid. Most of the gestures that the researcher utilized were iconic and deictic ones. This part was motivating for the learners for the reason that, it created an interesting, full of fun atmosphere, which was believed to enhance learning. Gesture-speech strategy was used in this phase.

As for the control group, the researcher utilized hand drawn pictures on the board and illustrated the homonyms in order to make meanings clear. This session ended with Gardner's multiple intelligences questionnaire containing 20 statements given to the participants. It included 20 items, ten of these statements tested the spatial-visual intelligence and the other ten described the bodily-kinesthetic intelligence. The allocated time to do this was ten minutes.

In the fourth session, the teacher called the learners to come to the board individually, she showed a homonym pair to each of them to write the word on the board, mime its meaning. The other learners were given an opportunity to negotiate its meaning and interact with the teacher under her monitoring which produced an atmosphere of a cooperative problem solving among them in resolving ambiguity. The performers of this task were free to use

gesture or a combination of gesture and speech. In the control group, during the fourth session, the same procedure was employed by the researcher.

In the third phase of teaching homonyms, the researcher prepared some sentences with underlined homonyms and the learners were asked to choose the correct meaning presented in front of each sentence in parentheses. This method was used to investigate the effect of context on finding appropriate meaning. At the end of this session, the researcher gave a list of homonyms taught to the participants, comprising 30 homonyms with their pictures and meanings, 5 per page, in order to help them to review, if needed. To end the lesson, the learners used exercises to internalize the homonyms and evaluate the participants' understanding through several tests such as matching, defining and multiple choice tests.

It should be noted that the content validity of the test was taken for granted because it was based on the taught materials; and the reliability was estimated to be .83 using the K-R21 reliability formula.

Results

The first research question attempted to see whether gesture affects EFL learners' lexical disambiguation. To answer this question, an independent samples t-test was run to compare the experimental and control groups' mean scores on lexical ambiguity. Descriptive statistics including the mean and standard deviationare summarized in Table 1.

Table1. Descriptive Statistics of Lexical Ambiguity by groups

Group	**N**	**Mean**	**Std. Deviation**	**Std. Error Mean**
Experimental	40	20.38	3.585	.567
Control	20	14.40	4.871	1.089

As displayed in Table 1 the mean scores for the experimental and control groups on lexical ambiguity are 20.38 and 14.40, respectively. That is, the mean of the experimental group (mean = 20.38) is higher than the mean of the control group (mean = 14.40). To see whether or not the difference between the means was statistically significant, an independent samples t-test was run. The results are given in Table 2.

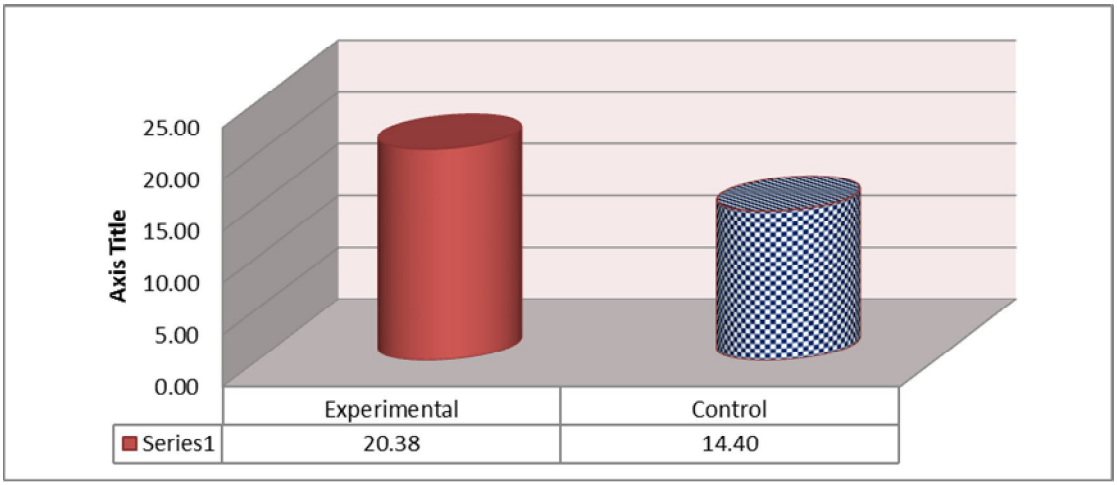
Table2. Independent t-test of Lexical Ambiguity by Groups

	Levene's Test for Equality of Variances		**t-test for Equality of Means**					
	F	**Sig.**	**T**	**Df**	**Sig. (2.tailed)**	**Mean Difference**	**Std. Error Difference**	**95%Confidence Interval of the Difference Lower Upper**

	2.981	0.90	5.385	58	.000	5.975	1.110	3.754	8.196
Equal variances assumed			4.866	29.630	.000	5.975	1.228	3.466	8.484
Equal variances not assumed									

The results of the independent samples t-test (t (58) = 5.38, P = .000 < .05) indicate that there was a significant difference between the experimental and control groups' mean scores on the lexical ambiguity. Thus, it can be concluded that the experimental group who received gesture-based treatment outperformed the control group on lexical ambiguity test. It should be noted that the assumption of homogeneity of variances was met (Levene's F = 2.98, P = .090 > .05). That is why the first row of Table 4.3, i.e. "Equal variances assumed" is reported.

Graph 4. Lexical Ambiguity by Groups



Graph 4 clearly shows that there was a significant difference between the experimental and control groups after administering the treatment.

The second research question aimed to see whether there was a relationship between spatial and kinesthetic intelligences on the one hand, and the ability to resolve lexical ambiguity. To this end, the Pearson correlation procedure was run. The results of the correlation procedure are given in the following table.

Table3. Pearson Correlation Spatial and Kinesthetic Intelligence with Lexical Ambiguity

		Lexical Ambiguity
Spatial intelligence	Pearson Correlation	.119
	Sig. (2-tailed)	.364
	N	60
Kinesthetic intelligence	Pearson Correlation	.290*
	Sig. (2-tailed)	.024
	N	60

***. Correlation is significant at the 0.05 level (2-tailed).**

Based on the results displayed in Table 3 it can be concluded that:

A: There is a non-significant and weak relationship between the students' spatial intelligence and their performance on the lexical ambiguity test ($r(58) = .11$, $P = .364 > .05$).

B: There is a statistically significant, but low, positive relationship between the students' kinesthetic intelligence and their performance on the lexical ambiguity test ($r(58) = .29$, $P = .024 < .05$).

Discussion and conclusion

The present study was aimed to investigate the effect of using gesture on lexical disambiguation among EFL students as well as the relationship between spatial and kinesthetic intelligences and learning homonyms via gesture.

The first research question in the present study focused on the importance of using gesture in resolving lexical ambiguity by EFL learners. The results provide fairly strong support for the effect of gesture. Many studies have been conducted on ambiguity resolution, but there are a few studies on using gesture in resolving ambiguity involved in homonyms (e.g., Kidd & Holler, 2009). Concerning the use of gesture in teaching, Göksun et al. (2009) believed that adults use gesture as a complementary aid in order to convey their meaning. Further, findings of the present study are compatible with the notion that gesture plays an important, facilitative role not only in the learning process, but in the cognitive aspect of this phenomenon, as well (Broaders et al. 2007; Cook & Goldin-Meadow, 2006; Göksun et al. 2009; Holler & Beattie, 2005; Kidd & Holler, 2009; Tellier, 2009).

Furthermore, numerous studies have shown that gesture has a positive impact on resolving lexical ambiguity, learning and comprehending homonyms (Alibali et al. 2000; Broaders et al. 2007; Butcher & Goldin-Meadow, 2000; Cook & Goldin- Meadow, 2006; Kidd & Holler, 2009).

According to Kelly et al. (2008), gesture can be used in teaching curriculum, a suggestion which is supported by the findings of the present study. Moreover, it can be concluded that the proposed technique, i.e. using gesture, can be used to resolve lexical ambiguity, as an effective way in language classrooms. Regarding the advantages of gesture in teaching instruction,Brown (1941) noted human brain is divided in two hemispheres; namely, right and left hemispheres where the right part is responsible for visual and auditory images and

the left part is associated with logical, mathematical and analytical information processing. Additionally, he believed that people with left brain dominance answer verbal questions but may not be professional in body language interpretation, but people with right brain dominance are good at remembering images and interpreting body language.

In sum, as these two parts of the brain work together and complete each other's duties, it can be concluded that through utilizing gesture as body language in teaching instruction, teachers take advantage of dual channels (gesture plus verbal instruction), or what Tellier (2005) called motor-modality, which can be used to help learners in thinking, analyzing, illustrating, remembering, interpreting, recognizing, recalling and learning teaching material better; therefore, it is beneficial for teachers who intend to help their learners to learn a second language.

The other finding of the present study was that there is a significant relationship between spatial- kinesthetic intelligences on the one hand and the ability to resolve lexical ambiguity on the other. This finding is in accordance with a number of previous studies (Christison, 1996; Gardner, 1999; Mirzazadeh, 2012; Nolen, 2003; Skehan, 1998; Uzunöz, 2012), which found that learners' intelligence is an effective tool in teaching instruction.

Zarei and Mohseni (2012) noted that different domains of learning are influenced by various intelligences and MI theory is a predicator of language learning. The findings of the present study can be linked to Gardner's (1993) multiple intelligence theory as a way for all teachers to explore the best method for all students. In accordance with the present study Mirzazadeh (2012) believes that by recognizing learners' different intelligences, we can give them at least a better opportunity of problem solving. In the same vein, the findings of the present study lend support to those of Xie and Lin (2009) with Taiwanese university students who found that understanding students' intelligence type and using their governing, dominant intelligence in teaching and learning will enrich teaching course content.

At the same time, the findings are different from a number of studies. The present study shows that learning homonyms through gesture is affected by multiple intelligences (spatial/ kinesthetic), but Razmjoo (2008), and Saricaoglu and Arikan (2009) found that MI profiles do not lead to better language learning. Razmjoo (2008) found that there is no significant relationship between language learning and intelligence type in the Iranian context. The result of a study done by Saricaoglu and Arikan (2009) on the relationship between the students' gender and MI profiles and their achievement in grammar, listening and writing in foreign languages found no relationship between spatial, kinesthetic and intrapersonal intelligences and success in learning grammar. Zarei and Aleali (2013) conducted an experiment to determine the relationship between spatial and linguistic intelligences and learning the phonological, semantic and orthographic aspects of words in foreign language vocabulary learning. In contrast with the present study, their findings revealed that there is no relationship between lexical aspect and spatial and linguistic intelligences.

To conclude, as the concept of multiple intelligences has recently become the focus of attention and teaching methods have move toward learner centered approaches; attending to learners' needs and motivating them, and being aware of learners' intelligence type paves the

way for achieving instructional goals. Although, the above mentioned areas of conflict are probably indicative of the need for further research, perhaps what makes this study different from other studies is that the present research was carried out in an EFL context, while most of the mentioned studies were conducted in ESL settings.

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