THE ROLE OF PICTURES AND GESTURES AS NONVERBAL AIDS IN LEARNING ENGLISH WORDS AS THE SECOND LANGUAGE IN PRESCHOOL CHILDREN

[1]KOKAB KHALILI PAJI, [2]SIAVASH TALEPASAND, [3]FARAHNAZ KIANERSI

[1]Masters in Educational Psychology, Department of Psychology and Educational Sciences of Semnan University, Semnan, Iran
Associate professor of Educational Psychology, Department of Psychology and Educational Sciences of Semnan University, Semnan, Iran
Assistance professor of Educational Psychology, Department of Psychology and Educational Sciences of Semnan University, Semnan, Iran
E-mail: Kokab_kh@yahoo.com, Stalepasand@semnan.ac.ir, Kianersi.f@gmail.com

Abstract- Background: The aim of the present study was examining the role of pictures and gestures as nonverbal aids in learning English words as the second language in preschool children. **Methods:** Sixty 4-6-year-old pre-school children (30 girls and 30 boys) consisted the participants of the present study. They were selected by available sampling method among kindergartens in Tehran. All children completed Meaning Recall Test and Comprehension Test after instruction and in follow-up. Data were analyzed using repeated measures analysis of variance. **Findings:** Findings showed that comprehension in word + gesture condition was better than word+ picture condition and word - only condition. In follow-up, comprehension in word+ gesture condition was better than two other conditions. **Conclusion:** Nonverbal aids are effective in increasing learning. Stability of learning with gesture is more appropriate than other aids.

Key words- Meaning recall, Comprehension, Gesture, Picture, Word.

I. INTRODUCTION

Language as the most important communication tool, has attracted a lot of attention to itself. Children learn language in the early years of life and can communicate effectively with people around them. Paivio's Dual Coding Theory (1971, 1986) assumes that verbal and nonverbal information are processed in two separate systems that mutually supportive each other. Two systems allow information to be more readily retrieved, resulting in better recall for information presented in two modalities over input merely presented in one modality (e.g., either verbally or nonverbally). Among the teaching methods that can be used in language teaching is the use of non-verbal aids including pictures and gestures.

A gesture is a form of non-verbal communication in which visible body movements transmit special messages instead of speech or along with the speech. Gesture can be used in learning a foreign language because it attracts learners' attention and results in dynamics of learning (Tellier, 2008). If gestures are generated at the time of learning new words, they increase memory compared to the time that are only coded verbally (Zimmer, 2001) and cause delay in forgetting (Macedonia & Kriegstein, 2012). Pictures can be used in teaching English words. Pictures facilitate learning words and result into deeper process of information (Cohen, 2012; Ganea, Best, Dockrell & Braisby, 2006). Dual Coding Theory claims that the ways in which verbal and nonverbal mechanisms contribute to learning will vary with the specific task and stimulus characteristics, past and present events and individual differences such as gender (Clark & Paivio,1991). Several researches have examined gender differences in learning second language and concluded that girls have higher ability in learning second language compared to the boys (Payne & Lynn, 2011) and are better than them in verbal tasks (Bornstein, Hahn & Haynes, 2004; Galsworthy, Dionne, Dale & Plomin, 2000). There are also researches that imply there is no gender difference in learning English and both boys and girls are the same in performance (Allendorfer et al., 2012; Ryan, Kreiner & Tree, 2008).

In the present study, the role of pictures and gestures as nonverbal aids in learning English words in pre-school children was examined. In researches that have been done in this field, the role of some variables such as gender was not considered. Therefore, it can be asked that what is the role of nonverbal aids in learning English words in pre-school children? And whether the effect of these aids is different in children based on the gender?

II. METHODS

Participants. All children of kindergartens in Tehran in 2014 consisted the statistical population of the present study. Sixty 4-6-year-old children (30 boys and30 girls) who were selected by available sapling method among 4 kindergartens in Tehran, consisted the subjects of the present study. Inclusion criteria

included: 1. The child be at the age of pre-school and 2. The child be able to pass the instructional part of the experiment. Exclusion criteria included: Child not to be able to pass the instructional part of the experiment and 2. The child not to be willing to attend the study.

Instruments. Word Recall Test and Comprehension Test were used in the study. These tests included words that were instructed to children. In each condition (picture, gesture, word), different words were used. Median of stability coefficients in two weeks was .56 to .25 for Word Recall Test and Comprehension Test, respectively.

Procedure. Firstly, English vocabulary treasure was examined in children and 6 words that were not taught to children, were selected. The words included 'Sunflower', 'Tongue', 'Gum', 'Rug', 'Scissors' and 'fig'. Six objects related to the desired words were showed to the child and (s)he was asked to identify the objects to find whether the child knows the English name of those words or not. Then, a puppet called 'Tom' was introduced to the child and it was explained by the researcher that Tom comes from another place and speaks a different language and calls the objects with different names. In the practice stage, two new objects were selected that were different from the objects used in the experiment. This actually was a practice for the child to learn the English names for familiar objects. In the first phase, there were three conditions including word+ gesture, word+ picture and word-only to instruct 6 new words. Two words were instructed in each condition. After instructing and testing the first group of words, they were reviewed again. The words should have been in the same order and condition that were instructed. Then, three words were instructed in three learning conditions including word+ gesture, word+ picture and word-only. After instructing and testing the second group of words, they were reviewed again. The words should have been in the same order and condition that were instructed. The words and the method of instructing them are reported in Table1. In follow-up, to assess word recall, the child was asked the Persian name of 6 words and was asked to say their name in English, and then the answers were written. Children were instructed and tested individually by the researcher. Each session lasted about 20 minutes for each child and instruction and testing totally lasted two weeks.

Ethical considerations. All parents were asked to give written consent for their children's participation in the study.

Data analysis. Data were analyzed using repeated measures variance analysis.

Findings

Mean and standard deviation of scores of Word Recall Test and Comprehension Test in word+ picture, word+ gesture and word-only conditions based on gender were reported in Table 2.

Table1 Words and the way of instructing them

Stages	Words instructed by picture	Words instructed by gesture	Words instructed alone
The first stage	Sunflower 	Tongue The researcher takes out her tongue and shows it to the child	Gum -
The second stage	Rug 	Scissors The researcher moves her hands mimicking motion of scissors	Fig -

Table2 Mean and standard deviation of word recall and word comprehension in follow-up and three instructional conditions based on gender

Condition	Variable	Gender	Posttest		Follow-up	
			Mean	St.d	Mean	St.d
Word+Picture	Recall	Girl	0.53	0.62	0.56	0.62
		Boy	0.60	0.56	0.40	0.56
	Comprehension	Girl	1.20	0.66	1.43	0.50
		Boy	1.06	0.52	1.06	0.52
Word+gesture	Recall	Girl	1.03	0.80	1	0.83
		Boy	1.06	0.78	0.86	0.81
	Comprehension	Girl	1.43	0.62	1.73	0.44
		Boy	1.16	0.74	1.50	0.62
Word-only	Recall	Girl	0.20	0.40	0.20	0.40
		Boy	0.20	0.48	0.26	0.52
	Comprehension	Girl	1.26	0.69	1.16	0.79
		Boy	0.93	0.78	0.93	0.73

Repeated measure variance analysis was used to analyze the data. First, the statistical assumptions were examined. The result of Box's M test confirms the assumption of equality of covariance (Box's M = 107.30, F = 1.07, p > .05). Findings show that the assumption of sphericity is observed in recall variable (Mauchly's W= 0.96, p > .05) and comprehension variable (Mauchly's W= 0.86, p > .05). Findings of Multivariate test indicate that interaction effect of gender and condition (λ_{wilks} = .99, $F_{4,55}$ = 0.12, p >.05), interaction effect of gender and time (λ_{wilks} = .96, $F_{2,57}$ =.96, p > .05), interaction effect of condition, time and gender (λ_{wilks} = .91, $F_{4,55}$ =1.35, p > .05) were not significant. The interaction effect of condition and time were significant. The gender factor effect (λ_{wilks} = .84, $F_{2,57}$ = 5.31, p < .01), time factor (λ_{wilks} = .89, $F_{2,57}$ = 3.27, p < .05) and condition factor (λ_{wilks} = .46, $F_{4,55}$ = 15.87, p < .001), interaction effect of condition and time (λ_{wilks} = .84, $F_{4,55}$ = 2.59, p < .05) were significant.

Univariate tests were used for interaction effect of condition and time. Findings showed that interaction effect of condition and time is not significance for word recall (F = 1.07, p > .05) but it is significance for word comprehension (F = 4.02, p < .05, η^2 = 0.06). That is, word comprehension in word + gesture condition was better than word + picture condition (d_{mean} = 0.26, p < .05) and word-only condition (d_{mean} = 0.38, p < .05). Comprehension English words in word+ gesture condition, word + picture condition and word-only condition is stable in follow-up. The results showed the interaction effect of condition and time is significant. Participants comprehension in gesture+ word condition is more stable compared to the word + picture condition. Participants' comprehension in gesture + word condition is more stable compared to the word + picture condition and word-only condition. There was not a significant difference between word + picture condition and word-only condition in comprehension in follow-up.

CONCLUSION

The first finding of the present study was that comprehending English words were affected by instructional conditions, so that participants had better performance in word + gesture condition and word+ picture condition compared to word-only condition. This finding was consistent with the results of studies by Fusaro et al. (2014), Krönke et al. (2013), Tellier (2008) and Hostetter (2011). This finding is explained by Paivio's Dual Coding Theory (1971, 1986) that assumes Verbal and nonverbal information are processed in two separate systems that mutually supportive each other. Two systems allow information to be more readily retrieved, resulting in better recall for information presented in two modalities over input merely presented in one modality (e.g., either verbally or nonverbally).

The other finding of the present study was that recalling and comprehending English words in word+ gesture condition, word+ picture condition and word-only condition was not different in boys and girls. Although there are several studies, about both kids and adults, that females are better than males in tasks related to language, but there are studies that show gender differences in learning language is not significant. Finding of the present study is consistent with the findings of studies done by Allendorfer et al. (2012), Halpern (2000), Jackson and Rushton (2006), and Ryan et al. (2008); and is inconsistent with the findings of studies done by Bornstein et al. (2004) and Rowe et al. (2013).

The other finding of the present stud was that comprehending English words in those 3 conditions has difference in follow-up in case of stability. Findings show that instructing based on nonverbal aids do not help recalling the words. This is the unique finding of this study. Based on three-stage information processing theory by Atkinson – Schifrin (Olson & Hergenhan, 2011) using nonverbal aids such as gesture causes the gesture to act as an self-generate cues and relate the data in long-term memory to contents in short-term memory and cause the learning to become significant for the individual. This will can cause creation of propositional systems based on pictures in the individual that can explain the sustainability of what the learned.

The first limitation of this study is that subjects were selected by available sampling method. Also, participants were put in a study with repeated measures design in three experimental conditions. Repeated measures designs have some inherent problems (learning transfer, familiarity with principles and the test). The other limitation is about the measurement tools. Each test consisted of three words. Preliminary investigations showed that participants do not have the needed ability for implementing longer tests, therefore, 6 words were used for Word Recall Test and Word Comprehension Test with 2 words in each situation. Anyway, this way of measuring has some limitations such as the small number of the items and lower reliability. Other limitation is related to the place that it was done. It is conducted in kindergartens in Tehran so generalization of the results should be done cautiously.

It is recommended this study be done on children in other parts of country to provide some evidence of extending the findings. On the other hand, it is recommended to use tools with more appropriate reliability. Considering the results of this study, it is recommended teachers consider word+ gesture condition and word+ picture condition simultaneously to increase the level of learning in educational environments.

REFERENCES

[1] Allendorfer, J. B., Lindsell, C. J., Siegel, M., Banks, C. L., Vannest, J., Holland, S. K., et al. (2012). Females and Males Are Highly Similar in Language Performance and Cortical Activation Patterns During Verb Generation. *Cortex*, 48, 1218–1233.

[2] Best, R. M., Dockrell, J. E., & Braisby, N. (2006). Lexical Acquisition in Elementar Science Classes. *Journal of Educational Psychology*, 98(4), 824–838.

[3] Bornstein, M. H., Hahn, C., & Haynes, O. M. (2004). Specific and General Language Performance Across Early Childhood: Stability and Gender Considerations. *First Language*, 24, 267–304.

[4] Clark, J. M., & Paivio, A. (1991). Dual Coding Theory and Education. *Educational Psychology Review*, 3(3), 149–210.

[5] Cohen, M.T. (2012). Strengthening Science Vocabulary through the Use of Imagery Interventions with College Students. *Creative Education.*1251-1258.

[6] Fusaro, M., Vallotton, C. D., & Harris, P. L. (2014). Beside the Point: Mothers' Head Nodding and Shaking Gestures During Parent–Child Play. *Infant Behavior and Development*, 37,235-247.

[7] Galsworthy, M. J., Dionne, G., Dale, P. S., & Plomin, R. (2000). Sex Differences in Early Verbal and Non-verbal Cognitive Development. *Developmental Science*, 3,206–215.

[8] Ganea, P. A., Pickard, M. B., & Deloache, J. S. (2008).Transfer Between Picture Books and the Real World by Very Young Children. *Journal of Cognition and Development*, 9, 46-66.

[9] Halpern, D. F. (2000). *Sex Differences in Cognitive Abilities* (3rd Ed.) Mahwah, NJ: Lawrence Erlbaum Associates.

[10] Hostetter, A. (2011). When Do Gestures Communicate? A Meta-Analysis. *Psychological Bulletin*, 137, 297–315.

[11] Jackson, D. N., & Rushton, J. P. (2006). Males Have Greater G: Sex Differences in General Mental Ability from 100,000 17- to 18-year-olds on the Scholastic Assessment Test. *Intelligence*, 34, 479–486.

[12] Krönke, K. M., Mueller, K., Friederici,A.D., & Obrig, H.(2013). Learning by Doing? The Effect of Gestures on Implicit Retrieval of Newly Acquired Words .*Cortex*, 49, 2553-2568.

[13] Macedonia, M., & Kriegstein , K.V.(2012). Gestures Enhance Foreign Language Learning. *Biolinguistics*, 6,3-4, 393-416.

[14] Payne,T.W .,& Lynn,R.(2011).Sex Differences in Second Language Comprehension. *Personality and Individual Differences*, 50, 434-436.

[15] Rowe, M. L., Silverman , R . D., & Mullan , B.E.(2013). The Role of Pictures and Gestures As Nonverbal Aids in Preschoolers' Word Learning in A Novel Language. *Contemporary Educational Psychology*,38, 109-117.

[16] Ryan, J. J., Kreiner, D. S., & Tree, H. A. (2008). Gender Differences On WAIS-III Incidental Learning, Pairing, and Free Recall. *Applied Neuropsychology*, 15, 117–122.

[17] Tellier, Marion. (2008). The Effect of Gestures on Second Language Memorization by Young Children. *Gesture* ,8(2), 219-235.

[18] Zimmer, H. (2001a). *Why Do Actions Speak Louder Than Words. Action Memory As a Variant of Encoding Manipulations Or the Result of a Specific Memory System?*

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