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Semantic Skill in Persian-speaking in Identical Twins

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***Abstract*—Lexical Vocabulary is the special ability of children to learn many things about words. The aim of this paper *was* to study specific aspects in the development of the language acquisition skills of Persian-speaking identical twins and compare them with fraternal twins and singletons. The test subjects were 109 children. In this paper, the main tests and their composite quotient in Test of Language Development (TOLD-3)[1] whose validity and reliability have already been verified by Iranian researchers are used. Three subtests; picture Vocabulary (understanding words), relational Vocabulary (Mediating vocabulary) and Oral Vocabulary (Defining words) were analyzed to assess understanding and meaningful use of spoken words in semantic skill. The statistical analysis of the data was done by using the SPSS software package, version 16. The results of the study show that no significant difference among semantic *quotient* scores exists for the three groups. The statistical significance of this test is P=0.536. The results of this research show that Persian-speaking twins, both identical and fraternal, are not at a greater risk of delayed development of language skills than singletons. This result is similar to results obtained in other countries.**

***Index Terms*—semantic quotient, identical twins, fraternal twins, singletons, Persian-speaking, test of language development (TOLD-3)**

I. Introduction

Language is a purely human and non-instinctive method of communicating ideas, emotions and desires by means of voluntarily produced symbols (Sapir, 1921) Saussure believed that a language can be compared to a sheet of paper. Thought is one side of the sheet and sound the reverse side. Just as it is impossible to take a pair of scissors and cut one side of the paper without at the same time cutting the other, so it is impossible in a language to isolate sound from thought, or thought from sound." (Saussure, 1983).

The rules of a language, also called grammar, are learned as one acquires a language. These rules include phonology, the sound system, morphology, the structure of words, syntax, the combination of words into sentences, semantics, the ways in which sounds and meanings are related, and the lexicon, or mental dictionary of words. When you know a language, you know words in that language, i.e. sound units that are related to specific meanings. However, the sounds and meanings of words are arbitrary. For the most part, there is no relationship between the way a word is pronounced (or signed) and its meaning (Fromkin and Rodman, 2002). The only language [people] ever speak perfectly is the one they learn in babyhood, when no one can teach them anything is a first language acquisition. Language users are able to produce and understand an unlimited number of sentences. This can only happen if, as children, they have acquired the grammar for their language. Children acquire grammatical rules comes from their speech errors, which often provide valuable clues about how the acquisition process works (William O'gradi, 2003).

Child's language acquisition is an unconscious process in which the child learns his/her mother's tongue. In all children, regardless of their cultural background, language acquisition occurs at about the same age, and follows similar stages. In the late 19th century, research on child development with emphasis on language acquisition, started. Many researchers kept extensive diaries of their children's development, including language (e.g., Ament 1899; Baudouin de Courtenay 1974;Compayré1896; Lindner 1898; Major 1906; Preyer 1882; Ronjat 1913; Stern&Stern 1928; Sully 1896; Taine 1870; see also Campbell 2006). Previous studies have reported contradictory results with regard to the child's acquisition. Study of twins is a valuable method for studying language acquisition in children: by comparing identical and fraternal twins, as well as twins of different sex, one can obtain some information regarding the genetic and sexual factors affecting language acquisition. Cunningham et al. said (2008) twins resulting from the fertilization of two separate eggs are more common, and are called di-zygotic or fraternal twins. In one third of the cases, twins develop from the division of one fertilized egged. Such twins are called mono-zygotic or identical twins.

Day (1932), Hay et al. (1984), Dood and McEvoy (1994), Zazzo (1960), and Savic (1980) show that language skills in twins, as well as in multiplets, lag behind the language skills of children of the same age. The effect is more

[1] Test of Language Development (TOLD)- 3rd edition

pronounced for boys. Kobayashi et al. (2000) have studied the special features in the language of twins. They carried out the Japanese version of the Illinois Test on a sample consisting of 24 pairs of twins 3 to 4 years of age. Their work indicates that their language skills fall in the normal range. Several previous studies have investigated the influences of genetic and environmental on development of language skills such as vocabulary, phonology, syntax, and lexical knowledge (Hohnen & Stevenson, 1999; DeThorne, 2006; Kovas et al., 2005; Petrill, Deater-Deckard, Thompson, Samuelsson et al., 2005, 2007).However, other works, such as Philip et al. (2000), Plumin et al. (1988), Rithweld et al. (2000), have shown that both genetic and environmental factors can affect the early development of language skills in children. Thrope (2006) in an article title "Twin children's language development" reviewed the evidence on twin language by addressing five key questions. So, Result of her study show that in twins language delay is related to the social language.

In Iran several studies have examined the process of language acquisition in children, yet none of these studies involved twins except for Mir-Dehghani and Imani (2012) who in an article title "the difference between sex and abilities of twins to use Persian vocabularies in the framework of The MacArthur-Bates Communicative Development Inventories" have considered a few cases of twin pairs. Their results show that there is a significant difference with the average performance of twins in the lexical words. While in other respects the performance is close to similar average between them. The variety of lexical words in boy better than the girl.

Teymouri and Dokhani (2014) have shown in a case study that identical twins in semantic skill were not different from a singleton in subtests, but had a better performance in compound yield. No time lag was observed in language acquisition skills. In another phonological study conducted by Teymouri and Dokhani (2014) showed that comparatively fraternal twins had a significant difference than identical twins and singletons. The results of this research show that Persian-speaking fraternal twins, are at a greater risk of delayed development of language skills than two other subjects group. Teymouri et.al. (2014 and 2015), also surveyed Speech and language development of IVF Children. The results showed that IVF children are not at great risk of speech and language development delay.

II. Methodology

In this work the visual, relational, and oral vocabulary of 14 pairs of identical twins, 41 single children, and 20 pairs of fraternal twins, all aged between 3 and 6 were examined using TOLD -3 tests. TOLD test is comprised of nine subtests which are subdivided into main and complementary tests. TOLD has Nine subtests which measure various aspects of oral language: The main tests include Six Subtests which are Picture Vocabulary, Relational Vocabulary, oral Vocabulary, Syntactic Understanding, Sentence Imitation, Morphological Completion, and Three Complementary tests: Word Discrimination, Word Analysis, and Word Articulation. The composits score as a results of the these 6 subtests were used for the major dimensions of language: Spoken Language Quotient, Listening Quotient, Organizing Quotient, Speaking Quotient, Semantic Quotient, Syntax Quotient and overall language ability.

The present study was a case-control study. Participants were Iranian identical and fraternal twins and singletons tested in Tehran. The samples in the present study included 41 singletons including 19 boys and 22 girls, 14 pair identical twins; 16 boys and 12 girls and 20 pair fraternal twins with the same 20 boys and 20 girls. All of the children were Farsi-speaking females and male that all aged between 3 and 6, who attended nursery schools in Tehran. In this study, we did not control for non-lingual factors such as the educational level of the parents and their social standing. The participants of the study were selected randomly from the kindergartens of Tehran City. A correct answer is scored as one; an incorrect answer is scored as zero. Whin participant answer 5 incorrect answers continuously, stopped the subtest. The time for each subtest are about 20-25 minute. Informed consent was obtained from the parents before the fill the questionnaire.

The first subtest was a picture vocabulary which is a semantic test. This test has a 30 items and measure the understanding of children from meaning is relevant to Persian words. The children would be shown one of the four pictures as an answer of meaning the word that examiner asks him/her. The next subtest was relational vocabulary which also is a semantic test and has a 30 items. This test measures the abilities of children in an oral speech and shows the relationship between two words. This is not a picture writing and children should be understood the word meaning and indicated their meaning class and expressed their relationship. The last subtest was an oral vocabulary. This subtest had 28 items and show the abilities of children in the oral introducing of common Persian words which asks him/ her by examiner. The last subtest was an oral vocabulary. These subtests had 28 items and show the abilities of children in the oral introducing of common Persian words which asks him/ her by examiner.

The best sign of children function in the subtest is measured by standard scores. Standard scores are the converted form of the first scores. In fact, the standard score prepared to measure of innate individual abilities of speech in children for examiner.

The semantic quotient, in fact; is the sum of scores in three subtests, picture vocabulary, relational vocabulary and oral vocabulary. This test has a high level of validity. The statistical analysis of the data was performed by using the SPSS software package, version 16. The variables were described by descriptive statistics. As all outcome variables were categorical, Variance test and Tukey Test, as applicable, were used and a P. Value <0.05 was taken as significant. The results of this research are shown in tables and graphs.

III. Results and Discussion

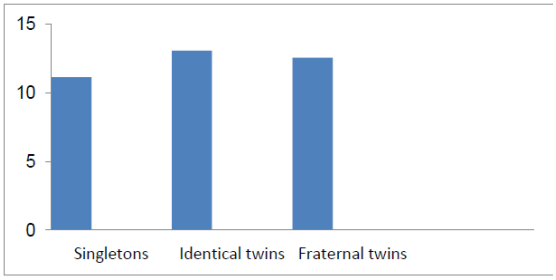
A. Picture Vocabulary Subtest

What has been discussed in table one is a comparison of the grades of main subtest which was done variance analysis test to compare grades of three different subject groups. In all statistical tests, the level of meaning is than 0.5 is a sign of meaningfulness of the test.

Statistical points are relevant to the variable of the picture vocabularies which are shown in table one. The data which are shown in this table show that there is a massive difference between the three different participant groups exist (singletons, 11.14; identical twins, 13.07 and Fraternal twins, 12.5). In other words the variance analysis survey shows that there is a meaningful difference among the results of the three participant groups exist. The level of meaningful difference is at 0.021.

TABLE I.
THE COMPARISON OF THE GRADES OF THE PARTICIPANTS OF THE THREE GROUPS. (SINGLETONS, IDENTICAL TWINS AND FRATERNAL TWINS)

Subtest	Participants	number	Mean	Standard deviation	Standard error	Minimum	Maximum	P-Value	Result
Picture Vocabulary	Singletones	41	11.14	3.19	0.49	4	17	0.021	Meaningfulness
	Identical twins	28	13.07	2.70	0.51	6	18		
	Fraternal twins	40	12.55	2.94	0.46	5	18		
	total	109	12.15	3.06	0.29	4	18		



Graph I. The comparison of the grades of the participants of the three groups (singletons, identical twins and fraternal TWINS).

TABLE II.
THE COMPARISON OF THE GRADES OF THE PARTICIPANTS OF THE THREE GROUPS

subjects	number	Subset for alpha = 0.05	
		1	2
singletons	41	11.14	
Fraternal twins	40	12.55	12.55
Identical twins	28		13.07
total		0.124	0.744

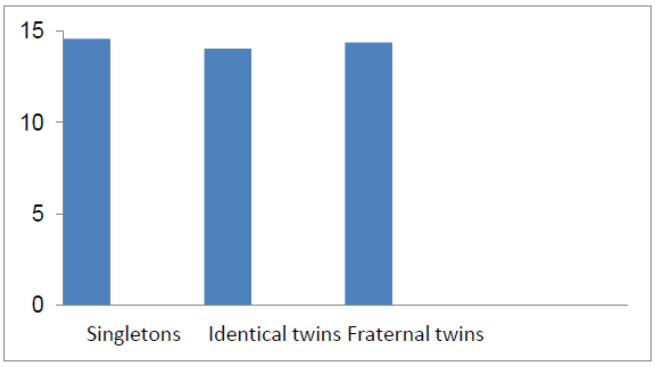
Whenever in a variance analysis test the level of meaningfulness is concerned. To show the difference among each member of the group the method of one by one comparison is utilized. The average shows that among the singletons 11.14 were the grade, 12.55 were the grade of fraternal twins and 13.07 were the grade of identical twins. By the means of the online survey, it is shown that the average of identical twins is the highest of all and singletons score the lowest and the fraternal twins sat in the middle. In other words, it can be concluded that the online survey is reaffirmed by the means of Toukey survey.

B. Relational Vocabulary Subtest

All statistical points with regard to relational vocabulary subtest are shown in table three. The data show that there is a no meaningful difference between the three different subject groups exist (singletons, 14/58; identical twins, 14/03 and fraternal twins, 14/37). In other words the online survey shows that there is no meaningful difference among the results of the three subject groups exist. The level of meaningful difference is at 0.607.

TABLE III.
THE COMPARISON OF THE GRADES OF THE PARTICIPANTS OF THE THREE GROUPS. (SINGLETONS, IDENTICAL TWINS AND FRATERNAL TWINS)

Subtest	Participants	number	Mean	Standard deviation	Standard error	Minimum	Maximum	P-Value	Result
Relational Vocabulary	Singletones	41	14.58	2.59	0.40	6	19	0.607	No meaningfullness
	Identical twins	28	14.03	1.79	0.32	11	18		
	Fraternal twins	40	14.37	2.15	0.34	9	18		
	total	109	14.36	2.23	0.21	6	19		



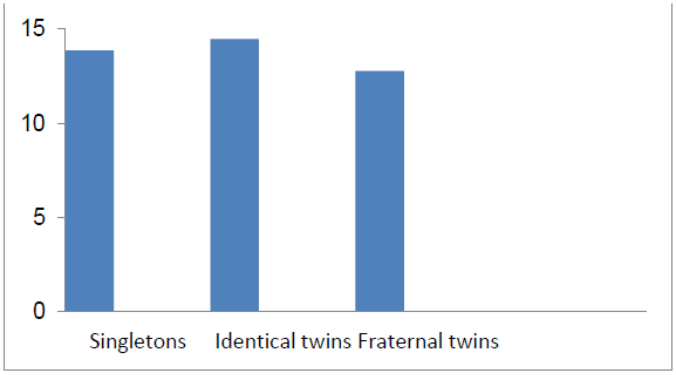
Graph II. The comparison of the grades of the participants of the three groups (singleton, identical twins and fraternal twins).

C. Oral Vocabulary Subtest

Statistical points are relevant to the variable of the oral vocabularies which are shown in table four. The data which are shown in this table show that there is a no difference between the three different subject group exist (singletons, 13.87; identical twins, 13.46 and fraternal twins, 12.77). So, the comparison of three subjects group which done with variance statistical test shows that there is no meaningful difference between the results of the three subjects group exist. The level of meaningful difference is at 0.153.

TABLE IV.
THE COMPARISON OF THE GRADES OF THE PARTICIPANTS OF THE THREE GROUPS. (SINGLETONS, IDENTICAL TWINS AND FRATERNAL TWINS)

Subtest	Participants	number	Mean	Standard deviation	Standard error	Minimum	Maximum	P-Value	Result
Oral Vocabulary	Singletones	41	13.87	3.08	0.48	7	18	0.153	no meaningful
	Identical twins	28	13.46	2.56	0.48	10	18		
	Fraternal twins	40	12.77	1.87	0.29	10	16		
	total	109	13.36	2.58	0.24	7	18		



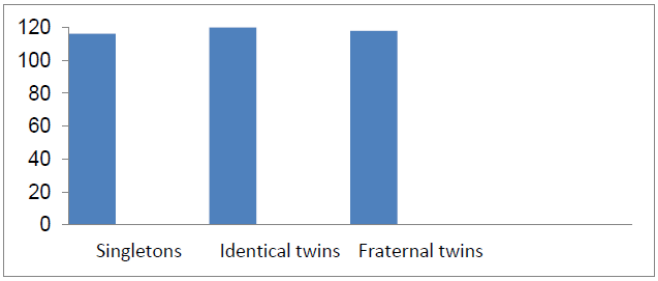
Graph III. The comparison of the grades of the participants of the three groups (singletons, identical twins and fraternal twins).

D. Semantic Quotient

The statistical points are related to the semantic quotient are shown in table Five. According to the table Five and Graph 4, indicated that no significant differences between three groups of participants (singletons, 116.17; identical twins, 119.89; and fraternal twins 117.88). The level of meaningful difference is at 0.536

TABLE V.
THE COMPARISON OF THE GRADES OF THE PARTICIPANTS OF THE THREE GROUPS. (SINGLETONS, IDENTICAL TWINS AND FRATERNAL TWINS)

Subtest	Participants	number	Mean	Standard deviation	Standard error	Minimum	Maximum	P-Value	Result
Semantic Quotient	Singletones	41	116.17	18.27	2.85	46	148	0.536	no meaningful
	Identical twins	28	119.89	9.24	1.74	98	134		
	Fraternal twins	40	117.88	9.98	1.57	46	136		
	total	109	117.75	13.53	1.29	46	148		



Graph IV. The comparison of the grades of the participants of the three groups (singletons, identical twins and fraternal twins).

IV. Conclusion

The purpose of the present study was to investigate semantic skill in the development of the language acquisition of Persian-speaking identical twins and compare them with fraternal twins and singletons. According to the findings of this study, at the level of subtest which was done in three groups of participants is shown that within the picture vocabularies identical twins had been an improved performance than two other groups. In other subtest, the performance of three groups of participant was not a significant difference. Semantic quotient in the three groups of participants was not significantly different. It seems all subjects during this test were similar grade, that is shown that two groups of twins (identical and fraternal) square measure adequate the singletons. Although fraternal twins are at a bit risk of language delay within the level of the subtests, but they have not a great risk in the semantic skill. However, it seems that identical twin children are not at great risk of language development delay in semantic skill.

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