



THE ROLE OF SIMULTANEOUS AND SUCCESSIVE ACQUISITION OF SECOND LANGUAGE ON READING, SPELLING AND MATHEMATICS DIFFICULTIES OF ELEMENTARY STUDENTS
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ABSTRACT

The aim of this study was to examine the role of simultaneous and successive acquisition of second language on learning difficulties of elementary students. A total of 180 students with reading, spelling and mathematics learning difficulties were selected after administrating the screening test. Cattell intelligence scale, reading disorder recognition test, spelling disorder test and mathematics disorder recognition test were administered. The results indicated that reading and spelling difficulties were more to surface in bilingual students with successive acquisition condition than bilingual students with simultaneous condition. There was no significant difference between groups in math difficulties. The results also indicated that there was significant interaction between gender and type of language acquisition and spelling difficulties, but, there was no significant interaction between gender and type of language acquisition and reading difficulties; similarly also, there was no significant interaction between gender and type of language acquisition and mathematics difficulties. The findings of the study have implications for parents, teachers and researchers about the role of language acquisition in students' reading, spelling and mathematics learning difficulties.

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INTRODUCTION

Bilingualism its basic principle is defined as the use of two languages for communication (Francies, 1999). According to evidence, bilingualism is found in almost all parts of the world, and therefore, potentially, in all languages. Based on Grosjean studies (1982), around half of the world's population are bilingual (Grosjean, 1982).

There are two types of bilingualism: 1) Acquisition of two languages simultaneously in early childhood (simultaneous acquisition), and 2) Learning the second language having already mastered the first language (successive acquisition). Children with bilingual parents who learn two languages simultaneously do not experience any problem in language development. A child who tries to acquire a second language after having acquired a first one needs about 3-5 years for being fluent like a native speaker (Ramirez, *et al*, (Laura E Berk.2001). There is considerable difference of opinion among linguists concerning the advantages of these two different types of language acquisition (simultaneous and successive acquisition). Some linguists believe that simultaneous cognitive organization of two languages in the child's brain diminishes abilities and capacities in second language acquisition (Dopke, 1996). However, some other studies (Cole & Cole, 1993; Curtis, 1977; Goldin &

Meadow, 1982; Lindfors, 1991; McLaughlin, 1984; Newport, 1991) showed that children of 2-6 years old who acquire two languages simultaneously are more competent than children who learn the second language in school.

The existence of different languages in some countries including Iran leads to many difficulties in the formal education of bilingual children, especially in the beginning of primary school, where these difficulties can cause psychological problems not just for the students and children themselves but also potentially for other parties involved, like parents. Furthermore, the situation incurs at times certain unbidden costs for families.

As shown in Bastian *et al* (1981), Rovandian children who speak their native language at home but French as a formal language in school evidence significant retardations in using prolonged and complex sentences, adverbs and adjectives and main and dependent clauses (Michaeli mani, 2006). Similarly, Genesee & Nicoladis (2006) showed that children who learn two languages successively experience more challenges in language development compared with those who learn the two languages simultaneously. The findings suggest that simultaneous acquisition of two languages leads to different developmental models in comparison with the successive course of events (Genesee & Nicoladis, 2005).

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Amery and Asare (2010) conducted a research that compared language learning problems among Turkish and Arab children who were studying Persian as a formal school language. The findings indicated that bilingual children had more perceptual – auditory difficulties, particularly in the first two months of formal education, with a descending trend. These children had reading and writing problems as well. Woolfolk (2001), in a research about learning disorder, showed that children who start acquiring a second language at school experience more difficulties in areas of reading and writing compared with monolingual children.

However, Nakayama & Buteerworth (1999) argues differently, showing that bilingualism isn't the cause of learning disorder. Regarding the prevalence of Learning disorders in our society, their related consequences and financial costs for families and educational system examining the etiological factors would be crucial for preventive goals considering the existence of bilingualism in our country and its impact on academic learning, the purpose of this study was to investigate the role of two language acquisition conditions(simultaneous and successive acquisition conditions) on elementary students learning difficulties(reading, spelling and math difficulties). The study is important in identifying bilingual students who are at risk for learning difficulties.

Statistical Population and Sampling Procedure

The population of the study consisted of all students attending second and third grade primary schools during the academic year. Bilingual students (male and females) with simultaneous and successive acquisition conditions were selected, and screening learning disorders test was conducted.

A total of 180 students (90 with successive and 90 with simultaneous acquisition condition) were selected as a final sample. Diagram (1) shows different groups of the study and the sample size of 180 total bilingual LD children with successive and simultaneous acquisition condition.

items in four separate sections:

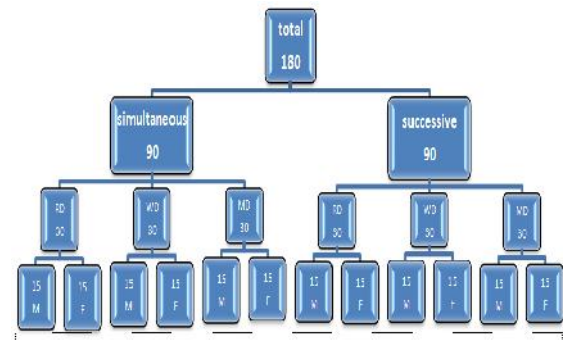


Diagram1 Flow diagram of the study design

Section (1) included general issues such as academic achievement, IQ, achievement discrepancies , academic skills discrepancies, and a differential criterion for specific learning disorder and other effective factors in academic failure (such as auditory and visual difficulties).

Section (2) includes writing skills such as sentence writing, spelling, and written expression.

Section (3) consisted of two domains, i.e. decoding and comprehension.

Section (4) is related to mathematics.

Content validity was studied by specialists. Test – retest reliability after 3 months was obtained at 73% (Bahari, 1388).

Reading Diagnostic Test (RDT)

Reading diagnosis test was prepared and standardized by Bahari& Hoseininasab (2007). This test was prepared for 1-4 grade elementary students. The test has four subscales. Differential validity of the test was examined by comparing dyslexic and normal children, which revealed relationships between not only subscales and school scores, but between subscales and each other as well. Concurrent validity was also studied by comparing these results with Mccallum and Bell (2001) dyslexia Diagnostic test findings.

Table 1 T test results for students in reading difficulties

		N	mean	Leven		T	DF	SIG
				SIG	F			
Reading difficulties	Simultaneous acquisition	30	183/145	094/0	906/2	108/4	58	000/0
	Successive acquisition	30	933/119					

Table 2 T test results for students in Spelling difficulties

		N	mean	Leven		t	df	Sig
				Sig	F			
Spelling difficulties	Simultaneous acquisition	30	67/17	59/0	717/3	445/2-	58	018/0
	Successive acquisition	30	17/23					

Table 3 T test results for students in Mathematics difficulties

		N	mean	LEVEN		T	DF	SIG
				SIG	F			
Mathematic difficulties	Simultaneous acquisition	30	57/41	234/0	444/1	310/0-	58	758/0
	Successive acquisition	30	70/42					

The research design was an Ex-post–facto and causal–comparative one.

Instruments

Checklist for screening specific learning difficulties (Bahari, 1388) was administered. The test consisted of 55

Key – math diagnostic test

Key – math diagnostic test has been standardized by Mohamuad Esmail. Three general domains were assessed by Key – math test through 13 subtests as followed:

- The scope of the basic concepts Included subtests of counting, rational numbers and geometry.

- Field operations include addition, subtraction, multiplication, division and mental calculation
- The scope of application is formed of five subtests that measure, time and money, estimation, interpretation and problem solving.

Validity was estimated using Cronbach's alpha, it is of five basic between 84% - 80%.

Spelling error analysis

Spelling errors including omission of letters / words, displacement of letters / words, adding letters / words, replace of homonymous Letters / word, combining words , Irregular word errors were recorded. Students' spellings were analyzed for the identification of writing difficulties.

RESULTS

As table 1 shows, there is significant difference in reading problems between two groups ($t= 4/108, p<0/01$). This shows the type of language acquisition may have an important role in reading problems.

Also, there are significant differences in spelling problems between two groups ($t= -2/455 P<0/05$), (table 2), but the comparison of math didn't bring out significant differences ($t= -0/310, p>0/05$). (table3).

Table (6) indicates there is no interaction among gender, type of language acquisition and mathematic problems, ($F= 0/269., P>0/05$).

DISCUSSION

The present study compared learning difficulties (in reading, spelling and math) in children with simultaneous and successive acquisition conditions.

One of the results of the present study was that the students with successive language acquisition have more problems in reading in comparison with the simultaneous acquisition group. This finding is congruent with Ameri and Assare (2010), Genesee and Nicoladis (2006), Wolfolk (2001), and Bustian (1981). Another finding was that students with successive acquisition showed more problems in spelling than the comparison group did. In other words, children who acquired Persian as a second language showed more spelling errors compared with children who learn two languages (Turkish and Persian) at the same time. This finding is similarly congruent with Assareh (2010), Ginesee and Nicoladis (2006), Wolfolk (2001) and Bustian (1981).

In the light of the fact that the acquisition of a second language is a complex and time-consuming process,

Table 4 Univariate analysis of variance for reading difficulties in two language conditions

	N	SS	DF	MS	F	SIG
Sex	60	526/489	1	526/489	085/0	361/0
Type of language acquisition	60	259/9235	1	259/9235	029/16	000/0
Interaction sex & language	-	116/109	1	116/109	189/0	665/0
Error	-	467/32264	56	-	-	-
Total	-	250/1096729	60	-	-	-

Table 5 Univariate analysis of variance for spelling difficulties in two language conditions

	N	Ss	Df	Ms	F	Sig
Sex	60	268/195	1	268/195	798/2	100/0
Type of language acquisition	60	201/492	1	201/492	053/7	010/0
Interaction sex & language	-	619/197	1	619/197	265/4	044/0
Error	-	946/3907	56	-	-	-
Total	-	000/29865	60	-	-	-

Table 4 indicates that there is no interaction among gender, reading problems and type of language acquisition, ($F= 0/189, P>0/05$), but table 5 indicates that there is significant interaction among gender, spelling problems and type of language acquisition, ($F=4/265, P<0.05$)

children need 3 to 5 years to achieve fluency in the second language, one similar to that of monolingual native peers. In the same vein, they must be skillful enough in the second language before reaping the benefits bilingualism could offer. It is in keeping with these facts that children with successive acquisition condition have more problems in the domains of reading and spelling. With regard to the fact that reading involves decoding processes and writing needs encoding, both of these skills require an appropriate level of verbal language acquisition.

Another interesting finding of the study is related to the interaction of gender and language in spelling problems. Boys had more problems than girls in the simultaneous acquisition group. Such findings may be interpreted by attending to the higher linguistic potential of girls. Thus, girls would be expected to prove more able to acquire two languages simultaneously. In comparing boys with boys and girls with girls, variability among the girls was obviously more than among the boys in terms of the two conditions of language acquisition (successive and simultaneous groups). Also, the severity of spelling problems was high in boys in both language acquisition conditions but only in successive acquisition condition in girls, i.e. spelling problems prove to be low in girls with

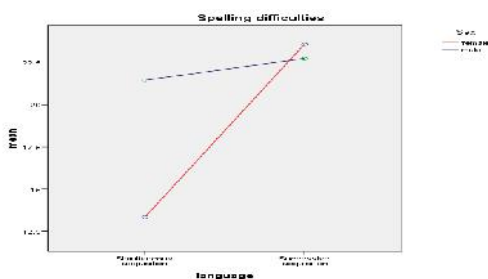


Diagram2 Gender differences between two groups

Diagram (2) shows gender differences between two groups. As shown in the diagram, in simultaneous groups, spelling problems are to be more found among boys than girls. Also, a comparison of simultaneous and successive conditions among girls illustrates more spelling problems in the successive group.

Table 6 univariate analysis of variance for math difficulties in two language conditions

	N	Ss	Df	Ms	F	Sig
Sex	60	800/55	1	800/55	271/0	605/0
Type of language acquisition	60	067/15	1	067/15	073/0	788/0
Interaction sex & language	-	286/55	1	286/55	269/0	606/0
Error	-	580/11520	56	-	-	-
Total	-	000/118164	60	-	-	-

simultaneous acquisition condition. This may also be explained by reference to the generally higher prevalence of learning difficulties among boys.

In the area of mathematics, there was no significant difference between two language acquisition groups. This finding is consistent with Nakayama and Butterworth 1999. This can be interpreted by the fact that the interaction or interdependency between math ability and the child's first language (mother tongue) is much lower than in the case of reading and spelling skills.

Some limitation of the study should be considered. The languages studied in this study was Persian and Azerbaijan Turkish languages. The finding could not be generalized to other bilingual students.

Another limitation was that elementary students were examined in this study and generalization of the findings for other students should be with caution. Additionally, some students in successive acquisition condition had limited prior experience of second language; these students were included in the final sample because of difficulties related to finding pure monolinguals.

The findings of this study has some implications for the future research, because of the importance of language acquisition conditions of students learning difficulties, we recommend to repeat the study for other languages.

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