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The Relationship between Multiple Intelligences and Performance on Grammar Tests: Focusing on Linguistic Intelligence

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ABSTRACT

The present study attempted to pinpoint the relationship between each of the intelligence types and performances on grammar tests, and to find what type of intelligences correlate to better performance on different forms of grammar test. To this end, 50 Iranian junior male and female students, within 23 to 28 of age span majoring in English language participated in this study. Three different forms of grammar test and a Multiple Intelligence (MI) questionnaire were administered in order to elicit the participants' responses. Descriptive and inferential statistics were used to analyze data. According to the results, there was a significant correlation between "Multiple Choice" test results and "Linguistic" and "Spatial" subtest of the Multiple Intelligence test and "Natural" subtest of the MI test. There was also a significant correlation between "Error recognition" test results and 'Linguistic" and "Logical-Mathematical" subtest of the MI test. Moreover, the results revealed a significant correlation between "item completion" test results and "Logical-Mathematical" and "Spatial" subtest of the MI test. Based on the results obtained, it could be argued that Linguistic subtest would be the best predictor, followed by Logical-Mathematical subset as the second important one.
KEY WORDS: Multiple Intelligences, Linguistic Intelligences, Grammar, Test Performance

1. INTRODUCTION

Multiple intelligences (MI) Theory is an amazing approach toward learning. The first scientist who proposed this idea was Gardner who suggested that "the traditional notion of intelligence as measured by IQ testing is far too limited and there are not just two ways to be intelligent, but many ways" (1983, p. 51). Based on Gardner's theory people vary according to their different aspects of their intelligence, so it would be better to know that one of the influential factors in second or foreign language learning is personal differences. One issue which makes people different from each other is related to their intelligence preferences (Ehrman, 2003). Additionally, not many studies have been conducted to investigate the relationship between intelligence preferences and language learning and the few studies which dealt with intelligence were concerned with intelligence as a unitary concept which is measured by Intelligence Quotient (IQ) tests (Ehrman, 2003). Thus, surely, there exists a gap in testing the relationship between MI and performance on grammar tests.

Accordingly, this research tries to find the differences between students' performance and the intelligence preferences.

What type of multiple intelligences correlate to better performance on different forms of grammar test?

Furthermore, if MI is playing a role in general, what type of intelligence correlates to better performance on different forms of grammar tests? It has to be highlighted that the experimental work of this study had been done by the same authors previously.

In the following section there would be a discussion of some issues related to the multiple intelligence as well as relevant theories and principles. After that, the concept of grammar and its teaching method with a focus on verbal-linguistic intelligence are presented. Next, a review of studies regarding the relationship between the multiple intelligence and teaching grammar is provided. Finally the authors suggest some implications.

2. Theoretical background

According to Boake (2002), the child's intelligence is determined in terms of the intellectual level (later, mental age), and is defined as the highest age level at which the child completed most tests successfully.

According to Neisser (1995), Intelligence has been defined in many different ways including, but not limited to, abstract thought, understanding, self-awareness, communication, reasoning, learning, having emotional knowledge, retaining, planning, and problem solving.

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Intelligence is, based on Gottfredson (1977), a very general mental capability that, among other things, involves the ability to reason, plan, solve problems, think abstractly, comprehend complex ideas, learn quickly and learn from experience. It is not merely book learning, a narrow academic skill, or test-taking smarts. Rather, it reflects a broader and deeper capability for comprehending our surroundings.

2.1. Multiple Intelligence

Gardner first defined seven different types of intelligence and then introduced "naturalistic intelligence" as the eighth type. Regarded as the ninth intelligence type, "existential intelligence" is still under discussion and investigation (Gardner, 2004).

The theory has been widely criticized in the psychology and educational theory communities. The most common criticisms argue that Gardner's theory is based on his own intuition rather than empirical data and that the intelligences are just other names for talents or personality types.

Table 1: Gardner's categories of intelligence (Gardner, 2004)

Intelligence	Definition	People who exhibit this intelligence
linguistic	sensitivity to the meaning and order of words	Winston Churchill, Doris Kearns Goodwin,
logical-mathematical	the ability to handle chains of reasoning and to recognize patterns and order	Bill Gates, Stephen Hawking, Benjamin Banneker
musical	sensitivity to pitch, melody, rhythm and tone	Ray Charles, Harry Connick
bodily-kinesthetic	the ability to use the body skillfully and handle objects adroitly	Mia Hamm, Michael Jordan, Michelle Kwan
spatial	the ability to perceive the world accurately and to recreate or transform aspects of that world	Mary Engelbreit, Maya Lin, Frank Lloyd Wright
naturalist	the ability to recognize and classify the numerous species	Charles Darwin, Jane Goodall,
interpersonal	the ability to understand people and relationships	Colin Powell, Martin Luther King Jr., Deborah Tannen
intrapersonal	access to one's emotional life as a means to understand oneself and others	Anne Frank, Bill Moyers, Eleanor Roosevelt

2.2. History of Intelligence Tests

According to Binet (1916), intelligence changes (develops) with age and in this reason his first intelligence test was based on the central idea that the age at which the 'average child' can succeed at a particular problem is an indication of the difficulty of that problem. Using this criterion, Binet (1916) and his colleagues developed their first intelligence test in which children could be characterized as average, advanced or delayed in their rate of development compared to their peers. The test included around 30 items of raising difficulty, starting with simple items that even children with intellectual disabilities were able to complete (such as following a lighted match with your eyes and shaking hands with the examiner). Binet was also the foremost psychologist to define that such tests must be:

a) given and scored in a measured and standardized manner if comparisons between children's performance are to be effectual and reliable;
b) offered in the same order to all children and in order of raising difficulty so that each child can pass as many tests as he/she can;
c) given in a one-to-one setting and only where the examiner has foremost established a friendly understanding with the child.

Psychologists still adhere to these very important principles of testing today.

2.3. Previous studies

Botelho (2003) investigated the application of MI theory in English language teaching and suggested that most teachers know MI theory and apply it in educational contexts, and many of them show their interest in knowing more about the theory to improve their teaching. Fonseca and Arnold's (2004) research is a study in favor of the application of MI theory in foreign language classrooms. Based on this study, MI-based activities may be considered as significant stimuli. Indeed, it is suggested that through implementing the tasks associated with MIs, motivating learners in second language classrooms may be more feasible. Furthermore, attention should be paid to applying a combination of MIs in educational contexts to meet all learners' needs.

Okebukola and Owolabi (2009) explored the effects of MIs on students' reading ability and concluded that MIs methods improve students' reading skill. In another study, Eng and Mustapha (2010) investigated the extent to which MI-based strategies and instructions improve students' writing ability. Findings revealed a significant improvement in students' overall writing ability in experimental group after two months of training. Gender has always been controversial in studies pertaining to MIs. Teele's (2000) Inventory of Multiple Intelligences (TIMI)

investigated the relationship between intellectual preferences and reading achievement. The upshots showed that the instrument does not provide consistent measurement and needs further development and refinement (2004) although a relationship was found between reading comprehension and logical-mathematical intelligence.

Researchers in some studies have investigated the relationship between gender and MI of specific learners aiming at finding out whether or not there were any gender differences in students' intelligence profiles in relation to their gender. Loori (2005) carried on a study of 90 English language learners and found that males showed higher preference in logical/mathematical intelligence. On the other hand, Razmjoo (2008) found that the use of intrapersonal intelligence by females was higher than that of the males whereas no significant difference was found between male and female participants regarding language success and types of intelligences. Hence, contrasts exist between the results of these two studies which studied the relationship with gender and MI.

2.4. Statement of the Problem

The role of individuals, intelligence preferences may have been investigated but it can be suggested that MI can have a role in different aspects of language proficiency and communicative competence. In this research, the researchers intend to pinpoint the relationship between MI and performance on grammar tests, and find that which type of intelligences correlate to better performance on different forms of grammar test.

This research tries to investigate the relationship between these proposed variables and whether there is a perceptible significance between the students, performance with different intelligence preferences. It is also hoped that the findings of this study would provide the practitioners in the field of EFL with some guidelines for more effective methods for authentic testing.

2.5. Research Question and Hypothesis

RQ: What type of multiple intelligences correlate to better performance on different forms of grammar test?

H0: No types of multiple intelligences correlate to a better performance on different methods of grammar tests.

3. METHODOLOGY

3.1. Participants

In this research, there were 50 junior students, male and female within 23 to 28 years old, all of them were majored in English language and have been studying English for three years. An instruction session was held in order to train the students about the process, the three different grammar tests; moreover, the MI questionnaire was distributed among participants in order to receive the students' replies.

3.2. Instruments

In order to do this research, some instruments were used. The instruments used in this study consisted of a standard grammar test and a Multiple Intelligences questionnaire. The grammar test consisted of different sections including multiple choice and completion tests. The scores were then used to be correlated with the scores of the questionnaire administration.

The type of multiple intelligences questionnaire which was given to the participants was called Multiple Intelligence Development Assessment Scale (MIDAS). This questionnaire was developed by Shearer (1996) to provide an objective measure of multiple intelligences. This is an acceptable questionnaire, since its validity and reliability have been shown and approved within the repeated use of it by many researchers.

3.3. Procedures

In order to do this research, the multiple intelligence questionnaire and grammar tests were utilized to collect the data. Multiple Intelligences questionnaire was the first to be administered which was composed of 8 different Multiple Intelligences questionnaire by Shearer (1996). It was given to the participants. One week after the collection of Multiple Intelligence Development Assessment Scale (MIDAS) questionnaire, the tests of grammar were administered in three sessions. The objective of the conducted test was to figure out whether there existed any relation between the grammar tests and the 8 different Multiple Intelligences questionnaire or not. The participants were provided with complete instruction and one example on how to take the tests.

4. RESULTS

This section presents the analytic results including the relationship between variables. This study attempted to provide answer to the following research question:

RQ: What type of multiple intelligences correlate to better performance on different forms of grammar test?

In this part of the study, eight groups of results related to the total marks gained by participants will be shown. The eight subtests' correlations with three different grammar tests are shown below (multiple choice, error recognition, and completion items). Table 2 is for answering the research question of this study showing that from eight categories of multiple intelligences, linguistic subtest contributes to a better performance on different grammar test forms and will be the best predictor after which logical-mathematical is important. The third one is the interpersonal and the fourth one is the spatial.

Table 2: Ranking for Finding the Most Effective Relationship

	Multiple choice	Rank	Error recognition	Rank	Completion items	Rank
LIN	-0.88**	1	-0.31*	3	-0.73**	**1**
L-M	-.18		-0.42*	2	-0.65**	**2**
SP	-0.45*	3	-.43**	1	-.36**	**4**
MUS	-.01		-.01		-.00	
B-K	-.25		-.13		.13	
INTER	.06		.15		-0.51*	**3**
INTRA	-.05		-.26		-.13	
NAT	-0.81**	2	-.09		-.14	

As mentioned above, linguistic subtest contributes to a better performance on different grammar test formats and will be the best predictor. Table 3 shows the results of the linguistic subtest of Multiple Intelligence test.

Table 3: Results of the Linguistic subtest of Multiple Intelligence Test

	frequency	percent	Valid percent	Cumulative percent
31	2	4	4	4
32	2	4	4	8
34	2	4	4	12
35	3	6	6	18
36	5	10	10	28
37	4	8	8	36
39	2	4	4	40
40	10	20	20	60
41	3	6	6	66
42	3	6	6	72
43	2	4	4	76
44	6	12	12	88
45	6	12	12	100
total	**50**	**100**	**100**	

According to Table 3 above, among 50 students who passed the Linguistic subtest, 6 of them (12%), have gained 45 as the highest mark and 2 of them (4%) have gained 31, as the lowest mark in this test.

Table 4 shows the correlation between "Multiple choice" test results and eight subsection tests of "multiple intelligence".

Table 4: Correlation between "multiple choice" test results and 'linguistic" subtest of the MI test

		Multiple choice	Linguistic
Multiple choice	Pearson Correlation	1	-0.88**
	Sig. (2-tailed)		.005
	N	50	50
Linguistic	Pearson Correlation	-0.88**	1
	Sig. (2-tailed)	.005	
	N	50	50

According to Table 4 above, there is a significant correlation (sig = .005 <.05) between "Multiple choice" test results and 'linguistic" subtest of the MI test. Table 5 shows the correlation between "Error recognition" test results and eight subsection tests of "multiple intelligence".

Table 5: Correlation between "error recognition" test results and 'linguistic" subtest of the MI test

		Error Recognition	Linguistic
Error Recognition	Pearson Correlation	1	-0.31**
	Sig. (2-tailed)		.008
	N	50	50
Linguistic	Pearson Correlation	-0.31**	1
	Sig. (2-tailed)	.008	
	N	50	50

According to table 5 above, there is a significant correlation (sig = .008 <.05) between "Error recognition" test results and 'linguistic" subtest of the MI test. Table 6 shows the correlation between "item completion" test results and eight subsection tests of "multiple intelligence".

Table 6: Correlation between "item completion" test results and 'linguistic" subtest of the MI test

		completion item	Linguistic
completion item	Pearson Correlation	1	-0.73
	Sig. (2-tailed)		.396
	N	50	50
Linguistic	Pearson Correlation	-0.73	1
	Sig. (2-tailed)	.396	
	N	50	50

According to Table 6, there is not any significant correlation (sig = .396 >.05) between "item completion" test results and 'linguistic" subtest of the MI test.

5. DISCUSSIONS AND CONCLUSIONS

The results of this study show that the highest marks for multiple choice test of grammar were gained by 4% students in multiple choice test and the lowest marks were gained by 6% of students in this test. For another grammar test titled as "Error recognition", 8% the highest mark 12% have gained the lowest mark in this test. These results showed that the difference between the highest and the lowest marks in multiple choices test is more than that among the highest and the lowest marks in "error correction" test. For the third grammar test, "completion items" in this study 4%, have gained the highest mark and 6% have gained the lowest mark in this test. These results show that the difference between the highest and the lowest marks in multiple choices test is more than that among the highest and the lowest marks in "error correction" test and also higher than that among the highest and the lowest marks in "completion items" test.

Among those who passed the Linguistic subtest, 12% have gained the highest mark and 4% have gained the lowest mark in this test. For the second group of MI test, titled as Logical-mathematical subtest, the following results are found among those students who passed the Logical-mathematical subtest; 6% have gained the highest mark and 4% have gained the lowest mark in this test. For the third group of MI test, titled as spatial subtest, 6% have gained the highest mark and 4% have gained the lowest mark in this test. For Musical subtest, 4% have gained the highest mark and 4% have gained 22, as the lowest mark in this test. For Bodily –kinesthetic subtest, 6% have gained the highest mark and 6% have gained the lowest mark in this test .The lowest mark in Bodily –kinesthetic subtest, was much lower than the lowest mark of other tests such as Musical subtest, Spatial subtest, Logical-mathematical subtest, and Linguistic subtest. For interpersonal sub test, 4% have gained the highest mark 4% have gained the lowest mark in this test.

In sum, findings of the results proved to be in line with previous studies seeking the correlation between MI and grammar (Nolen, 2003; Eng & Mustapha, 2010; Saricaoglu & Arikan, 2009). Moreover, the authors of the present study conclude that linguistic subtest would be the best predictor of learners' ability on grammar tests.

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