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The Relationship between Multiple Intelligences and Reading Proficiency of Iranian EFL Students

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Abstract: The purpose of this study was to examine the relationship between multiple intelligences (MI) and reading proficiency of Iranian EFL pre-university students and to look into the role that gender plays. To find out the relationships among the naturally occurring variables, the researcher employed a descriptive and ex post facto design. The participants were 128 randomly selected pre-university students. The researcher utilized three instruments, namely: 1) a demographic questionnaire; 2) the Persian version of Mckenzie's MI Inventory; and 3) a standardized reading proficiency test retrieved from paper-based TOEFL® tests. Analyzing the data using *t*-test, it was found that there was a statistically significant difference in the mean of musical-rhythmic intelligence scores of the low achievers and the high achievers which was positive and stronger among the low achievers. Accordingly, it seems that the high achievers may have lower musical intelligence, which also indicates that better readers may be less intelligent 'musically'. A statistically significant difference was also found between the mean bodily-kinesthetic intelligence scores of the two genders which was positive and stronger among the females. No significant difference was found between the male and female students in their reading proficiency scores.

Key words: Multiple intelligences theory % McKenzie's MI Inventory % Reading proficiency % EFL pre-university students

INTRODUCTION

General intelligence 'g' or general factor which was formerly understood to be fixed at birth was dominated for many years by the term "IQ" or Intelligence Quotient referring to those having a high or low IQ. After the Second World War, attempts were made to improve the scales used in measuring the general intelligence that was operationally defined as the ability to answer questions on an IQ test. Such definition has left some questions unanswered especially in school settings. Accordingly, Gardner's multiple intelligences (MI) theory (1983) is a useful alternative with the ability of addressing individual needs.

Through the MI theory, Gardner posits that each individual has varying levels of intelligence and thus has a unique cognitive profile. He also states that the intelligences are quite independent of each other. Accordingly, he states that everyone has the capability and capacity to develop all the nine intelligences to a reasonably high level of performance. Gardner [1] posits that intelligences can be educated or developed through schooling and learning and they need to be nurtured with appropriate encouragement, enrichment and instruction.

Gardner [2] disagrees with previous models of intelligence as they put maximal value on verbal-linguistic and logical-mathematical intelligences and ignore other abilities. Gardner views intelligence as "the capacity to solve problems or to fashion products that are valued in one or more cultural settings" [3]. Propounding the theory of MI, he formulated a list of seven intelligences in 1983. Later, he added two more to the list. The nine intelligences are verbal-linguistic; musical-rhythmic; logical-mathematical; visual-spatial; bodily-kinesthetic; interpersonal; intrapersonal; naturalist and existential which are briefly explained below.

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Verbal-linguistic Intelligence: This intelligence is defined by Gardner [1] as sensitivity to the spoken and written language and using the language to achieve goals. Gardner [1] and Chapman and Freeman [4] also claim that the people who are strong in verbal-linguistic intelligence usually have a good vocabulary potential which allows them to read books and to be absorbed in the books and perform well in English classes.

Logical-Mathematical Intelligence: According to Gardner [2], the people with strong logical-mathematical abilities have a keen sense about objects and order. Armstrong [5] says this intelligence is "the understanding and use of logical structures, including patterns and relationships and statements and propositions, through experimentation, quantification, conceptualization and classification" [5].

Visual-Spatial Intelligence: McKenzie [6] defines visual-spatial intelligence as the ability to learn visually and organize ideas spatially. For example, see concepts in action in order to understand them and also the ability to "see" things in one's mind in planning to create a product or solve a problem. Therefore, those with a high level of this intelligence have the ability to use shapes, colors, graphics and space and use their mental imagery in order to discern the space orientation.

Musical-Rhythmic Intelligence: This intelligence is considered by Lazear [7] as the knowing which occurs through hearing, sound, vibrational patterns, rhythm and tonal patterns, including the full range of potential sounds produced with the vocal chords. And the mode or tools to utilize this intelligence are through singing, musical instruments, environmental sounds, tonal associations and the rhythmic possibilities of life.

Bodily-Kinesthetic Intelligence: The people with such talent are sensitive to time and are skillful at using the whole body movement in a coordinated way and also good at manipulating objects by using their hands. Such people have control of the motions of their body and are able to handle objects in skillful ways. McKenzie [6] says this intelligence allows us to learn through interaction with one's environment and he states that it is not the realm of "overly active" learners and it promotes understanding through concrete experience.

Interpersonal Intelligence: Armstrong [5] considers this intelligence as the ability to notice and make distinctions among other individuals with respect to moods, temperaments, motivations, intentions and to use this information in pragmatic ways, such as to persuade, influence, manipulate, mediate, or counsel individuals or groups of individuals toward some purpose. It is also worthy to mention that this intelligence will result in cooperative collaboration and working with others.

Intrapersonal Intelligence: Such ability empowers the individuals to understand their feelings, panics and motives and is chiefly based on the individual's examination and knowledge of their own feelings. Weber [8] says this intelligence includes accurate self-knowledge, access to one's feelings and the ability to discriminate among them and the ability to draw on one's feelings to direct behavior.

Naturalist Intelligence: McKenzie says that this intelligence enables one to select subtle differences in meaning. Armstrong [5] defines this intelligence as "the capacity to recognize and classify the numerous species of flora and fauna in one's environment and the ability to care for, tame, or interact subtly with living creatures, or with whole ecosystems" [5]. Having such intelligence indicates our talent to differentiate among the living things (plants, animals, etc.) and also our sensitivity to the other features of the world like configuring the clouds and the rocks.

Existential Intelligence: By having such a talent which is the capacity to deal with deep questions, questions about the existence of human beings will come to mind like seeking the meaning of life, the reason of death and our role in the world [6, 9-12]. McKenzie [6] states that this intelligence allows us to see the "big picture": "Why are we here?" "What is my role in the world?" "What is my place in my family, school and community?"

Since cognitive abilities have also influence on reading comprehension, some scholars like Goodman [cited in 13] have related reading to thinking and believe that readers with normal cognitive abilities have different performances. Thus, understanding where effort should be made, may help learners in enhancing their experience towards the goal of higher proficiency and academic achievement. By raising their awareness of their preferred cognitive modality, the teacher can raise their interest in learning and helping them gain understanding of what method suits them best. In fact, the teacher can equip learners to tackle the challenges of different language learning skills such as reading skill.

Reading is a cognitive process centered in the brain, including the processes that the brain utilizes in mental activities (e.g. paying attention to something, forgetting an important call). It is a dynamic process that requires active, meaningful communication between the author and the reader. In other words, reading is an active process of constructing meaning from written text in relation to the experiences and knowledge of the reader. In fact, it is an essential component of academic learning that helps the reader to be a learned one in the broader community. Thus, failure to achieve sufficient proficiency in reading hinders student's access to the needed tools for further learning as mentioned by Koda and Zehler [17].

One of the major goals that the teachers usually try to achieve in the classroom is to instruct reading the printed text to the students in order to nurture their ability to interact with and to understand the printed language. According to Wiener and Bazerman [21], readers usually rely on many skills in the reading process which are the overlapping steps and techniques that help them understand the printed text. The reading process, therefore, involves the readers who are passive and active. Wiener and Bazerman [21] also state that college students are mostly passive readers who start reading with little thought ahead and expect the words and sentences to produce meaning by themselves."They usually do not try to build a partnership with the writer to understand what the writer says" [21]. Contrary to the passive readers are the active readers who are defined by Wiener and Bazerman [21] as "the ones who know that they have to work at getting meaning from a page. They take conscious steps to engage what they read. Accordingly, the writer and the reader together create meaning" [21].

Employing reading instruction also requires teachers' understanding of when and how to teach the dimensions of reading in a balanced way. According to Walker [22], a good teacher is one who does not forget that readers are active and constructive as they approach learning tasks. S/he strives to choose instructional techniques and materials that balance the instruction within the active reading framework. Thus, the teachers must help students use their strategies and combination of intelligences to learn whatever it is they want to learn, as well as what the teachers and society believe they have to learn. It is believed that the students who are "aware of their most productive mode of learning meet with greater success in both education and in the workforce than those people who attempt to learn and work through a mode with which they are incompatible" [Biggs 1988, Flavell, 1976; cited in 16]. Walker [22] also states that the focus of teachers should be mostly on what students can do to harmonize their strengths with suitable reading experiences.

The purpose of choosing pre-university students for this study was that they were hoping to pursue Higher Education; therefore, they must take a one-year pre-university course, at the end of which they may obtain a 'Pre-University Certificate'. Passing this one year course and achieving the Certificate is mandatory for a student to be qualified to sit for the highly competitive National Entrance Exam (Konkur), the success of which can result in one gaining a place at university. Thus, they are under enormous pressure and have to read a lot of subjects which are divided into two groups: general subjects (Arabic Language, English Language, Persian Language and Literature, Religion and Ethics) and specific subjects (Mathematics, Physics and Chemistry). In addition, there are various specialized courses for different educational branches. It should be mentioned that they have to read the books for the last three years of high school too. Different subjects require different ways of reading and thus need various sets of practices.

Moreover, in Iran, educational policies primarily put an emphasis on the reading skills of the students. Political and social reasons have resulted in Iranian EFL learners having little or no contact with native English speakers for the past two decades [23]. Thus, native speakers of English are rarely found teaching English as a second language in schools or universities in Iran. Therefore, students do not have many opportunities to use the language outside the classroom. In particular, a body of research [23-26, Golsorkhi, 2008 [cited in 27]] in Iranian EFL settings has shown that upper secondary and pre-university students are mostly supposed to learning English in preparation for the highly competitive National university Entrance Exam (Konkur).Consequently, the focus of teachers is merely on the reading skill and trying to improve this skill among the students at the expense of other skills (listening, writing and speaking).

Furthermore, some studies [see 28, 29] have reported that there is no significant difference between gender and MI while some researchers have reported different findings [see 30, 31-34]. Thus, in addition to determining the relationship of self-report MI profiles of pre-university students and their reading proficiency, the study would also investigate whether gender plays a role in this regard.

Aim of the Study: In this study, the researcher attempts to examine the relationship between multiple intelligences (MI) and reading proficiency, the dominant domains,

specific skills and predominant intellectual styles of Iranian pre-university students and to see whether gender is a significant variable in this regard. Thus, the study seeks to answer the following research questions:

- What are the intelligences used by Iranian EFL pre-university students with low/high reading proficiency?
- (a) Is there any significant difference between multiple intelligences and gender of Iranian
- EFL pre-university students?
- Is there any significant difference between the two genders in terms of their reading proficiency?

Methodology: A descriptive and ex post facto design was employed to accomplish the objectives of the study and to identify the relationships among the variables. Some researchers [35, 36] suggest an ex post facto design when natural categories have been influenced by existing variables.

Participants: The participants for this study were 128 male and female pre-university students (54 males, 74 females) in grade 12, studying in Tehran high schools in the academic year 2008-2009. They were chosen through cluster random sampling method.

Instrument: The instruments utilized in the present study are as follows: i) a demographic questionnaire; ii) the Persian version of McKenzie's (1999) MI Inventory, validated and modified for the Iranian context by Hajhashemi and Wong [37]. It consists of 90 Likert-type statements designed to assess the MI of students and includes the indicators of the nine intelligences proposed by Howard Gardner; and 3) a standardized reading proficiency test from retrieved paper-based TOEFL® tests. The test consisted of five short passages, each followed by 9 to 11 multiple-choice questions and 50 in total.

Data Collection Procedure: Data collection took place during the summer semester 2008-2009. At the initial phase, the researcher contacted the Tehran Education Organization for approval and the selection of schools to be covered. To ensure an unbiased data collection, the schools were selected randomly. Meetings with the principals of the selected schools were held in order to gain the permission for their students' participation. This completed the administrative procedure and a letter of consent was received. The process of data collection was then done in two sessions. In the first session, both the demographic and the MI questionnaires were administered and the students were asked to complete the questionnaires within 40 minutes. In the following week, the reading comprehension test was given to the students, which was completed in about 55 minutes. Once the questionnaires and the test were successfully responded to and handed back to the researcher, each of the participants as well as their teacher were given a present as a token of gratitude for their cooperation.

Exploratory Data Analysis (EDA): Prior to the application of parametric analysis, namely *t*-test, the dependent and independent variables were screened for normality and homogeneity assumptions. The data gathered from the MI Inventory as well as the TOEFL® reading test were subjected to normality distribution in order to identify the most suitable statistical analysis for the study. Pallant [38] calls the Exploratory Data Analysis (EDA) as an exploration of general assumptions' fulfillment prior to inferential analysis and to determine whether the EDA satisfies the required assumptions for parametric tests. The evaluation of general assumption on normality of the dependent and independent variables is one of the most common EDA explorations reported.

Initially the accuracy of data entry, missing data and outliers were checked according to the criteria suggested by Tabachnick and Fidell [39]. Descriptive statistics of all the variables were examined using SPSS normality. An examination of the values indicated no values out-of-range. The small number of missing data in some demographic variables would not create a problem in the interpretation of the results. Examination of the standardized residual plots in identifying potential outliers showed no cases above +3 or less than-3 as suggested by Tabachnick and Fidell [39]. Thus, no extreme scores were detected in both the dependent and independent variables in this study. In the second phase, tests of normality and homogeneity were carried out. The analyses (tests of normality and homogeneity) revealed that the data for the variables were normally distributed which further suggested that it has met the required assumptions for parametric tests.

RESULTS AND DISCUSSIONS

To answer the first research question, there was a need to divide the students into two groups namely, high achievers and low achievers. The respondents' language proficiency test (Table 1) revealed that out of the total of

Table 1: Descriptive statistics of TOEFL® Reading test

Test	Minimum	Maximum	Mean	*S.D.*
Reading	1.00	21.00	10.54	5.46

N=128

Table 2: Performance of Iranian EFL students in Different Proficiency Tests

Researcher (s)	No.	Proficiency test	Mean	*SD.*	*Min.*	*Max.*
Akbari and Hosseini [46]	90***	IELTS (excluding speaking section)	43.01	14.1	16	81
Akbari and Talebinezhad [41]	128***	Michigan proficiency test (100 multiple- choice proficiency test including vocabulary, structure and reading comprehension)	29.98	13.07	7	68
Hashemi [47]	122*	IELTS	24.34	5.22	---	---
Mahdavy [43]	151*	TOEFL (listening section)	16.54	4.30	10	27
	117*	IELTS (listening section)	16.58	6.43	5	35
Razmjoo [29]	278**	A 100-item researcher made proficiency test (including vocabulary, reading and structure)	43.81	13.39	15	83

No. = Number of participants; * English major university students at B.A. level.

** Different major Ph.D. candidates; *** English major university students at B.A. and M.A. levels.

50 marks, the range of the scores is from a minimum of 1 to a maximum of 21 which shows that all students managed to score less than half of the total mark. Such an observed poor performance as stated by Grabe [40] could be due to the difficulty faced by students in answering the standardized reading test, as academic texts are difficult. Thus, to arrive at some criteria about these types of readers, the grading system of some studies were reviewed [e.g., 41, 42]. The review showed that there is no rigid system among these studies regarding the division of the students into groups. For example, Akbari and Talebinezhad [41] did a study in which the participants (B.A. and M.A. students) were divided into three proficiency groups (elementary, intermediate and advance) based on the standard deviation of the scores obtained. In doing so, the researchers considered ±0.5 standard deviations and then the groups were specified as elementary (0.5 standard deviation below the mean), intermediate (scores falling in the range of ±0.5 standard deviations above and below the mean) and advanced (more than 0.5 standard deviation above the mean). In another study, Razmjoo *et al*. [42] divided the students based on the scores obtained from vocabulary levels tests. In this regard, the researcher decided to choose the students and group them based on the mean ±2.0 standard deviation.

Furthermore, the researcher reviewed the performance of Iranian EFL students in different proficiency tests (Table 2). Based on the information in Table 2, it can be concluded that students obtained scores under the mean in the studies. For example, in a study conducted by Mahdavy [43], the mean score of the students in listening part of IELTS was found to be *M*=16.58 (out of 40), *SD*=6.43 and for the TOEFL, it was found to be *M*=16.54 (out of 50), *SD*=4.30. Razmjoo [29] did a study among Ph.D. candidates (N= 278). The mean score of the students in a 100-item researcher-made proficiency test was found to be *M*=43.81 (out of 50), *SD*= 13.39.

Thus, low achievers and high achievers in this study were identified by their English Language proficiency based upon their performance in TOEFL® reading test. High achievers in the context of this study would mean learners who scored grades above the mean score (*M*=10.54) and the ones who scored below the mean were considered as low achievers.

An independent sample *t*-test was conducted between the two categories (high and low achievers). The results are shown in Table 3 in which group 1 stands for low achievers and group 2 stands for high achievers.

To find out whether there is a significant difference between the two groups (high and low achievers), the data for *p* values (two-tailed) were considered. According to Pallant [38], if the value for *p* is equal or less than. 05, there is a significant difference in the mean scores on the dependent variable for each of the two groups. If the value is above. 05, there is no significant difference between the two groups. In the data presented in Table 3, the *p* value (2-tailed) for musical-rhythmic intelligence is less than the required cut-off of. 05 (*p*=.002). Therefore, it can be concluded that there is a statistically significant

Table 3: Independent Samples *t*-test for MI of the Two Proficiency Groups

Intelligences	Groups	Mean	*t*	*p* (2-tailed)
Naturalist	1	40.15	1.07	.287
	2	39.24		
Musical-rhythmic	1	42.21	3.10	**.002**
	2	39.10		
Logical-mathematical	1	38.81	1.229	.221
	2	37.80		
Existential	1	40.37	-1.906	.059
	2	41.59		
Interpersonal	1	34.91	-.126	.900
	2	35.02		
Bodily-kinesthetic	1	39.63	1.579	.117
	2	38.21		
Verbal-linguistic	1	36.73	-.689	.492
	2	37.38		
Intrapersonal	1	42.55	.437	.663
	2	42.24		
Visual-spatial	1	39.86	.891	.375
	2	39.15		

Note: 1= low achievers (*N*=67), 2= high achievers (*N*=61)

Table 4: Guidelines provided by Cohen (1988)

Indicator	Eta value
Small effect	.01
Moderate effect	.06
Large effect	.14

difference [*t* (126) = 3.10, *p* (two-tailed) =.002] in the mean musical- rhythmic intelligence scores between the low achievers and the high achievers. Following Pallant [38], SPSS does not provide Eta squared values (Eta^2) for *t*-tests; thus the calculation procedure for the study was done manually. Eta squared was found to be. 07 (Eta^2 =.07). Interpreting the Eta value was then performed by employing the guidelines proposed by Cohen [44] (Table 4). The magnitude of the differences in the means was moderate (Eta^2=.07).

To address research question 2, that is to discover the differences between MI of the students and their gender, an independent samples *t*-test was conducted between MI categories and gender. The results are shown in Table 5.

To find out whether there is a significant difference between the two genders in terms of their intelligences, the data for *p* values (two-tailed) were considered. The data presented in Table 5 shows that only the *p* value for bodily-kinesthetic intelligence is less than the required cut-off of. 05 (*p*=.004). Following Pallant [38], it can be concluded that there is a statistically significant difference [*t* (126) = -2.95, *p* (two-tailed) =.004] in the mean bodily-kinesthetic intelligence score for males and females. The magnitude of the differences in the means was also found to be moderate (Eta^2=.064).

Table 5: Independent Samples *t*-test for MI of the two genders

Intelligences	Gender	Mean	*t*	*p* (2-tailed)
Naturalist	Male	39.18	-1.081	.282
	Female	40.11		
Musical-rhythmic	Male	40.78	.084	.933
	Female	40.69		
Logical-mathematical	Male	38.54	.436	.664
	Female	38.17		
Existential	Male	41.41	1.207	.230
	Female	40.62		
Interpersonal	Male	35.26	.610	.543
	Female	34.74		
Bodily-kinesthetic	Male	37.44	-2.951	**.004**
	Female	40.05		
Verbal-linguistic	Male	37.11	.131	.896
	Female	36.99		
Intrapersonal	Male	41.72	-1.687	.094
	Female	42.90		
Visual-spatial	Male	39.46	-.128	.898
	Female	39.57		

Note: N_{Males}=54, $N_{Females}$=74

Table 6: Independent Samples *t*-test for Reading proficiency scores of the two genders

Test	Gender	Mean	*t*	*p* (2-tailed)
Reading score	Male	10.50	-.069	.945
	Female	10.57		

Note: N_{Males}=54, $N_{Females}$=74

The present findings (as shown in Table 5) are contrary to the previous studies [28, 29] which have reported that there is no significant difference between gender and MI. However some researchers have reported different findings [30-34]. For example, in the study by Saricaoglu and Arikan [33], they found that there are no significant gender difference in the intelligence types of the students except their verbal-linguistic intelligence which was positive and stronger among the females. Another study by Pasha Sharifi [32], has reported the findings of a sample group of 120 high school students in different branches of study. He has observed that the girls are superior to boys with regard to intrapersonal intelligence, but the boys are superior to girls in their visual-spatial intelligence. He also reported that there was no significant difference between the two genders in other kinds of intelligence. Keskin and Yildirim [30] also conducted a study in which the data were collected from 180 university students of both genders (51 males, 129 females). The findings revealed that girls are stronger in using verbal-linguistic, visual-spatial and musical-rhythmic intelligences comparing to the boys.

Based on the findings for this research question (Table 5), further analysis (another independent samples *t*-test) was conducted to determine the difference in reading proficiency scores of Iranian EFL pre-university students based on their gender. The results are shown in Table 6.

In order to find out whether there is a significant difference between the two genders in terms of their reading proficiency, the data for *p* values (two-tailed) were considered. The data presented in Table 6 reveals that the *p* value is more than the required cut-off of. 05 (*p*=.945). Following Pallant [38], it can be concluded that there is no significant difference [*t* (126) = -.069, *p* (two-tailed) =.945] in the mean reading scores for males and females.

CONCLUSION

In this study, the focus was on examining the relationship between multiple intelligences and reading proficiency of Iranian pre-university students and to see if gender plays a role in this regard. The findings of the study have brought to light several implications of MI pertaining to the reading proficiency of Iranian EFL pre-university students. They revealed that low achievers have a higher musical-rhythmic intelligence, indicating that struggling readers may be more intelligent 'musically' than their more proficient counterparts. A recommendation for future research would be to conduct a much larger study in order to confirm these findings. Government policies for the advancement of the reading proficiency of the students should consider creating more opportunities for students with high musical intelligence to catch up with their low musical intelligent colleagues in reading proficiency since they may need additional support and the highest quality of instruction and materials at their instructional level. For instance, multiple programs such as appropriate materials, extra reading classes and remedial lessons should be provided for low achievers in order to meet their needs and improve their low reading proficiency. These suggestions, if properly implemented, may eliminate low achievers' skepticism toward learning and may improve their reading proficiency.

To the researcher's knowledge, this study is the first attempt to determine the relationship between MI and reading proficiency among Iranian EFL pre-university students. Although the theory of MI has received a great deal of interest worldwide, it still needs to be refined carefully as different findings reveal that the theory is not well established yet and needs more time and studies to be grounded.

The MI assessment questionnaire is also a limiting factor. Although care has been taken in collecting data, human qualities are so complex and profound that it is difficult to accurately measure by any standardized assessment instrument. Hence, the best assessments can obtain very limited and superficial information about the full potential of the students. The reality has shown that unless we express our good feelings, people often do not know they exist since people are not mind readers [Hersey, Blanchard and Johnson; cited in 45]. Similarly, some individuals tend to have a higher opinion of themselves in self-ratings than do others. Thus, in case of having a lack of knowledge or insight, they may tend to inflate their self assessment [45].

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