The Role of Multiple Intelligences (MI) in Listening Proficiency

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ABSTRACT

Not many studies have so far quantitatively investigated the role of Multiple Intelligences (MI) in language teaching and almost no research has explored the role of MI in listening proficiency. In this study, the role of MI was investigated by giving one hundred and fifty-one junior and senior English language students an actual TOEFL listening comprehension test and a Multiple Intelligences Development Assessment Scales (MIDAS) questionnaire. The results suggest that, although all the intelligences positively correlate with performance on TOEFL listening comprehension, only linguistic intelligence has a statistically significant but low correlation with TOEFL listening. Furthermore, the results of regression analysis indicate that linguistic intelligence is included as a predictor of listening proficiency while other intelligences are excluded. The results provide quantitative data that, except for linguistic intelligence that has a small role, other intelligences do not make any contribution to performance in listening proficiency and learners with different intelligences have equal chances and only those with low linguistic intelligence need more help.

INTRODUCTION

One of the areas of heated debate in education and foreign language teaching which has attracted so much interest in both fields is undoubtedly exploration of learners' individual differences which is hoped to lead to effectiveness of teaching for all learners. So many studies have so far focused on the role of cognitive, affective, and social factors which result in learners' differential learning and proposals have been made to tackle learners' problems by adjusting teaching to the learners' individual characteristics. From among these factors, intelligence has always been regarded as a source of variability in educational and workplace contexts. The history of intelligence testing shows that there were at least two reasons which caused widespread research on individuals' differential mental capacities. Binet's (1905) introduction of one of the first intelligence tests was a reaction to some students' failure to achieve the desired educational goals in France and the second reason dates back to World War I during which the US army had to select soldiers who would finally be assigned to suitable tasks according to their mental capabilities. As a result, not long after the emergence of definitions and tests of intelligence, schools were barring students who could not be regarded as intelligent enough and Spearman (1927) proposed that less intelligent individuals should not be allowed to have offspring. These movements, quite naturally, later made many psychologists and educationalists consider categorization and separation of individuals unfair and discriminatory. Moreover, later research revealed that intelligence is not a unitary construct and it must be multiple (Thurstone, 1938; Stenberg, 1958 as cited in Malim and Birch, 1998).

The theory of Multiple Intelligences (MI) which was proposed by Gardner (1983) is rooted in the idea that intelligence is fundamentally multi- faceted and has recently been widely acclaimed by language learning and teaching community and educationalists as a way to account for individual differences in the classroom context (e.g. Richards, 2001; Larsen-Freeman, 2000) and to optimize learning by suggesting that each learner is uniquely intelligent and therefore is predisposed to a particular mode of learning. However, application of MI in language education has barely started and there are still few aspects which have undergone extensive research. One of the unexplored areas in language learning and teaching is the degree to which L2 learners' listening performance is affected by MI. As it will be explained, each of the aspects of listening comprehension might be hypothesized to be connected to a particular intelligence and obviously no conclusion can be made unless the hypotheses are investigated through research.

Emergence of Intelligence Tests

Modern attempts to study individual differences were pioneered by the British scientist Galton in 1885. He tried to investigate the relationship between the intellectual ability and skills such as reaction time and sensitivity to physical stimuli. In 1904 Binet was commissioned by the French government to develop techniques to identity those primary school children who lacked the necessary capabilities for succeeding in normal classes and had to be provided with special education. A year later Binet and Simon produced the first intelligence quotient (IQ) test which contained 30 short tasks related to everyday problems of life and were arranged so as to be of increasing difficulty. After the translation of Binet-Simon scale into English and its administration in the US, it was found that the test had to be revised and the inherent shortcomings could be removed. Terman (1916) of Stanford University found that the Paris-developed age norms did not work well for Californian children and therefore by adding some items and modifying others developed the Stanford-Simon test and extended the age range to adulthood. Terman utilized Stern's (1912) formula to express the relation between an individual's mental age and chronological age. According to this formula the IQ of an individual is calculated by dividing an individual's mental age by his/her chronological age and multiplying it by 100. With the outbreak of World War I Yerkes (1915) and his team of experts including Terman who were appointed by the US army developed the Army Alpha and Beta tests, the latter being a version of Alpha which could be used with non-English speaking or illiterate individuals. Spearman (1927) analyzed the intelligence test data collected mainly for pragmatic purposes prior to his investigation and by doing factor analysis opted for a two-factor theory of intelligence: general and special abilities. However, he was excessively enthusiastic about the general (g) factor and suggested that only individuals with a satisfactory level of general intelligence should be allowed to vote or have offspring. Thurstone (1938) accepted Spearman's proposal but disputed its importance by arguing that g is in fact a second order factor which is obtained as a result of combining the first-order factors which are related to one another. His identification of 7 types of intelligence which he called "primary mental capabilities" is regarded as the first multi-factor approach to intelligence. Guilford (1967) suggested that there are at least 180 elementary abilities which are made up of three dimensions: operations,

contents, and products. Stenberg (1985, 1988 as cited in Malim and Birch, 1998) defined intelligence as the mental capacity to automatize information processing and to emit contextually appropriate behavior in response to novelty. He proposed a Triachic theory of intelligence which is made up of three sub-theories: componential, contextual, and experimental sub-theories.

The historical development of intelligence theories is indicative of the fact that IQ tests provide an incomplete picture of individual differences in terms of mental capabilities and the more recent ideas which emphasize the multidimensional nature of intelligence have been supported. From among these ideas, perhaps the theory of Multiple Intelligences has been most influential and its application in education has also been one of the most controversial topics.

Multiple Intelligences

According to Gardner (1999a) intelligence is the ability to solve problems, or to create products that are valued within one or more cultural settings. Gardner (1993) noted the traditional IQ tests unfairly measured only logic and language and disregarded other intelligences of the brain. He also added that all humans have these intelligences, but people differ in the strengths and combinations of intelligences. Furthermore, he believed that all of the intelligences could be enhanced through training and practice. At first Gardner introduced 7 intelligences but after a few years added the 8th to the list:

1. **Musical intelligence** is the ability to perceive, transform, and discriminate between musical forms and includes sensitivity to rhythm, pitch and timber.

2. **Bodily-kinesthetic intelligence** is the ability to solve problems or form products using all or part of one's body.

3. **Logical-mathematical intelligence** is the ability to use numbers effectively, manage long chains of reasoning and involves an awareness of logical and numerical patterns.

4. **Spatial intelligence** is the ability to form a mental model of the visual-spatial world, and to be able to maneuver the model. It also includes sensitivity to colors, lines, patterns, spaces and forms, and the relationships between them.

5. **Linguistic intelligence** is the capacity to use words effectively both orally and in writing. It comprises sensitivity to the sounds, meanings and functions of language.

6. **Interpersonal intelligence** is the ability to understand the feelings, motivations and moods of other people, and respond appropriately to them.

7. **Intrapersonal intelligence** is the ability to understand oneself, to assess one's strengths, weaknesses and emotional states, and act effectively using this knowledge. It is the intelligence most difficult to define, as its expression often depends on the use of other intelligences, such as music or language.

8. **Naturalist intelligence** designates the human ability to discriminate among living things such as plants and animals, as well as sensitivity to other features of the natural world such as clouds and rock configurations.

Gardner (1999a) also supported his theory of MI by providing evidence for the multiple nature of intelligence. He maintained that damage to a specific area of the brain did not lead to the patient's failure to do tasks which were controlled by other areas. He argued that evolution of human could not be made possible unless some intelligences could develop before other mental capabilities and noted that under environmental pressure spatial intelligence was perhaps the first intelligence to develop in human beings. Evidence for the support of MI also includes presence of core operations, susceptibility to encoding, a distinct developmental progression, support from experimental psychology, and from psychometric findings.

It is worth mentioning that in comparison to previous theories of intelligence, Gardner's MI more effectively takes the role of individual differences into account and offers suggestions which are hoped to result in more democratic educational contexts which are more responsive to individual differences in learning. Gardner (1991) suggested that students possess different kinds of mind and therefore learn, remember, and perform in different and identifiably distinctive ways. He continues that until now, most schools in most cultures have stressed a specific combination of linguistic and logical intelligences and we have gone too far in ignoring the other intelligences. Gardner (1993) has two assumptions: the first is that not all the people have the same interests and abilities and not all of us learn in the same way. Second is that now days no one can learn everything. An education built on MI can be more effective than that built on just two intelligences by developing a broader range of talents and skills which can make the standard curriculum accessible to a wider range of students (Gardner, 1991). According to Gardner (1993):

> Good teachers have always realized that different approaches are effective with different kinds of students. Such sensitivities to individual differences can become part of the teacher's competence and can draw upon in the course of regular instruction as well as during assessment.

Application of Gardner's theory in second and foreign language teaching was embraced by EFL/ESL researchers who believe that MI can enable practitioners in the field to incorporate individual differences of learners into language pedagogy. Christison (1996) proposed that the first step toward the application of MI is the identification of the activities EFL/ESL frequently use in their classes, the second step is categorization of them into different intelligences, and finally the last step is conversion of these activities in lesson planning and teaching. She also underscored the importance of learners' awareness of their MI profile along with the teachings which enable them to use their MI in the most efficient way. Larsen-Freeman (2000) suggested teachers who recognize the importance of MI in their classes in fact take into consideration the strength and weaknesses of their students as well as how they can develop activities which can work best for their benefit. Richards (2001) elaborated how MI can fit into the field of language teaching. He argued that the introduction of MI which was intended to replace

the notion of intelligence as a single factor, the "g" factor, was compatible with the learner-based philosophy in general education and language teaching which emphasize learner differences. According to Richards "pedagogy is most successful when learner differences are acknowledged and analyzed for particular groups of learners and accommodated in teaching". (Richards, 2001, p. 115). And Teele (2004) also published a book in which she discussed how L1 and L2 reading tasks can be developed in recognition of the theory of MI.

However, one the thorniest issues in the way of research on the use of MI in language teaching to be addressed was the production of a reliable and valid instrument which could objectively measure students' MI. To tackle this problem, Dr. Charles Branton Shearer, a developmental psychologist at Kent State University, developed the Multiple Intelligence Development Assessment Scales (MIDAS) and published it in the form of a professional manual in which he provided strong statistical evidence for the reliability and validity of the profile and offered guidance for its use and interpretation. Shearer (1991) maintained that the MIDAS provides an objective measure of MI as reported by the person himself or by a knowledgeable informant. Moreover, Shearer received commendation from Gardner (1996) who believes that the MIDAS has been developed according to standard psychometric procedures and Shearer adopted a careful and cautious way in which he has created the instrument (Shearer 1996).

Listening Proficiency

Oxford (1993) discussed the importance of listening in language learning and noted that this skill has only been recognized relatively recently. Since the role of listening in language learning was taken for granted, it allowed little research and pedagogical attention. Although listening played an important role in audio-lingual methods, students only listened to repeat and develop a better pronunciation for speaking. Beginning in the early 70's, work by Asher and, later, Krashen, brought attention to the role of listening as a tool for understanding and a key factor in facilitating language learning and listening has emerged as an important component in the process of second language acquisition (Feyten, 1991).

In the process of listening, the aural data in the form of sound waves strike the tympanic membrane and cause it to vibrate. The energy in the waves is transformed and then carried to the central nervous system where listening comprehension happens. In the nervous system first the phonemes need to be identified and syllables and different aspects of intonation such as tone units and pitch should be perceived (Brazil, 1985, 1994; Cutler and Butterfield, 1992). After the recognition of individual words, information about the syntactic structure of the clauses which are believed to be the units of parsing (Harley, 1995) is made available for semantic analysis. The role of schematic knowledge in listening comprehension has been studied (e.g. Schank & Abelson, 1977; Anderson, 1985) and Harley (1995) discussed how individuals make use of this repertoire for making different types of inferences.

The measurement of listening comprehension has been influenced by various language and testing theories and models (e.g. Munby, 1978; Bachman, 1990; Bachman and

Palmer, 1996). One of the proficiency tests which has undergone extensive research and is widely used around the world is the Test of English as a Foreign Language (TOEFL) whose listening section was developed to measure candidates' ability to comprehend academic English. The test measures examinees' English language proficiency in situations and tasks reflective of university life in North America. The listening test measures the test takers' comprehension of details and facts, vocabulary, main ideas and supporting ideas and finally communicative function of utterances. It also measures abilities such as making inferences about the content and relationships.

The relationship between language proficiency and intelligence was first addressed by Oller (1978). In his words "language proficiency, rather than innate intelligence, may account for the lion's share of variance in the so-called IQ tests and in achievement tests as well" (p. 1). To equate intelligence with language, Oller provided three pieces of evidence: 1) statistical evidence indicating a close relationship between performance on intelligence tests and measures of language proficiency; 2) striking similarities between IQ tests and language proficiency tests in terms of their content; and 3) neurolinguistic evidence showing overlaps between the areas responsible for language and performance on IQ tests. Another almost similar comment was made by Genesee (1976). Genesee proposed that according to the results of the study those in the highest IQ group perform in a way that it could be said that the IQ profile could predict the reading and language usage test scores. Gardner (1983) also indicated that language learning, similar to many of human activities, is a complex interaction of a number of intelligences. This model offered a cognitive explanation for the differences in adult second language communicative competence, which the traditional views of intelligence did not.

With the development of multidimensional theories of intelligence which were intended to more efficiently account for individual differences, it could be argued that several aspects of listening, speaking, reading, writing and general proficiencies are influenced by different intelligences. In the process of listening comprehension, which is the focus of the present study, it seems that several aspects interact with Gardner's 8 intelligences. Sensitivity to tone, intonation and stress can have strong links with the musical intelligence and imagination of facial expression, gesture, posture, and head movements used in communication can be related to bodily-kinesthetic intelligence. The ability to draw inferences and using analogies in rule construction can be influenced by logical-mathematical intelligence and spatial intelligence may enhance sensitivity to attitudes about personal space and help listeners spatially organize the incoming information. Furthermore, linguistic intelligence seems be required at all stages of processing from sound perception to syntactic parsing and semantic analysis. Since communication does not happen in a vacuum, interpersonal intelligence for understanding the speakers' intentions, feelings and their cultural background can be hypothesized to play a pivotal role. Intrapersonal intelligence could contribute to effective use of metacognitive strategies and to the amount of anxiety, self-esteem, and affective factors in listening. And finally, recognition of patterns in speech could also be facilitated by naturalist intelligence. Therefore, the present study aims to investigate the role of MI in listening proficiency and will finally discuss contribution of each intelligence to listening comprehension which has been measured by the listening section of a retired version of TOEFL.

METHODOLOGY

Participants

The participants were 151 male and female junior and senior Persian speaking students who were randomly selected from a population of around 300 English students majoring in the English language in Mazandaran a province in northern Iran,. They first took the TOEFL listening questions and after a week's interval answered MIDAS questions.

Instrumentation

The study was carried out in two phases and in each phase one instrument was administered. In the first phase a retired version of TOEFL listening comprehension which contained 50 questions was given to the students and after a week's time the MIDAS questionnaire was administered. MIDAS is a self report measure of intellectual disposition and is completed by the person or other individuals such as parents or teachers who have enough information about the person. (Shearer, 1996). The users are asked to read each item and select what they perceive as the best answer at that point in time in their life. There are no right or wrong responses and the respondents are asked to select the option which best describes them. Research on the reliability and validity of MIDAS has revealed that the MIDAS scales can provide a reasonable estimate of one's MI strengths and limitations that correspond with external rating and criteria. (Shearer, 1996). The MIDAS scales have been translated into Spanish and Korean and completed by approximately 10,000 people world-wide. In this study a Persian translation of the questionnaire was used and its reliability with the original MIDAS was calculated. The Persian MIDAS, similar to the English version, contained 119 items and the mean alpha reliability of the 8 intelligence profiles was .77.

Procedures, statistical analysis and results

After the administration of the instruments and collection of data, descriptive statistics for both TOEFL listening and MI scores were calculated. Students' MI scores are out of 100 and their TOEFL proficiency scores are out of 50. As it can be found from the table, interpersonal intelligence has the highest mean and naturalist intelligence has the lowest mean in the population:

Table 1. Descriptive statistics for the TOEFL listening and MI scores

	N	Minimum	Maximum	Mean	Std. Deviation
Musical	151	14	93	47.35	14.45
Kinest	151	6	90	45.45	18.03
Math	151	20	85	49.85	13.46
Spatial	151	20	94	53.81	14.92
Ling	151	16	91	51.69	15.93
Interper	151	30	91	62.40	15.05
Intraper	151	30	88	56.57	12.83
Natur	151	5	88	40.53	16.95
TOEFL Listening	151	10	27	16.54	4.30

Music: Musical; Kinest: Kinesthetic; Spat: Spatial; Math: Logical-Mathematical; Ling: Linguistic; Inter: Interpersonal; Intra: Intrapersonal; Natur: Naturalist

The relationship between the MI scores and listening proficiency was investigated by calculating the correlation between each intelligence and the TOEFL listening scores. (Table 2):

Table 2. Correlation analysis of each intelligence with TOEFL listening comprehension scores

	TOEFL listening
Musical	.08
Kinesthetic	.11
Logical-mathematical	.00
Spatial	.09
Linguistic	.19*
Interpersonal	.06
Interpersonal	.00
Naturalist	.02

*Correlation is significant at 0.05

According to the results of correlation analysis, all the intelligences positively correlate with TOEFL listening and the correlation between linguistic intelligence and TOEFL listening comprehension is relatively low but statistically significant. Further investigation of the role of MI was done by doing regression analysis. After doing stepwise regression analysis, it was found that from among 8 intelligences only linguistic intelligence is included as a predictor of listening comprehension scores and other intelligences are excluded (Table 3).

Table 3. Stepwise regression analysis

Modal	R	R Square	Adjusted R Square	Std. Error of the Estimate
	.19	.03	.03	4.23

a. Predictor: (Constant), Linguistic intelligence

DISCUSSION

As it was revealed by the results of correlation analysis, although all the intelligences positively contribute to listening comprehension, it is only linguistic intelligence that has a low but statistically significant role. According to Hatch and Lazaraton (1991) a correlation in the .30s or lower may appear weak but in educational research, as they suggest, even such a low correlation might be very important. The results of regression analysis also indicated that linguistic intelligence is a predictor of listening comprehension score, though a weak one.

As it was already discussed, hypothetically all the listening activities contain some musical, kinesthetic, spatial, logical-mathematical, linguistic, interpersonal, intrapersonal, and naturalist aspects which might contribute to comprehension; however, the results of the study suggest that despite the positive contribution of these intelligences, it is only linguistic intelligence that plays a fairly small role in listening performance. Therefore, it can be argued that except for learners with high linguistic intelligence who might be in an advantageous position, others are similar as far as the listening outcome is concerned. The results also reveal that teachers should provide English language learners who are not linguistically intelligent with further assistance and support and motivate them to perform more linguistic tasks so that they can better improve their listening skills.

It is hoped that other researchers can examine the validity of the results by replicating the present study with learners in other countries and with different L1 backgrounds. Moreover, the findings of the present study show that MI is a viable method to investigate issues in applied linguistics and it is hoped that other studies will focus on the role of MI in other areas of language learning and teaching in applied linguistics.

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