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Research Paper

## Relationship between Iranian Undergraduate English Students' Bodily-Kinesthetic Intelligence and their Grammar Knowledge

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### Abstract

This study investigated the bodily-kinesthetic intelligence of Iranian undergraduate students in the English language and its relationship with their grammar knowledge. For this purpose, 139 male (N=46) and female (N=93) English language students aged 22 -32 years old were randomly selected as the participants. Multiple Intelligence Questionnaire (MIQ) and a grammar TOEFL test were used to evaluate the bodily-kinesthetic intelligence of the students and measure their grammar knowledge. Bodily-kinesthetic intelligence of students and its relationship with grammar knowledge was gauged using descriptive statistics and correlation analysis. The means of males and females in grammar knowledge and bodily-kinesthetic intelligence were assessed through a one-way sample *t*-test. The findings revealed a statistically significant relationship between the bodily-kinesthetic intelligence of the participants and their grammar knowledge. The findings also showed no remarkable differences between males and females regarding bodily-kinesthetic intelligence and grammar knowledge. The findings imply that English language teachers should utilize the same effective grammar textbooks and tasks for both male and female students.

**Keywords:** *Bodily-Kinesthetic Intelligence; English Language; Grammar Knowledge; Iranian Undergraduate Students*

### هوش بدنی-جنبشی دانشجویان دختر و پسر ایرانی مقطع کارشناسی زبان انگلیسی و رابطه آن با دانش دستور زبان

این پژوهش به بررسی رابطه بین هوش بدنی-جنبشی دانشجویان دختر و پسر ایرانی در مقطع کارشناسی زبان انگلیسی و دانش دستوری زبان آنها پرداخت. جهت انجام این پژوهش، تعداد ۱۳۹ دانشجو شامل ۴۶ دختر و ۹۳ پسر دانشجوی زبان انگلیسی بین سنین ۲۲ تا ۳۲ به طور تصادفی به عنوان نمونه آماری این پژوهش انتخاب شدند. از پرسشنامه هوش چندگانه (MIQ) و آزمون تافل دستور زبان جهت ارزیابی هوش بدنی-جنبشی دانشجویان و تعیین سطح دانش دستوری زبان استفاده شد. این رابطه با استفاده از آمار توصیفی و تحلیل همبستگی به دست آمد. سپس، با استفاده از آزمون *t* نمونه مستقل تفاوت بین دختران و پسران مورد ارزیابی قرار گرفت. یافته‌ها نشان داد که رابطه بین هوش بدنی-جنبشی و دانش دستور زبان دانشجویان از نظر آماری معنادار است. این یافته‌ها همچنین نشان داد که دختران و پسران دانشجویان از نظر هوش بدنی-جنبشی و دانش دستور زبان انگلیسی با همدیگر تفاوت معناداری نداشتند. یافته‌ها پیشنهاد می‌کند که دبیران حرفه‌ای زبان انگلیسی از کتاب‌های درسی و تکالیف کلاسی یکسانی برای همه دانشجویان زبان انگلیسی در فرایند یادگیری و آموزش جهت یادگیری دستور زبان استفاده کنند.

**کلمات کلیدی:** هوش بدنی-جنبشی، دانشجویان دختر و پسر مقطع کارشناسی، زبان انگلیسی، دانش دستوری

## Introduction

Intelligence is a higher-level capacity including mental representation, abstract reasoning, decision making, and problem-solving. It is the ability to learn a second language, creativity, and emotional knowledge (Gardner, 2011 & Armstrong, 2008). On the other hand, intelligence is an individual's specific capacity that "enables the individuals to pinpoint the most appropriate solutions when they are approaching various problems in particular cultural settings" (Gardner, 2006, pp. 60-61).

Bodily-kinesthetic intelligence is the ability to utilize the body expressively or skillfully (Armstrong, 2008). This type of intelligence entails the ability to utilize the whole body or some parts of the body to fashion products and solve problems in different situations. In a sense, bodily-kinesthetic intelligence is the capacity to apply mental abilities to coordinate bodily movements, create products and perform skills through mind-body union (Gardner, 1999).

Grammar knowledge is "a central characterization including intelligence which regulates and manages to learn" (McLaughlin, 1987, p.67). English language students who acquire the structure system and meaning of language can establish communication with other people because they intently understand the grammar system of that language which is the rules of making meaning (Erlina, Marzulina & Astrid, 2019). In other words, while learners have acquired grammar, it will be simpler for them to grasp how to manage and convey the ideas in their minds without any problem. The learners can talk, study and write the language more coherently (Erlina, Marzulina & Astrid, 2019).

The role of bodily-kinesthetic intelligence as one type of MI theory in the learning and teaching processes of language for English students reinforced instructors and English language teachers to deliberate the gender differences in the education system at universities between males and females. In addition, the significance of bodily-kinesthetic intelligence and its function in learning will contribute instructors to considering the feasible impacts of this type of intelligence on grammar learning. Consequently, it also makes the instructors look at meeting the needs of the students in the classroom and provide students with specific instruction and curriculum efficiently (Sadeghi, 2013).

Whereas teaching is one of the most important instruments of education and its main function in learning is so considerable, English language instructors have always considered some important factors in grammar learning such as intelligence which was measured only by a single Intelligence Quotient (IQ) score (Shahrokhi, Ketabi & Amiri Dehnoo, 2013). They did not provide an expansive aspect of bodily-kinesthetic intelligence and its important function to help students with grammar learning and teaching efficiently. Consequently, this study deliberated gender differences between Iranian male and female undergraduate students in the English language particularly, regarding bodily-kinesthetic intelligence and its relationship with their grammar knowledge. Accordingly, to deliberate the aims of this study the present research questions were asked:

**RQ1.** Is there any relationship between the bodily-kinesthetic intelligence of Iranian EFL undergraduate students and their grammar knowledge?

**RQ2.** Is there any difference between Iranian EFL male and female students regarding bodily-kinesthetic intelligence and their grammar knowledge?

## Review of Literature

### Intelligence Testing

The history of intelligence testing dates back to the nineteenth century. During this time, after Wilhelm Wundt, Sir Francis Galton (1885) put forward Intelligence Quotient (IQ) to measure the inherent relationship between human ability and heredity for the first time (Martins, 2018). With

the importance of IQ in education, Lambert provided a statistical method to discover human properties (Martins, 2018). This process continued until the father of IQ testing namely Alfred Binet with the assistance of Simon designed the first intelligence test in 1905 (Noack, 2014). After that time, E.L. Thorndike in the nineteenth century organized an innovative test to value mathematical ability and individuals' linguistics. This type of test was the foundation of advanced intelligence tests that all educated people know today (Ahmadian & Hossieni, 2012).

Despite having the traditional views of the different concepts of IQ, Gardner (2011) claimed that intelligence cannot be measured only by a single IQ score (1983). He also claimed that human talents consist of eight types of intelligence including linguistic, logical, musical, spatial, intrapersonal, interpersonal, bodily-kinesthetic, and naturalistic intelligence (Armstrong, 2008).

### **Bodily-Kinesthetic Intelligence**

Bodily-Kinesthetic Intelligence is the ability to utilize all parts of the body expressively or skillfully (Armstrong, 2008). This one type of multiple intelligences is the capacity that entails the ability to use the whole body or some parts of the body to fashion products and solve problems in different situations (Gardner, 1999). In a sense, bodily-kinesthetic intelligence is the capacity to utilize mental abilities to coordinate bodily movements, create products, solve problems and perform skills through mind-body union (Gardner, 1999).

Students who have a high level of bodily-kinesthetic intelligence have a sense of timing, coordination for whole-body movement, and the use of their hands, and other parts of their body to manipulate objects (Gardner, 1983). These students can utilize the whole of their body parts in skilled and complicated methods for expressive and goal-directed tasks and activities (Gardner, 1983). According to Gardner (1983) these students "use their hands with dexterity and skill for detailed tasks and expressive movements. They can move the whole their body for physical activities including balancing, coordination, and sports" (p.358).

In bodily-kinesthetic intelligence, students can do their actions with movements and physical gestures. They are generally good at physical and mental activities such as practical sports and doing exercises that are related to education. They often prefer these activities to do (Armstrong, 2018). Students who have a high level of bodily-kinesthetic intelligence enjoy acting, touching, gesturing, and in general, they are good at making things that they like (Kennedy, 2015). These students all have a natural sense of how their body parts should act and react in a demanding physical position (Armstrong, 2000). They usually are athletes, physical education trainers and teachers, coaches, physical therapists, and aerobics instructors (Armstrong, 2000).

In bodily-kinesthetic intelligence, students learn best when they are allowed to utilize their tactile senses and fine and utilize motor movement as part of the learning process (Laughin, 1999, cited in Abdallah, 2008, Hoerr, Boggeman & Wallach, 2015). These students prefer direct involvement with the material they are learning than worksheets or reading from a book (Shearer, 1996). Bodily-kinesthetic intelligence "is an appropriate instrument for instruction in projects that involves the learner in creating displays and props that describe the subject matter which may be suitable for this group of students" (Erlina, Marzulina & Astrid, 2019, p.2143).

Male students usually tend to learn more whereas female students are more performance-oriented and social students. On the other hand, female students pay more attention to social interactions and self-confidence while male students attribute success to extracurricular activities such as teaching. Female students usually attribute their success directly to their efforts and are more inclined to natural issues and criticize themselves in learning (Viriya & Sapsirin, 2014).

To deliberate bodily-kinesthetic intelligence of male and female undergraduate students in the English language and its relationship with their grammar knowledge along with gender differences, Viriya and Sapsirin (2014) considered the relationship between this type of intelligence and grammar knowledge of students in the English language. The results showed a

feasible relationship between bodily-kinesthetic intelligence and grammar knowledge of students. The results of this study also indicated that there was no statistically remarkable difference between male and female students concerning bodily-kinesthetic intelligence and their grammar knowledge.

Sogutlu (2018) conducted a study namely gender differences between male and female undergraduate students in the English language regarding bodily-kinesthetic intelligence and Grammar knowledge. The findings of this study revealed that bodily-kinesthetic intelligence had a significant relationship with students' success in language learning. The results of this study also indicated that there was no statistically remarkable difference between male and female students in terms of bodily-kinesthetic intelligence and their grammar knowledge.

Razmjoo (2008) in a study considered the relationship between multiple intelligences and language proficiency. The results of his study revealed no significant difference between male and female university students regarding language proficiency, particularly in grammar learning and types of intelligence.

In another study, Saricaoglu and Arikan (2009) considered gender differences between male and female university students related to grammar learning. The results of this study revealed there were no statistically meaningful differences between male and female university students and their grammar learning.

### **Bodily-Kinesthetic Intelligence and Grammar knowledge**

MI pedagogy focuses on the language class as the setting for a series of educational support systems aimed at making the language learner a better designer of his/ her own learning experiences. Such a learner is both better empowered and more fulfilled than a learner in traditional classrooms (Richards & Rodgers, 2001).

Tom Gardner (2006) "all schools should provide individualized education to meet the essential needs of language learners in the classroom" (p. 61). This contributes students to finding out where their powers and weaknesses are to be more responsible for their learning process. Being familiar with the powers and weaknesses of male and female students regarding MI would assist both instructors and students to develop, and advancing language skills to select appropriate curriculum design and learning way (Sadeghi, 2013).

On the other hand, being able to recognize both success and challenges in the classroom can build self-esteem and the confidence to try. This is also achieved in a learning environment where students learn that they can contribute to the collective (Alborn, 2006). In fact, by providing and employing some activities regarding bodily-kinesthetic intelligence in the classroom which can be utilized in different ways, "instructors can provide a good variety of evaluation by considering different ways to evaluate students" (Armstrong, 2018).

To apply bodily-kinesthetic intelligence of students in the classroom, students should be motivated to have a sense of timing, coordination for whole-body movement, and the use of hands for manipulating objects. They should be encouraged to use their body in skilled and complicated ways for expressive and goal-directed activities such as balancing, coordination, and sports (Gardner, 1983). By providing these activities, they enjoy acting, dancing, touching, gesturing, and in general, they are good at making things that they like (Armstrong, 2000).

## **Methodology**

### **Participants**

The participants of this study were 200 male (N=61) and female (N=139) undergraduate English language and literature students between 22 to 32 years old, who were selected randomly. They were homogenized on the basis of their scores in a TOEFL grammar test, falling within one

standard deviation minus and one standard deviation plus the mean. The students (N=61) who scored very high or very low on the TOEFL test were excluded from the data. Therefore, the number of the participants reached (N=139) including males (N=46) and females(N=93).

### Instruments

To collect the needed data, the Multiple Intelligence Questionnaire (MIQ) and a TOEFL test were administered. Multiple Intelligence Questionnaire (MIQ) was run to specify the participants' types of intelligence such as linguistic, logical, spatial, musical, bodily-kinesthetic, interpersonal, intrapersonal, and naturalist intelligence. The alpha reliability of the eight profile scores of the questionnaire in this study collectively was found 87. The TOEFL test was run on the participants to measure the participants' level of grammar knowledge. This test was also used to check the homogeneity of their scores. This test included 25 multiple-choice items.

### Data Collection Procedure

To collect the data needed for analysis, the multiple intelligence questionnaire (MIQ) was first administered in a number of sessions. The time that collapsed for the first session was 40 minutes. Then, to measure the participants' grammar knowledge and check their homogeneity, the TOEFL test was run. The time allocated to the second session was 25 minutes. After obtaining the TOEFL grammar scores, 139 students whose scores were one standard deviation minus and the mean were selected for the study, and 61 students who scored very high or very low on TOEFL were excluded from the TOEFL data. Therefore, the number of participants reached 139 including males (N=46) and females (N=93). Finally, descriptive statistics and correlation analysis were conducted to deliberate bodily-kinesthetic intelligence and its feasible relationship with their grammar knowledge. Then, by employing a sample *t*-test, the difference between males and females regarding bodily-kinesthetic intelligence and grammar knowledge was determined.

Variable	N	Mean	$\pm$ SD	Correlation	Sig.	Minimum	Maximum
LIL	139	3.5	1.63	.78	.001	1	6
LOL	139	3.39	1.69	.11	.22	1	6
SPI	139	3.21	1.52	.07	.44	1	6
MUI	139	3.4	1.54	.02	.83	1	6
BOI	139	3.47	1.52	.68	.001	1	6
INTERL	139	3.65	1.58	.05	.14	1	6
INTRAI	139	3.35	1.51	.64	.001	1	6
NAI	139	3.79	1.5	.08	.34	1	6
GM	139	13.83	.83	---	---	13	15

### Results

To find the answers to the research questions of this research, descriptive statistics, correlation analysis and one way sample *t*- test were applied. The following tables reveal the results. Based on the results in Table 1, it can be claimed that bodily-kinesthetic Intelligence has a statistically positive relationship with grammar knowledge ( $p=0.68$ ). On the other hand, the significant level of this type of relationship between intelligence and grammar scores is found at .001.

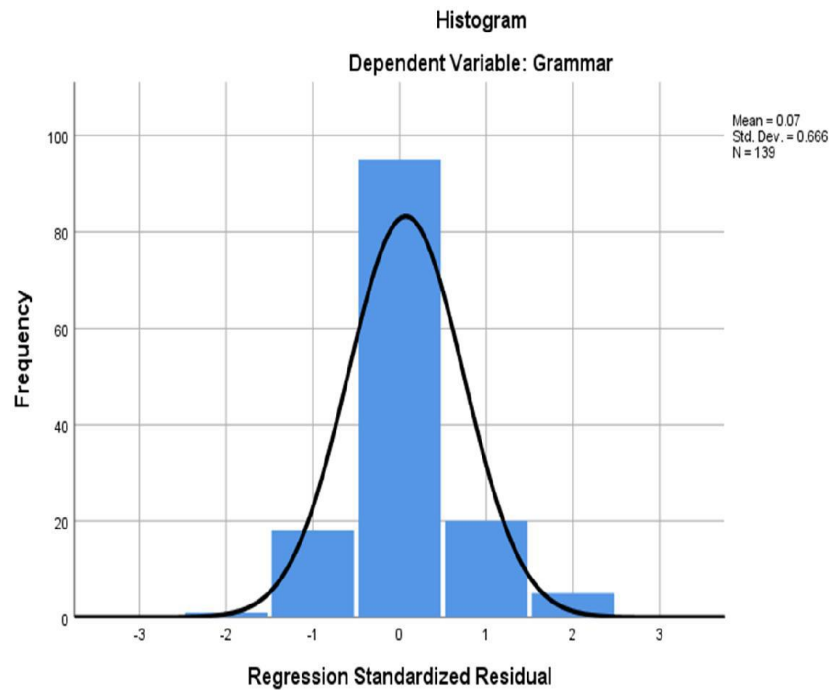
**Figure 1***Bodily-kinesthetic intelligence and its relationship with Grammar*

Figure 1 presents the range of this type of relationship between bodily-kinesthetic intelligence and grammar knowledge of the participants.

To find the answer to the second research question of the study, a one-way sample *t*-test was run and the means of males and females were compared (Table 2).

**Table 2***Sample t-test to compare the means of male and female students*

Variable	Gender	Mean	SD	t-test	Sig.
LII	M	4.04	±1.43	1.81	.11
	F	3.97	±1.66		
LOI	M	3.37	±1.73	-.13	.89
	F	3.41	±1.68		
SPI	M	3.17	±1.68	-.18	.86
	F	3.23	±1.47		
MUI	M	3.35	±1.61	-.29	.77
	F	3.43	±1.51		
BOI	M	3.81	±1.45	1.85	.07
	F	3.31	±1.53		
INTERIOR	M	3.5	±1.24	-.81	.42
	F	3.73	±1.73		
INTRA	M	3.5	±1.54	1.05	.29
	F	3.26	±1.49		
NAI	M	3.54	±1.54	-1.61	.11
	F	3.26	±1.49		
GM Scores	M	13.98	±.86	1.51	.13
	F	13.75	±.82		

As Table 2 shows there is not any remarkable difference between male and female students in the English language regarding bodily-kinesthetic intelligence and their grammar knowledge. At the same time, comparing the means between males and females indicates that there is no considerable difference between male and female undergraduate students in the English language regarding bodily-kinesthetic intelligence. In fact, since the level of bodily-kinesthetic intelligence variable is more than 0.05, there is no significant difference between male and female undergraduate students in the English language regarding bodily-kinesthetic intelligence and grammar knowledge.

### Discussion

The investigation of bodily-kinesthetic intelligence of Iranian male and female undergraduate students in the English language and its relationship with their grammar knowledge revealed that there is a significant relationship between bodily-kinesthetic intelligence and grammar knowledge of the participants. This is justifiable because grammar knowledge is a central characterization of intelligence that regulates and manages performance (McLaughlin, 1987). This finding, as Gardner (1999) believes, supports the idea of utilizing one's whole body or some parts of the body to fashion products, solve problems, coordinate bodily movements, create products, and perform skills through mind-body union in different situations). In fact, students have a sense of timing, coordination for whole-body movement, and the use of their hands and other parts of their body to manipulate objects (Gardner, 1983). Based on this idea, these students can utilize the whole of their body parts in skilled and complicated methods for expressive and goal-directed tasks and activities in the classroom (Gardner, 1983). Accordingly, the finding of this study shows that bodily-kinesthetic intelligence is a type of multiple intelligences which has a positive relationship with the grammar knowledge of students.

The finding of the current study is in line with those of some other conducted studies such as Saricaoglu and Arikan (2009), Ghonchepour and Moghaddam (2018) Xhomara and Shkemi (2020), and Sogutlu (2018), which have all concluded that bodily-kinesthetic intelligence and students' grammar knowledge meaningfully correlate with one other.

The findings of a one-way sample *t-test* which was conducted to match the means between male and female students indicated that there is no remarkable difference between males and females regarding bodily-kinesthetic intelligence and grammar knowledge. This is consistent with previously conducted studies such as those of Razmjoo(2008), Saricaoglu and Arikan (2009), Viriya and Sapsirin (2014), and Sogutlu (2018) which have revealed that there was no statistical significance difference between male and female students regarding language success and types of intelligence. This means that the second research question of the present study is approved. According to this finding, in terms of bodily-kinesthetic intelligence, both male and female students can learn best when they are allowed to utilize their tactile senses and utilize motor movement as part of the learning process. These students prefer direct involvement with the material they are learning than worksheets or reading from a book (Shearer, 1996). The act of writing can contribute to these students who have the capacity of bodily-kinesthetic intelligence to retain and process the knowledge and information that they are writing about, because writing an answer to a question before saying it may be of value to these students (Erlina, Marzulina & Astrid, 2019). Bodily-kinesthetic intelligence is an appropriate instrument for instruction in projects that involves the learner in creating displays and props that describe the subject matter which may be suitable for this group of students (Erlina, Marzulina & Astrid, 2019). Depending on the above consideration, the finding of this study shows that the difference between males and females regarding intelligence is affected by some cognitive and emotional factors including bodily-kinesthetic intelligence that instructors and teachers should pay more attention to in grammar knowledge. Male students attribute their success to extracurricular activities such as teaching, while female students pay a lot of attention to social interactions and self-confidence.



Female students usually attribute their success directly to their efforts and are more inclined to natural issues and criticize themselves in learning (Viriya & Sapsirin, 2014).

### Conclusions

This study revealed that the bodily-kinesthetic intelligence of undergraduate English language students and their grammar knowledge is closely related and gender differences between students in grammar knowledge are not an important factor in the learning process. The results of the study showed that bodily-kinesthetic intelligence has statistically a positive relationship with the knowledge of the grammar of students and between male and female students of the English language regarding bodily-kinesthetic intelligence in grammar knowledge, there is not a remarkable difference. Consequently, this means being familiar with the functions of bodily-kinesthetic intelligence can be constructive for students and instructors of English pedagogy who try to have a deeper understanding of the aspects and concepts of intelligence.

The finding of this study has some fundamental and applied implications for EFL instructors and male and female students. Male and female students with meaningful bodily-kinesthetic intelligence are usually intelligent in grammar performance and writing makes them enjoy it. At the same time, both males and females with powerful bodily-kinesthetic intelligence may perceive what is related to their body flexibility. This is the ability to use the body expressively or skillfully in different fields of learning. Developing bodily-kinesthetic intelligence includes motivating male and female students to have fun with applied and real actions through reading and writing. This permits them to understand the aim of language and encourages them to pay more attention to it. Awareness of cognitive abilities including intelligence and bodily-kinesthetic intelligence in teaching and learning processes can contribute to both English instructors and students to be aware that grammar knowledge will be affected by bodily-kinesthetic intelligence. Furthermore, being familiar with the effects of bodily-kinesthetic intelligence on education motivates instructors to think about how language grammar learning takes place. This encourages English instructors to guide their students completely along with gender differences and be prepared for more constructive learning tasks. As a result, bodily-kinesthetic intelligence assists the students to increase their success level in grammar learning because it puts more focus on everything which is regarded as language skills and its effect on knowledge of grammar.

A final word is that the present study was limited to the context in which all participants were Iranian male and female undergraduate students of English. Therefore, these finding cannot be overgeneralized to other Iranian university students in other areas of study. Also, this study was limited to the TOEFL grammar test, not to other aspects of language such as speaking, reading and listening. Thus, English teachers are encouraged to deliberate on the impacts of bodily-kinesthetic intelligence on other language learning skills.

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### **Biodata**

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