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Original Article

The Effect of Brain Dominance on Task-based Reading Comprehension among Iranian EFL Learners

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Abstract

One of the decisive factors affecting language learners' learning is brain dominance. The present research was conducted to investigate the effect of brain dominance on task-based reading comprehension of Iranian EFL learners. To this aim, 50 intermediate Iranian EFL learners were selected as the study sample. The instrumentation included the ECPE test of proficiency, a hemispheric dominance questionnaire and a reading comprehension post-test. The four tasks of *Problem Solving, Information Gap, Jigsaw, and Decision Making* were chosen. Statistical analysis revealed that the difference in the performance of the three groups of right-, left-, and whole-brainers was insignificant on all of the presented tasks. Thus, it was found that brain dominance, as an independent variable, is not a correlate of success and achievement on task-based reading comprehension, as a dependent variable.

Keywords: Brain Dominance, Left-Brain Dominant, Right-Brain Dominant, Task-Based Language Teaching (TBLT), Task-Based Reading Comprehension, Whole-Brain Dominant.

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1. Introduction

A large number of cognitive learning styles have been identified by scholars in the field of applied linguistics (Ehrman & Leaver, 2003; Wintergerst et al., 2001). Literally, dozens of different styles have been identified. Ehrman and Leaver (2003) introduced nine such styles: (a) Field Independence-Dependence, (b) Random (Non-linear) vs. Sequential (Linear), (c) Global vs. Particular, (d) Inductive vs. Deductive, (e) Synthetic vs. Analytic, (f) Analogue vs. Digital, (g) Concrete vs. Abstract, (h) Leveling vs. Sharpening, (i) Impulsive vs. Reflective. Brown (2002) has added other factors, including Left-and Right-brain Dominance, Ambiguity Tolerance, and Visual/Auditory/Kinesthetic styles.

In the present study, we are concerned with brain dominance. Undoubtedly, the brain is the most convoluted part of humans' bodies (Fromkin et al., 2014). This complex entity, comprised of two hemispheres, is right and left, has been the subject of many studies from the point of view of hemisphericity in the field of applied linguistics (Czajka, 2012; Dulger, 2012; Kordjazi & Ghonsooli, 2015). In some people, the right and in some others the left hemispheres are dominant or more active than the other one.

Closely related to the present study is the skill of reading. Simply put, reading is a receptive skill which differs from productive skills in the sense of producing language forms; rather, it is concerned with the process of comprehension: a process that is far from being passive. Conversely, it is actively performed by the reader.

The task-based approach is one of the approaches to reading. There has been a number of studies on task-based reading comprehension (Chalak, 2015; Kamalian et al., 2017; Nahavandi, 2011). In these studies, the researchers have embarked on probing into different aspects of task-based reading comprehension none of which focused on the relationship between that and brain dominance.

In the light of a myriad of studies on the effect of brain dominance on learning different skills of language and their components, some aspects of this relationship have become evident. One of the aspects of the foregoing relationship which has not been probed into so far is the relationship between brain dominance and task-based reading comprehension achievement of EFL learners. Accordingly, the present study intends to probe into this relationship.

By considering the myriad of related studies on the relationship between brain dominance and the learning of different skills and sub-skills of EFL or ESL, it can be

ascertained that if a given teacher considers the factor of brain dominance, a great favor will be done to the learners. One thing should not go unnoticed, that the present study is important and necessary to be undertaken in that gaining an understanding of what kind of differences exist among different groups of brainers in terms of their performance on reading tasks in language learning will be conducive to better success and achievement in teaching and learning a language on the parts of the teacher and the learners. In other words, the present study is important and contributing to the field of applied linguistics in that its results can show whether a given teacher should adopt different approaches and use different techniques and ways of presenting written material and information in teaching reading to students in order that they take in those materials and information to the fullest possible extent.

2. Literature Review

2.1. Neurological Aspects of the Study

Central to the current study is the cognizance of the neurological aspects of the issue at hand, that is becoming familiar with the structure of the brain and its functions in comprehension and production of language, that is knowing the language center in the left hemisphere and its functions and roles in language processing both in general and in particular.

2.1.1. General Structure of the Brain

Indeed, the most complicated organ in terms of internal structure and interconnections is the brain (Fromkin et al., 2014). Ullman, cited in Fasold and Connor-Linton (2013, p. 237), explains that "the largest part of the brain, and the most important for cognitive function, is the cerebrum. The cerebrum is composed of two hemispheres, which are more or less mirror images of each other".

On the structure of the brain, it can be asserted that the brain is a whole comprised of two vertical halves that are more or less identical in shape i.e. it is similar to a walnut which has the two parts joined to each other around the middle. The only difference is that the space between the two halves is less in the real brain. These two right and left halves are called *right* and *left hemispheres*. The hemispheres arise from the *brain stem* connecting to the *spinal cord*. Between the two hemispheres and connecting them is the

corpus callosum composed of a bundle of nerve fibers. The brain and the spinal cord are called the *central nervous system*. The covering on the hemispheres is called the *cortex* which is responsible for higher brain functions (Steinberg & Sciarini, 2006, pp. 242-3). The cortex is marked by a pattern of hill-like parts called *gyri*, and valley-like parts called *sulci* (Field, 2004).

The major divisions of the brain, each existing in the two halves, are as follows:

"a. *temporal lobe*, the thumb like shape,

b. *frontal lobe*, above and in front of the temporal lobe,

c. *occipital lobe*, behind the temporal lobe,

d. *parietal lobe*, above and behind the temporal lobe" (Hudson, 2000, pp. 151-2).

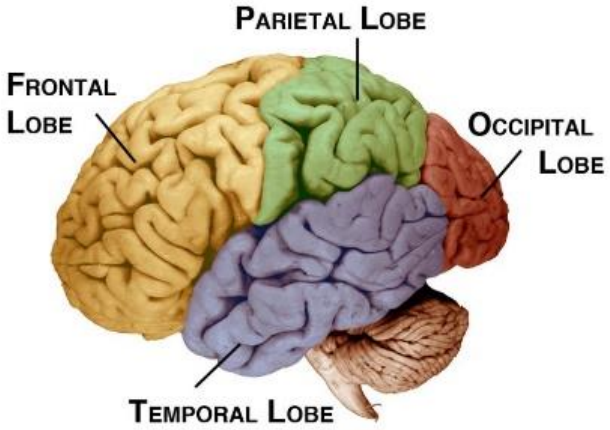

Figure 1. Major divisions of the brain.

2.1.2. Language Centers

A closely related issue is the issue of language centers. "The most fundamental biological fact about language is that it is stored in the brain" (Fernandez & Cairns, 2010, p. 81). The localization theory, proposed by Gall in the early nineteenth century, as Fromkin et al., (2014, p. 462) put it, holds that "different human cognitive abilities and behaviors are localized in specific parts of the brain." Akmajian et al. (2010, p. 533) aver that "Today scientists agree that specific neuroanatomic structures, generally of the left hemisphere, are vital for speech and language, but debate continues as to which structures are committed to the various linguistic capacities".

General condition is such that, in left-handers, in 65% of the population, language centers are located in the right hemisphere, while in right-handers, language centers are

located in the left hemisphere in about 90% of the population. Particularly involved in language processing are two areas of the language-dominant hemisphere, namely, *Broca* and *Wernicke's areas*. Broca's area is located on the language-dominant frontal lobe above the forward part of the temporal lobe and is responsible for the production of speech. Wernicke's area is located on the language-dominant hemisphere in the area where the upper temporal lobe joins the parietal lobe and is responsible for comprehension of speech (Hudson, 2000).

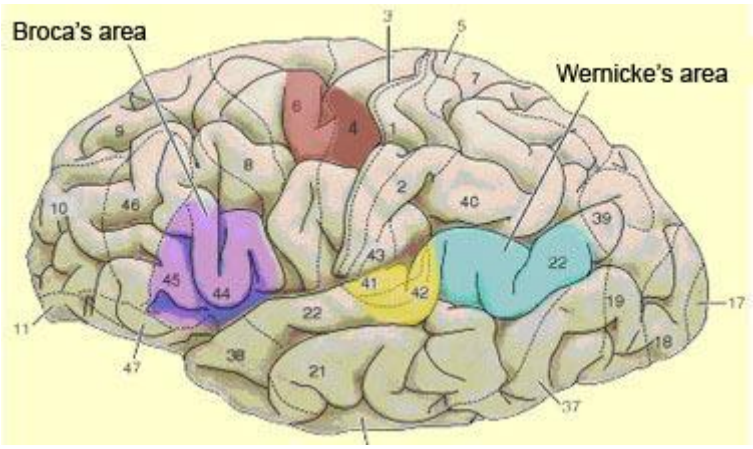

Figure 2. Language centers.

Steinberg and Sciarini (2006) define Language centers as: "The areas that have been proposed for the processing of speaking, listening, reading, writing, and singing are mainly located at or around the Sylvian and Rolando fissures." They continue, elaborating on them, that other identified areas are: (a) the front part of the parietal lobe, (b) The area in front of the fissure of Ronaldo, (c) An area in the upper back part of the temporal lobe, (d) An area in the upper part of the temporal lobe, (e) The lower back part of the frontal lobe, (f) An area towards the back of the frontal lobe, (g) Part of the left parietal region, and (h) An area at the back of the occipital lobe (Steinberg & Sciarini, 2006).

2.1.3. Hemispheric Dominance

The time has come to probe into hemispheric dominance. It is a phenomenon in which one of the two hemispheres takes over the ground and becomes the controlling one (Steinberg & Sciarini, 2006). For each of the two dominant hemispheres, there are a set of characteristics peculiar to right and left-brainers. Brown (2007, p. 125) mentions some

characteristics of the two: "The left hemisphere is associated with logical, analytical thought, with mathematical and linear processing of information. The right hemisphere perceives and remembers visual, tactile, and auditory images; it is more efficient in processing holistic, integrative, and emotional information". Torrance (1980) lists several characteristics of left-and right-brain dominance. (see Table 1)

Table 1.

Left-and Right-Brain Characteristics (Adapted from Torrance, 1980)

Left-brain Dominance	Right-brain Dominance
Intellectual	Intuitive
Remembers names	Remembers faces
Responds to verbal instructions and explanations	Responds to demonstrated, illustrated, or symbolic instruction
Experiments systematically and with control	Experiments randomly and with less Restraint
Makes objective judgments	Makes subjective judgments
Planned and structured	Fluid and spontaneous
Prefers established, certain information	Prefers elusive, uncertain information
Analytic reader	Synthesizing reader
Reliance on language in thinking and remembering	Reliance on images in thinking and remembering
Prefers talking and writing	Prefers drawing and manipulating objects
Prefers multiple-choice tests	Prefers open-ended questions
Controls feelings	More free with feelings
Not good at interpreting body language	Good at interpreting body language
Rarely uses metaphors	Frequently uses metaphors
Favors logical problem solving	Favors intuitive problem solving

2.2. L2 Reading Skill

2.2.1. The Skill of Reading Comprehension

To define, "Reading is a fluent process of readers combining information from a text and their own background knowledge to build meaning" (Anderson, 2003, p. 68). In the alleged process, relevant and background information must be activated to permit the flow of information between the sender of the message, that is the writer, and the receiver of that, that is the reader. Reading is sometimes erroneously regarded as a passive process

since there is not the production of language in this process in the sense that exists in other productive skills of speaking and writing; nevertheless, it involves active mental processing in the course of the creation of communication. The caveat that arises from this discussion is that perpetuating this misconception about reading as a passive skill results in students' misconception about reading consequently distorting the role they should play in the process (Chastain, 1988). Simply put, reading is a receptive skill that differs from the aforementioned productive skills in the sense of producing language forms, rather it is concerned with the process of comprehension: a process which is far from being passive. Conversely, it is actively performed by the reader.

2.2.2. Types of Reading

Since the present study deals with reading from a task-based view and to make an all-out effort to understand what reading is, it is better to have a very brief look at reading types. Chastain (1988, p. 220) elaborating on the major types of reading asserts that there are four main reading types, namely "scanning", "skimming", "extensive", and "intensive". On the first, scanning, he mentions that "scanning serves the important purpose of giving the reader a content preview". He adds that "leafing through a magazine or glancing at the headlines in a newspaper is scanning". Skimming, on the other hand, is "investigating the contents further". Extensive reading is "reading for pleasure…to the top of speed"; on the contrary, intensive reading is "reading for information…much more slowly."

2.3. Task-Based Language Teaching

2.3.1. Approaches to Task-based Language Teaching

Task-based language teaching constitutes a strong version of communicative language teaching. It is an approach in which the central emphasis is on task as the basis of an entire language curriculum; it involves an integrated set of processes involving the specification of what and how to teach, that is content and methodology. In fact, methodology constitutes the central tenet of task-based pedagogy (Ellis, 2003, pp. 30-1).

There are some different approaches to using tasks in language pedagogy. The first to explicate is humanistic in nature. It emphasizes the achievement of students' full potential for growth by acknowledging the importance of the affective dimension in

learning as well as the cognitive. Another approach is embodied in the procedural syllabus proposed by Prabhu. He devised a series of meaning-focused activities consisting of pre-tasks, which the teacher completed with the whole class, followed by tasks where the students worked on similar activities on their own. Thus, Prabhu's tasks are cognitive in nature. A third approach is the process syllabus advocated by Breen and Candlin. The process syllabus is constructed through negotiation between the teacher and the students. Last, but not least, is metacognitive in nature, that is tasks can be designed with a metacognitive focus for learning purposes. This can be achieved by constructing tasks that help learners to become aware of, reflect on, and evaluate their own learning styles and the strategies they use to learn (Ellis, 2003, pp. 31-2).

2.4. Research Gap and Questions

There has been a spate of studies on the relationship between brain dominance and the learning of different skills and sub-skills of ESL and EFL (Czajka, 2012; Dulger, 2012; Kordjazi & Ghonsooli, 2015). None of them probed into the relationship between brain dominance and task-based reading comprehension, thus, the foregoing gap was selected as the aim of the present study.

To achieve the study objectives, the following research questions were formulated:

1. Does brain dominance affect the task-based reading performance of Iranian EFL learners?
2. Is there any significant difference between the performance of the three groups of EFL brainers (left, right and, whole) on the four tasks of reading comprehension?
3. Which group of EFL brainers outperforms the others in task-based reading?

3. Methodology

3.1. Design and Context of the Study

The present study benefits from a post-test-only design. The rationale behind selecting this type of design arose from the fact that brain dominance, as the independent variable of the present study, is an inherent characteristic of the learners, therefore no decisive and distinguishing role could be played by a pre-test. The treatments were the four reading comprehension tasks of *Jigsaw*, *Information Gap*, *Decision Making*, and *Problem Solving*. There were three groups of brainers in the experiment: right-brainers, left-

brainers, and whole-brainers. Four intact classes in two language schools were selected. In all classes, all types of brainers existed. The independent variable of the study was brain dominance with the three levels of right-, left-, and whole-brain dominance. All groups of brainers received all four types of treatment. The dependent variables of the study were the performance of learners on each of the four types of treatment.

3.2. Participants

First, 100 language learners, from two language schools and four intact classes, were selected to take the ECPE, Examination for the Certificate of Proficiency in English (Michigan University, 2010) as a result of which their proficiency level was determined. Finally, 50 learners, out of the initial 100 learners, from two language schools and four classes were chosen as the study sample whose ages ranged from 12 to 17. All of them were male intermediate Iranian learners. Their educational level was from late guidance school to high school. Based on brain dominance, 9 of them turned out to be right-brained, 24 left-brained and 17 whole-brained. They were assigned to three groups in such a way that the age range of all groups was balanced. All of them were monolingual Persian speakers.

Table 2.

Demographical Numbers of the Participants

Initial Number of the Participants	100
Final Number of the Participants	50
Right-brainers Number	9
Left-brainers Number	24
Whole-brainers Number	17

The sampling method used in the present study was a kind of non-random sampling called convenience sampling. This procedure was done in the present study. 100 available male individuals were selected to take the proficiency test. Their scores ranged from 140 to 370. After administering the test, 50 learners who were supposed to be at the same level of proficiency were chosen as the study sample.

3.3. Instruments

3.3.1. English Proficiency Test

To determine the participants' proficiency level, the ECPE, Examination for the Certificate of Proficiency in English (Michigan University, 2010), was used. The test consisted of vocabulary, grammar, and reading comprehension sections. Since item difficulty of all the items was assessed and it turned out that the items were of varying difficulty, in determining the reliability index value of the test, which was determined 0.84, the KR-20 formula (for unequal item difficulty) was used in pilot testing.

3.3.2. Hemispheric Dominance Inventory

To identify learners' brain dominance, a combination of two hemispheric dominance inventories was used, one presented by McCrone (2000), and the other by Torrance (1980). The combined inventory consisted of 50 items each with three choices. The reliability of the inventory was determined 0.78 using Cronbach's Alpha in pilot testing. The content validity of the inventory was determined through the back-translation procedure in such a way that, at first, all items were translated into Persian and then back-translated to English, and the equivalence of original English and Persian translated version was assessed by two experts. The construct validity of the Inventory was assessed by Exploratory Factor Analysis (Bachman, 2004, pp. 111-13).

3.3.3. Task-Based Reading Comprehension Post-Tests

The purpose of the tests was to ascertain to what extent any given task would positively help learners to comprehend reading materials. In all, four reading tasks were presented to the learners. Each session, one reading task was explained to the learners, and they embarked on doing that task. After each task had been presented, a test on that task was administered. The test consisted of a text followed by eight multiple-choice questions (see appendix C).

The tests all were teacher made and after being put to reliability tests in pilot testing and through the KR-20 formula (for unequal item difficulty that was proved in assessment) divulged the following results:

a. Jigsaw Task Test Reliability Index = 0.81
b. Information Gap Task Test Reliability Index = 0.71

c. Problem Solving Task Test Reliability Index = 0.57
d. Decision Making Task Test Reliability Index = 0.78

All four indices were acceptable except the third one; as a result, three items of this test (items 2, 5, and 9) were omitted and replaced after which, by a second reliability measurement, the reliability index rose to 0.74 that was an acceptable index.

3.4. Data Collection Procedure

The first step of the study was conducting pilot testing. After pilot testing, the proficiency test was administered to the participants. The administration procedure lasted for 90 minutes. After obtaining participants' test scores, one standard deviation above and one below the mean were considered one level; thus, 50 of the holders of such scores were selected as the study sample through convenience sampling.

The next step was to administer a brain dominance questionnaire. The results of the questionnaire disclosed that nine of the participants were right-brainers, 24 left-brainers, and 17 whole-brainers.

The instructional program lasted for four sessions of 75 minutes. The experiment included two phases; in the first phase, the learners were given the four types of task-based reading comprehension texts; in the second, they were tested, via multiple-choice, eight-item post-tests, based on the instruction they had received during the first phase.

3.5. Data Analysis Procedure

Analysis of the data, through SPSS statistical software, was done in two phases: descriptive and inferential. In the descriptive phase, mean, variance, and standard deviation together with some other minor statistical factors were presented. In the inferential phase, at first, since the number of participants in the sample was less than 2000, Shapiro-Wilk Normality Test was selected and exercised upon the four sets of data coming from the four post-tests. The tests divulged a normal distribution for decision-making task test scores and non-normal distributions of the data for the other three tasks tests scores. As a result, since the three groups were independent, One-Way-Balanced Analysis of Variance (ANOVA) followed by Scheffe Test (because the numbers of groups members were not equal), as the post hoc test, was used to analyze the data coming from decision-making task test scores,

and Kruskal-Wallis test was used to do the same for the other three tasks tests scores (Hatch & Lazaraton, 1991, pp. 312-35).

4. Results

By taking a look at the results, it became evident that the distribution of the test scores was not normal and the situation was not parametric. This, in addition to the fact that there were three independent groups, led the process of data analysis for the scores on the reading comprehension test to the *Kruskal-Wallis Test*. As can be seen in Table 3, the obtained *Asymp. Sig.* from *Kruskal-Wallis Test* was *.94* which was not smaller than *.05*. Therefore, it can be concluded that at the significance level of $p < .05$, $df = 2$ *and Chi-Square = .11*, the obtained *Asymp Sig.* was *.94* which was far larger than *.05* showing that there was not any significant difference among the performance of the three groups of brainers on task-based reading comprehension.

Table 3.

Kruskal-Wallis Test Results for Totality of the Tasks Test Scores

N	200
Number of Groups	3
Chi-Square	.11
Df	2
Asymp. Sig.	.94

For Jigsaw Task, the distribution of the test scores was not normal and the situation was not parametric. This, in addition to the fact that there were three independent groups, led the process of data analysis for jigsaw task test scores to the *Kruskal-Wallis Test*. As can be seen in Table 4, the obtained *Asymp. Sig.* from the *Kruskal-Wallis Test* was *.80* which was not smaller than *.05*. Therefore, it can be concluded that at the significance level of $p < .05$, $df = 2$ *and Chi-Square = .44*, the obtained *Asymp Sig.* was *.80* which was far larger than *.05* showing that there was not any significant difference among the performance of the three groups of brainers on Jigsaw task of reading comprehension.

Table 4.

Kruskal-Wallis Test Results for Jigsaw Task Test Scores

N	50
Number of Groups	3
Chi-Square	.44
Df	2
Asymp. Sig.	.80

For Problem Solving Task, the fact that distribution of the test scores was not normal and the situation was not parametric in addition to the fact that there were three independent groups, led the process of data analysis for problem-solving task test scores to the Kruskal-Wallis test. As can be seen in Table 5, the obtained *Asymp. Sig.* from the *Kruskal-Wallis Test* was *.55* which was larger than *.05*. Therefore, it can be concluded that at the significance level of $p < .05$, $df = 2$ and *Chi-Square = 1.17*, the obtained *Asymp Sig.* was *.55* which was far larger than *.05* showing that there was not any significant difference among the performance of the three groups of brainers on the problem-solving task of reading comprehension.

Table 5.

Kruskal-Wallis Test Results for Problem Solving Task Test Scores

N	50
Number of Groups	3
Chi-Square	1.17
Df	2
Asymp. Sig.	.55

For Information Gap Task, the distribution of the test scores was not normal and the situation was not parametric. In addition to this, the fact that there were three independent groups, led the process of data analysis for information gap task test scores to the *Kruskal-Wallis Test*. As can be seen in Table 6, the obtained *Asymp. Sig.* from the *Kruskal-Wallis Test* was *.67* which was not smaller than *.05*. Therefore, it can be concluded that at the significance level of $p < .05$, $df = 2$ and *Chi-Square = .77*, the obtained *Asymp Sig*. was *.67* which was far larger than *.05* showing that there was not any significant difference

among the performance of the three groups of brainers on information gap task of reading comprehension.

Table 6.

Kruskal-Wallis Test Results for Information Gap Task Test Scores

N	50
Number of Groups	3
Chi-Square	.77
Df	2
Asymp. Sig.	.67

For Decision Making Task, the distribution of the test scores was normal and the situation was parametric. This, in addition to the fact that there were three independent groups, led the process of data analysis for decision-making task test scores to *One-way Balanced ANOVA*. As can be seen in Table 7, the obtained *Asymp. Sig.* from *One-way ANOVA* was *.84* which was not smaller than *.05*. Therefore, it can be concluded that at the significance level of $p < .05$, $df = 2$ and $F = .16$, the obtained *Asymp Sig*. was *.84* which was far larger than *.05* showing that there was not any significant difference among the performance of the three groups of brainers on decision making task of reading comprehension.

Table 7.

One-Way Balanced ANOVA Results for Decision Making Task Test Scores

N	50
Number of Groups	3
F	.16
Df	2
Asymp. Sig.	.84

5. Discussion

The first research question is concerned with the performance of the three groups of brainers on the totality of task-based reading comprehension. Based on the reported results, the mean scores for right, left, and whole-brainers were *6.33, 6.22,* and *6.20* respectively. A perfunctory look at these numbers suffices to aver that the right-brained party's mean is

a bit higher than those of the other two groups although not greatly. To find out the significance of this difference, the results were put to the inferential test of *Kruskal-Wallis*, and the difference was found insignificant. So none of the three groups outperformed the others. Right-brainers, having a slightly higher mean, pave the way for a quest to find a reason or a possibility for their higher mean. The right-brainers party showed a higher mean when the procedure at hand required fluidness and spontaneity which is present in the four tasks under inspection in the present study (Torrance, 1980). Thus, this can, probably, account for the existing slight difference. Furthermore, this party of brainers benefits from better visual skills and the learning style associated with them. In the researchers' view, there could exist some relationship, although not strong, between this style of learning and their slightly higher mean on the totality of the tasks, a nexus that must be further investigated by future research.

The second research question addressed the existence and the significance of any difference among the performance of the three groups of brainers on the four reading tasks. The first task to probe into is Jigsaw. As mentioned in the results chapter, the three groups of brainers performed similarly on this task although the mean scores for the right-, left-, and whole-brainers were *6.66*, *5.91*, and *6* respectively. Based on the reported *SD*, right-brainers exhibited the least dispersion among the three groups (right-brainers' *SD = .57*, left-brainers' *SD = 2.06*, and whole-brainers' *SD = 1.49*). Therefore, the first group evinced a higher central tendency. Regarding the main issue of the second research question, although there was some difference in the mean of the three groups, inferentially statistical analysis of the results showed insignificant variation among the three groups of brainers.

The second task to discuss is problem-solving. As mentioned in the results section, on this task, similar to the previous one, the learners performed rather similarly although the mean scores for right, left, and whole-brainers were *5.33*, *6.50*, and *5.90* respectively. Based on the reported SD, left-brainers evinced the least dispersion among the three groups (right-brainers' *SD = 2.08*, left-brainers' *SD = 1.24*, whole-brainers' *SD = 1.79*). Therefore, the second group showed a higher central tendency. Regarding the second research question, that is, the difference in the performance of the three groups, it must be noted that the left-brained party enjoyed a higher mean score. But after the results were put to inferentially statistical analysis, it turned out that the difference was not significant and

that the three groups of brainers, that is left-, right-, and whole-brainers performed similarly on problem-solving tasks of reading comprehension.

The third task to delve into is the information gap. As stated in the results chapter, the three groups performed similarly on this task although the mean scores for right-, left-, and whole-brainers were *7.66, 7.33,* and *7.60* respectively. The degree of the dispersion of the three groups scores was almost similar that is right-brainers' *SD = .57,* left-brainers' *SD = .77,* and whole-brainers' *SD = .51*. As is evident from the statistics, the three groups are close to each other in central tendency. Regarding the second research question, the right-brained party enjoyed a higher mean score. Putting the results to the inferential statistics test disclosed that the difference among the three groups was not significant.

The fourth and last task to be investigated is decision making on which, similar to the previous task, the participants performed similarly. The mean scores for right-, left-, and whole-brained parties for this task were *5.66, 5.16,* and *5.30* respectively. As can be seen, the difference among the performance of the three groups is slight and in favor of right-brainers. The standard deviation of the three groups was *.57, 1.69,* and *.94* suggestive of the fact that the first party that is that of right-brainers, evinced a higher central tendency. The difference in the three groups' performance, after being put to inferentially statistical analysis, proved non-significant.

The third research question is concerned with the outperforming group on each of the four tasks of reading comprehension. The first task to discuss is Jigsaw which is concerned with forming a general picture of the text at hand. None of the three groups outperformed others on this task. The reported mean for the three groups showed that right-brainers had a higher mean on this task, but not significantly. As stated above, this party of brainers has better pictorial skills, and, based on this piece of fact, are expected to perform better whenever the formation of a global picture is the issue, the main characteristic of Jigsaw task. Thus, this can be a putative, and perhaps probable, cause and justification for right brainers' higher mean. On the task of problem-solving, none of the groups outperformed others. This task, as the second task to delve into, is in line with the formerly stated characteristics of the brainers i.e. on this task, which requires logic to the most part; the more logical group, the left thinkers, obtained a higher mean than the other two groups. Theoretically, the researcher expected that the left-brainers have the upper hand on this task since they are better logic utilizers than are right and whole brainers.

On the information gap, the three groups performed similarly, although the right-brainers had a higher mean than the other two groups. As discussed earlier, this party of brainers is better at open-endedness, fluidness, and being free with feelings. These characteristics might have helped them in obtaining a higher mean on the task of information gap which might be facilitated by these traits. Of course, further research must be done on this issue. Last, but not least, is the task of decision making. On this task, similar to the three previous tasks, none of the groups outperformed others, meanwhile, the right-brainers obtained a higher mean. This might be a result of being better intuition users as stated by Brown (2007, p. 125).

On the insignificant difference among the results of the four tasks, the role of individual differences is deserving to be noticed. The role of such individual differences as age and proficiency level is taken for granted. That is, differences in these two factors result in differences in performance among language learners (Dornyei, 2005). Thus, it is expected that if these two factors are held constant, which is true of the present research, no difference in the performance of language learners is expected, something which is in alignment with the present study and probably the cause of the indifference in its results.

The overall results of this study which revealed a weak correlation between brain dominance and task-based reading comprehension among the three groups of EFL learners were compared with other related studies. In this regard, it was found that the results of the present study were not in alignment with most of the related literature. For example, Kordjazi and Ghonsooly (2015) found that right-brainers outperformed whole- and left-brain dominant participants on picture identification tests, but, in accordance with our study, no difference was detected for the same test between left- and whole-brain dominant learners. Moreover, unlike the present study, their study revealed that left thinkers performed much better than the other respondents on multiple-choice synonyms, multiple-choice antonyms, and word-for-word translation. While, in accordance with the present study, similar performance was observed between right and whole brainers.

6. Conclusion

The simplest research situation to conclude is a case in which the results show significant statistical differences among the performance of the existing groups. This situation was not met in the present study, thus leading the conclusion to the realm of

difficulty. There is a possibility regarding the similar performance of the participants in the present study i.e. this similar performance of the groups can be attributed to individual differences among the participants, that is, their age range, and consequently their cognition development, was similar (Piaget, 1955, 1972). Also, the language proficiency of the participants in this study turned out to be similar as their language proficiency level was rated as intermediate; in addition, the three groups of brainers received the same instructional materials which probably resulted in similar reading comprehension performance among them. The alleged possibility, it is not asserted, to be the cause, but only a possible answer to the question of similar performance.

To draw a conclusion, it can be asserted that, none of the three groups of brainers outperformed the other two groups suggestive of the fact that there is not any effect of brain dominance on task-based reading comprehension. This suggests that L2 learners' brain preference cannot be regarded as a cognitive factor that may play a role in the course of task-based reading comprehension.

As is known, by a cursory glance at any practical study in the realm of applied linguistics, any such study is expected to offer some pedagogical implications to the stakeholders and to those who are involved in such practices. This study is, by no means, an exception to this rule. As a pedagogical implication, the present study has corroborated the idea that teachers can make use of task-based reading comprehension instruction irrespective of EFL learners' brain preferences. While brain dominance should be regarded as an individual learner factor that may affect the course of L2 language learning development as evidenced in the related literature, the role of such factors, namely, age, proficiency level, learning style, attitude, motivation, and willingness should be taken into account in EFL syllabus design, material development, and class activities.

Evidently, no research can be impeccable; hence, this lack of impeccability paves the way for other researchers from any geographical region to embark on bridging the gap or gaps in former researches. The present research is, by no means, an exception to this rule. The present study, in the researcher's opinion, although has tried to account for the fullest possible delineation of the research questions, suffers from some drawbacks mentioned below.

First, it benefited from a post-test-only design. Such a design is favorable in that it helps the researcher not to give away the purpose of the treatment to the participants.

Despite this positive aspect, it functions similar to a two-edged sword i.e. meanwhile it conceals the purpose of treatment, it deprives the researcher of understanding the initial comparability of the participants that is the researcher will not know about any possible pre-existing differences among the participants which may function as a variable in research (Mackey & Gass, 2005). This lack of knowledge may hide some, or more than some, aspects of the participants and consequently the study from the eyes of the researcher. This puts some aspects of the study in darkness and requires some shedding of light by future researchers.

The next factor which requires some care in future research, and from which the present study suffers is related to the participants of the study. As mentioned earlier, the researcher had some discussions with the participants to convince them to take part in the study. Those who did not find the discussion cogent, as mentioned, were put aside of the final participants, but, unfortunately, the remaining participants were not inclined to be involved in tasks since their attitude to the tasks was critical and in some cases negative. This lack of a positive attitude could affect their performance and finally affect the results of the study. This is something that should be compensated for in future studies.

References

Akmajian, A., Demers, R. A., Farmers, A.K., & Harnish, R.M. (2010). *Linguistics: An Introduction to language and communication.* Massachusetts Institute of Technology.

Bachman, L. F. (2004). *Statistical analyses for language assessment.* Cambridge University Press.

Brown, H. D. (2002). *Strategies for success: A practical guide to learning English.* Pearson Education.

Brown, D. (2007). *Principles of language learning and teaching (5th ed.)*. Pearson.

Candlin, C., & Murphy, D. F. (1987). *Language learning tasks*. Prentice-Hall.

Chalak, A. (2015). The effect of task-based instruction on reading comprehension of Iranian EFL learners. *Applied Research on the English Language, 4*(1). 19-29.

Chastain, K. (1988). *Developing second language skills (3rd ed.).* Harcourt Brace Jovanovich.

Czajka, E. (2012). The influence of brain dominance on learning English pronunciation. *Acta Universitatis* Veratislaviensis, 3(4), 239-250.

Dornyei, Z. (2005). *The psychology of the language learner: Individual differences in second language acquisition.* Lawrence Erlbaum.

Dulger, O. (2012). Brain dominance and language learning strategy usage of Turkish EFL learners. *Cognitive Psychology, 5*, 1-23.

Ehrman, M., & Leaver, B. (2003). Cognitive styles in the service of language learning. *System, 31*, 393-415.

Ellis, R. (2003). *Task-based language learning and teaching.* Oxford University Press.

Fassold, R., & Connor-Linton, J. (2013). *An introduction to language and linguistics.* Cambridge University Press.

Fernandez, E. M., & Cairns, H. S. (2010). *Fundamentals of psycholinguistics.*Singapore: Wiley- Blackwell.

Field, J. (2004). *Psycholinguistics: The key concepts.* Routledge.

Fromkin, V., Rodman, R., & Hyams, N. (2014). *An introduction to language (10th ed.).* Wadsworth.

Hatch, E., & Lazaraton, A. (1991). *The research manual: Design and statistics for applied linguistics.* Heinle & Heinle Publishers.

Hudson, G. (2000). *Essential introductory linguistics.* Blackwell.

Kamalian, B., Soleimani, H., & Safari, M. (2017). The effect of task-based reading activities on vocabulary learning and retention of Iranian EFL learners. *The Journal of Asia TEFL. 14 (1),*32- 46.

Kordjazi, Z., & Ghonsooli, B. (2015). Brain dominance and test format: A case of vocabulary. *Journal of Language Teaching and Research,* 6(3), 695-703.

Larsen Freeman, D. (2000). *Techniques and principles in language teaching*. Oxford University Press.

Mackey, A., & Gass, S. M. (2005). *Second language research: Methodology and design.* Laurence Erlbaum Associates Publishers.

Nahavandi, N. (2011). The effect of task-based activities on EFL learners' reading comprehension. *Advances in Language and Literary Studies, 2* (1), 56-69

Nunan, D. (2003). *Practical English language teaching.* McGraw-Hill.

Piaget, J. (1955). *The language and thought of the child.* Meridian.

Richards, J. C., & Rodgers, T. S. (2001). *Approaches and methods in language teaching (2nd ed.).* Cambridge University Press.

Sanchez, A. (2004). The task-based approach in language teaching. *International Journal of English Studies, 4*(1), 39-71.

Skehan, P. (1998a). *A cognitive approach to language learning*. Oxford University Press.

Steinberg, D. D., & Sciarini, N. V. (2006). *An introduction to psycholinguistics (2nd ed.).* Pearson Education Limited.

Torrance, E. (1980). *Your style of learning and thinking, Forms B and C.* University of Georgia Press.

Willis, J. (1996). *A framework for task-based learning*. Longman.

Willis, J. (2012). *A framework for task-based learning*. Intrinsic Books E-books.

Wintergerst, A., DeCapua, A., & Itzen, R. (2001). The construct validity of one learning style instrument. *System*, 29, 395-403.