The effects of explicit and implicit teaching of connectors on the reading comprehension performance of Iranian EFL learners

Sepehr Safaie*

Abstract: Reading comprehension is considered a salient source of input and an important language skill in English as Foreign Language (EFL) learning contexts. Moreover, connectors are regarded as main constituents of reading materials. Connectors refer to linguistic devices which provide cohesion in texts and thus are highly likely to contribute to the reading comprehension process. Due to the importance of reading comprehension as a main language skill and the significance of connectors in the reading process, the present study set out to investigate the effects of explicit and implicit teaching of connectors on the reading comprehension performance of Iranian EFL learners. The participants were 60 Iranian male intermediate EFL learners studying in intact classes. The study adopted a pretest-posttest design and the data were collected through administering Preliminary English Test (PET) which included reading, listening, speaking, and writing. PET was initially used to make sure that the selected learners were homogenized in terms of overall language proficiency and reading comprehension performance. As for treatment, the explicit teaching group received a full explanation for connectors used in texts while the implicit teaching group was just exposed to examples of connectors in texts. The results showed that both explicit and implicit teaching of connectors were useful ways to improve reading comprehension. Moreover, it was found that explicit teaching of connectors was more useful than implicit instruction for enhancing reading comprehension.

ABOUT THE AUTHOR

Sepehr Safaie obtained his M.A degree in TEFL from Islamic Azad University Roudehen branch in Tehran, Iran. He has been teaching general English language courses for 30 years. His main areas of research interest include reading, vocabulary and grammar.

PUBLIC INTEREST STATEMENT

Reading comprehension is regarded as an important language skill. Therefore, it is highly important to make efforts in order to improve reading comprehension. Reading has many elements including vocabulary, grammar, etc. One of the categories of vocabulary which is related to grammar as well is connectors which provide a text with cohesion. Thus, focusing on connectors in teaching is likely to help learners improve their reading comprehension. In this study, two methods for teaching connectors including explicit and implicit instruction were tested. In explicit teaching, connectors were fully explained to the learners while in implicit teaching no direct explanation was used and learners were just exposed to examples of connectors in texts. The results showed that both explicit and implicit teaching of connectors were useful ways to improve reading comprehension. Moreover, it was found that explicit teaching of connectors was more useful than implicit instruction for enhancing reading comprehension.
The results of paired samples t-test indicated that explicit and implicit teaching of connectors were both significantly effective on reading comprehension performance. Moreover, the results of independent samples t-test revealed that explicit teaching of connectors had a significantly better effect on reading comprehension performance compared to implicit instruction.

Subjects: Theories of Learning; Classroom Practice; Language Teaching & Learning
Keywords: connectors; explicit teaching; implicit teaching; reading comprehension

1. Introduction

Reading comprehension is considered a major skill in the context of EFL since reading serves as a main source of input (Carrell, 1988). In the view of Hwang and Duke (2020), reading is a crucial language skill. They further maintain that effective support of reading comprehension in language learning entails developing a thorough understanding of the second-language reading comprehension development. Hwang and Duke (2020) assert that in order to understand the reading process, scholars should acknowledge the complexities involved in teaching and learning this important skill. Likewise, Elleman and Oslund (2019, p. 3) note that “reading comprehension is one of the most complex cognitive activities in which humans engage, making it difficult to teach”.

Due to the importance of reading comprehension, in language learning in general and second and foreign language learning in particular, reading has been subject to many recent studies (e.g., Afflerbach, Pearson & Paris, 2017; Brevik, 2019; R. Brown, 2017; Hwang & Duke, 2020; Israeli, 2017; Pearson & Cervetti, 2017).

Reading comprehension has so far been defined by many scholars. According to Brevik (2019), reading comprehension is a multidimensional and complex interaction between context, activity, reader, and text. In a similar fashion, Snow (2002) defines reading comprehension as a process through which the reader extracts and derives meaning simultaneously through engaging in interaction with written language. Snow (2002) maintains that the constituents of reading comprehension are the reader, the text and the activity in which comprehension is embedded. Urquhart and Weir (1998) characterize reading as a process through which information is received and interpreted by the individual. As Anderson (1999) states, in the reading comprehension process, the reader is an active participant in the interaction with the reading material.

As Grabe and Stoller (2002) note, L2 readers believe that becoming fluent readers in the target language is a challenging endeavor since reading comprehension process involves enormous complexity. In the view of Grabe and Stoller (2002), reading comprehension as a multi-layer and complex process involves multiple lower-and higher-level processing sub-skills. Thus, text comprehension requires that readers coordinate these skills effectively and in combination. Generally, English as a Second Language (ESL) and EFL learners grapple with abundant challenges during the process of reading comprehension as they do not adopt an interactive approach towards the whole written text (Carrell, 1988; Eskey, 1988; Grabe, 1988). To adopt an interactive approach towards text comprehension, learners need to have adequate knowledge of grammar and vocabulary as the main constituents of reading texts (Carrell, 1988). The results of previous studies substantiate the vital role of grammar in reading comprehension (e.g., Bentin et al., 1990; Bowey, 1986; Scarborough, 1991). For instance, based on Structural Deficit Hypothesis, learners’ reading difficulties mainly emanate from their syntactic processing deficiencies (Bentin et al., 1990). Based on Structural Deficit Hypothesis, low level of grammatical knowledge or poor processing ability renders text comprehension at higher processing levels very demanding. Furthermore, syntactic awareness assists learners in accomplishing reading comprehension tasks more effectively (Koda, 2005). As mentioned by Koda (2005), almost all challenges encountered by L2 readers in the reading comprehension process are due to insufficient linguistic knowledge. On the other hand, she also maintains that syntactic complexity is not the only constituent of the text contributing to effective reading comprehension. Thus, many studies (e.g., Anderson, 1999; Bentin et al., 1990;
Bowey, 1986; Koda, 2005; Scarborough, 1991) have also been carried out to examine the readers’ competence and strategies during the reading comprehension process. However, scant empirical studies have been conducted on the role of linguistic knowledge in L2 reading comprehension in general and the role of connectors in particular. Zeroing in on the contribution of connectors, Biber et al. (1998) conclude that connectors are used as a means to indicate the relationship between different units of discourse, including conjunctions such as coordinating conjunction (e.g., for, or, nor, so, or, for).

In various texts used for reading purposes in both general and EFL contexts, various types of connectors are employed to bring cohesion to text content. Dueraman (2007) defines cohesion as “how words and expressions are connected using cohesive devices which can be categorized into five groups: reference, substitution, ellipsis, conjunction, and lexical cohesion” (p. 5). As Kleijn et al. (2019) maintain, connectors help readers create a coherent mental representation displaying how text segments are related to one another. Connectors show the existence of a relation as well as the type of relation within text segments which contribute to text cohesion (Kleijn et al., 2019). The important role of connectors as a significant text feature contributing to reading comprehension has been explored by various researchers (e.g., Das & Taboada, 2017; Goldman & Murray, 1992; Haberlandt, 1982; Kleijn, 2018; Kleijn et al., 2019). As Ghasemi (2013) asserts “in fact, cohesion represents the presence of explicit cues in the text that allow readers/listeners to find semantic relations within it as part of linguistic system enhancing the semantic potentials of text” (p. 1616). Lexical and syntactic features create a meaning-based texture which facilitate text comprehension. Emphasizing the contribution of cohesion to the quality of text, Wang and Guo (2014) assert that cohesion has a pivotal role in discourse. A cohesive relation between two elements facilitates the integration of the elements into a text. Similarly, Goldman and Murray (1992) investigation revealed that connectors contribute to both text cohesion and comprehension. Previous empirical studies have also substantiated the relationship between knowledge of conjunctions as cohesive devices and reading comprehension. In a study, Stoodt (1970) concluded that the native fourth graders’ capability to identify the relationships reflected by conjunctions was directly related to reading comprehension. Some investigations (e.g., Chung, 2000; Degand et al., 1999; Loman & Mayer, 1983) have shown that conjunctions have a positive role in reading comprehension. As Lotfpour (2006) contends, connectors reflecting meaning relationship between two sections of a sentence not only shorten the computation time but also render the comprehension process less challenging.

Based on the results of previous investigations (e.g., Das & Taboada, 2017; Goldman & Murray, 1992; Haberlandt, 1982; Kleijn, 2018; Kleijn et al., 2019; Narita & Sugiuara, 2006; Quirk et al., 1985; A. Rahimi & Ghannadzadeh, 2010), connectors constitute an integral part of sentence structure as they enhance coherence in the whole structure of the text. Connectors are theoretically considered as the lexical items the writer or speaker employ to connect ideas, details, or clauses together to bring more clarity to meaning embedded in text (Ganger, 1998). Although previous studies have highlighted the crucial role of connectors in text comprehension, no study has so far compared the effects of explicit and implicit teaching of connectors on reading comprehension. Furthermore, a review of previous empirical studies (e.g., J. Alderson, 1984; J.C. Alderson, 2000; Nassaji, 2007; Shiotsu & Weir, 2007; Shiotsu & Weir, 2007; Urquhart & Weir, 1998) indicates that insufficient research has been carried out on the role of structural knowledge in L2 reading. This is likely to be attributable, in part, to the nature of reading which is viewed as a receptive language skill. Therefore, it was claimed that knowledge of the structure has a minor role in understanding a text compared to other components such as lexical items, background knowledge, and reading strategies (Shiotsu & Weir, 2007). Moreover, the contribution of grammar to language learning in general and L2 reading, in particular, has received less attention compared to lexicon (Han & D’Angelo, 2009).

Stern (1992) suggested that explicit teaching concerns with the provision of maximum explanation of rules and norms of the language on the side of the teacher. Therefore, in explicit teaching learners are provided with a high level of awareness with respect to the rules. On the contrary, in implicit
teaching learners are encouraged to reflect upon the language and make intuitions. He maintains that implicit teaching involves experiential approaches which emphasize learner’s attention through creating a receptive state of mind in the learner. In the view of Stern (1992), explicit teaching entails the application of conscious or overt strategies to teach learners through awareness-raisings. Based on Stern’s (1992) guidelines, explicit teaching is manifested in explanation, observation, trial-and-error, and monitoring. As Robinson (1995) asserts, explicit instruction is concerned with drawing learners’ attention to a particular learning objective in a highly structured setting. The teacher presents topics to students through demonstrating, explaining and practicing. Explicit instruction leads to more noticing which is necessary for changing input to intake (Schmidt, 1995). On the other hand, implicit instruction is famous for its authentic form of language instruction in which exposure is important and learners learn the language through discovery. According to Deitcher (2007, p. 11), implicit learning is the “acquisition of knowledge which occurs independently of conscious attempts to learn without explicit knowledge about what was acquired”. Supporting implicit instruction, Deitcher (2007) notes that language acquisition transpires naturally and without conscious attention. Results of previous studies have mainly revealed that explicit teaching is more effective compared to implicit teaching. Spada and Tomita (2010) conducted a meta-analysis on the effects of explicit and implicit teaching of grammatical features. They concluded that, in general, explicit teaching of grammar features is more effective than implicit teaching of grammar features. Similarly, in the area of vocabulary teaching, there are several studies corroborating the positive effect of explicit instruction (e.g., Coyne et al., 2007; Elleman et al., 2009; Maynard et al., 2010; Pollard-Durodola et al., 2011).

Boardman et al.’s (2017) results revealed that teachers’ advocate explicit teaching of reading strategies as explicit teaching of reading strategies leads to reading comprehension improvement. The results of Ballou’s (2012) study indicated that explicit teaching of reading strategies led to the improvement in students’ attitudes toward reading. Moreover, learners’ ability to use a wide variety of strategies increased after receiving explicit strategy instruction. The results of a study by Alamri and Rogers (2018) indicated that explicit instruction within the context of strategy development improved learners’ ability to notice vocabulary items leading to an increase in vocabulary intake. Hosseini et al. (2019) compared the effects of explicit and implicit teaching using literary and nonliterary materials on learner’s pragmatic comprehension and production. Their findings showed that explicit instruction led to better performance of the participants in terms of pragmatic knowledge. In another study, Ahmadian (2020) compared the effects of implicit and explicit instruction on learning refusal strategies in English. Their results indicated that explicit instruction was more effective than implicit instruction for both production and comprehension of refusals. Davatgari Asl and Moradinejad (2016) results indicated explicit instruction was positive on L2 learners’ use of discourse markers (DMs) in speaking. Likewise, E. Rahimi and Riasati (2012) results showed that explicit instruction of DMs led to the frequent use of DMs in participants’ oral production, compared to implicit teaching. Innajih’s (2007) findings revealed that explicit instruction of connectors at discourse level led to learners’ reading comprehension performance.

As a review of previous studies on explicit, implicit teaching (e.g., Ahmadian, 2020; Alamri & Rogers, 2018; Ballou, 2012; Boardman et al., 2017; Coyne et al., 2007; Davatgari Asl & Moradinejad, 2016; Elleman et al., 2009; Hosseini et al., 2019; Innajih, 2007; Maynard et al., 2010; Pollard-Durodola et al., 2011) and connectors and cohesive devices (e.g., Das & Taboada, 2017; Goldman & Murray, 1992; Haberlandt, 1982; Kleijn, 2018; Kleijn et al., 2019; Narita & Sugiura, 2006; Quirk et al., 1985; A. Rahimi & Ghannadzadeh, 2010) indicates, no study has so far attempted to examine the effects of explicit and implicit teaching of connectors on the reading comprehension performance of EFL learners. Thus, to fill the gap in the literature and in line with the purposes of the present study, the following research questions were formulated:

Q1) Does explicit teaching of connectors have any significant impact on the reading comprehension performance of Iranian intermediate EFL learners?
Q2) Does implicit teaching of connectors have any significant impact on the reading comprehension performance of Iranian intermediate EFL learners?

Q3) Is there any significant difference between the effects of explicit or implicit teaching of connectors on the reading comprehension performance of Iranian intermediate EFL learners?

Based on the above-mentioned research questions, the hereunder null hypotheses were raised:

**H01**: Explicit teaching of connectors does not have any significant impact on the reading comprehension performance of Iranian intermediate EFL learners.

**H02**: Implicit teaching of connectors does not have any significant impact on the reading comprehension performance of Iranian intermediate EFL learners.

**H03**: There is not any significant difference between the effects of explicit or implicit teaching of connectors on the reading comprehension performance of Iranian intermediate EFL learners.

2. Methodology

2.1. Design

The design of the current study was quasi-experimental since pure randomization was not feasible for the researcher. A quasi-experimental design is similar to an experimental design but lacks the elements of randomized selection. Moreover, in a quasi-experimental design participants are not randomly assigned to control or experimental groups (Mackey & Gass, 2005).

2.2. Participants

The participants of the current study were 60 Iranian male intermediate EFL learners studying in their intact classes. Non-random convenience sampling was used to select these participants due to manageability and availability reasons. To choose the participants of the study, the researcher talked with different intermediate classes in Shokouh’s language institute in Tehran and won the approval of two classes. Each class contained approximately 30 EFL learners at the intermediate level. The participants’ age ranged from 18 to 30. Initially, it deemed necessary to make sure that the two groups were not significantly different in terms of overall language proficiency. To do so, Preliminary English Test (PET) was administered to the two groups and an independent samples t-test was run to ensure that participants were homogeneous in terms of general language proficiency. The results of independent samples t-test revealed that there was no significant difference between the explicit and implicit groups in terms of PET scores.

2.3. Instrumentations and materials

To achieve the purposes of the current study, the following instruments and materials were utilized:

2.4. Preliminary English test (PET)

The PET developed by Quintana (2015) was used in this study to make sure that the two selected groups were not significantly different in terms of their overall language proficiency. It should be noted that although reading comprehension was the dependent variable in the current study, the researcher was methodologically inclined to make sure that the two groups were homogeneous in terms of overall language proficiency. The main reason for assuring homogeneity in terms of overall language proficiency was that if one of the groups had a significantly higher command of other skills, i.e., writing and speaking, prior to the main study, their outperformance on reading posttest could then be, in part, attributed to their better commands in other language skills and
not solely reading. The reason is that reading comprehension is interwoven with other language skills as well. Therefore, to control for as many factors as possible in terms of language performance, the researcher decided to assure that the two groups were homogeneous regarding their overall language proficiency. Moreover, the homogeneity of the two groups in terms of reading comprehension performance, prior to the main study, was also assured via appropriate statistical test.

To make sure that the test was appropriate for the purposes of the current study, it was piloted on 30 participants having similar characteristics to the target participants in this study and Cronbach’s Alpha was run on the obtained scores. The pilot study indicated that PET was a reliable test of language proficiency. The PET included three sections as follows:

- Reading and writing were taken together
- Listening
- Speaking—an interview

The tests of reading and writing section took together 90 minutes. The reading section had five parts with a total number of 35 questions showing that the test taker can read and understand the main points from signs, newspapers and magazines, and can use vocabulary and structure correctly. The writing section had seven questions. Five of the questions were fill-in-the-blank type with 5 marks. There were also two simple writing tasks. One of the writing tasks had 5 marks and the other 15. Therefore, the whole mark belonging to the reading and writing part was 60. The listening section had 25 questions each having one point. The speaking section had a total score of 15 points. Thus, the overall score for PET was 100. In order to rate the writing and speaking sections of the test, the writing and speaking scoring schemes of PET were used. Moreover, inter-rater reliability was established for the speaking and writing tests. To establish interrater reliability for the speaking and writing sections of PET, a rater assisted the researcher in assessing the speaking and writing performance of the participants. The interrater reliability indices for the speaking and writing sections turned out to be .83 and .88, respectively, which are considered satisfactory (J. D. Brown, 2007). To make sure that PET was reliable, in the context of the current study, it was piloted on 30 non-participants having characteristics similar to those of the actual participants. Next, PET underwent reliability analysis via applying Cronbach’s Alpha. Based on the results of Cronbach’s Alpha, PET had reliability indices of 0.76 and 0.84 for the reading and listening sections, respectively.

2.5. **The reading pretest and posttest**

The scores of the reading section of the PET used for homogeneity purposes were used as the reading pretest and a reading section from another version of the PET was used as the reading posttest. The reading tests each had five parts with a total number of 35 questions displaying test taker’s ability in reading and understanding the main points from signs, newspapers and magazines.

2.6. **List of the connectors**

The list of the connectors taught explicitly or implicitly in the current study was taken from Hyland (2005). The list contains connectors on four different categories including Sequencers, Topicalizers, Code glosses and Transitions as shown in Table 1.

2.7. **Reading materials**

The reading materials used in the present study were taken from the net. Each text had about 150 to 250 words and contained target connectors for each session. There were 10 texts in total with each two texts including one category of connectors, i.e., Sequencers, Topicalizers, Code glosses and Transitions. The main criterion for selecting the texts was the presence of connectors.
Moreover, to make sure that the texts were appropriate for the participants of the study, they were shown to two M.A. holders in TEFL with 15 years of teaching experience.

3. Procedure

3.1. Treatment in experimental group 1
Experimental group one received explicit teaching of connectors. Treatment in this group unfolded in line with Stern’s (1992) guidelines associated with explicit teaching. According to him, explicit instruction should include explanation, observation, trial-and-error, and monitoring. Concerning explanation, the connectors and how they are used were elaborated by the teacher. In this regard, efforts were made to talk about the connector types and ample examples were provided. The steps taken in line with Stern’s (1992) guidelines for the explanation phase were as follows:

(1) The connectors were written on the board.
(2) The learners were invited to guess what the connectors meant to them. Note should be taken that although the learners were at the intermediate level of proficiency and assuming they knew connectors and their meanings, it was still necessary to focus on their meaning to assure that learners knew them well. The reason behind this is that explicit teaching involves clarification via explanation. Moreover, this stage also helped get the learners engaged as a peripheral step for the next step which was explicit explanation.
(3) The teacher talked about the connector under instruction and gave details on how it should be used.
(4) The learners were asked to use the connector under focus in some sentences.
(5) The learners were put into pairs to compare the sentences they had composed in step four.
(6) The learners’ sentences were put on the board.
(7) The learners were asked to make a list of possible examples in the reading texts they had.

With respect to observation, in each session of the treatment learners were asked to use the connectors in some sentences. Learners were then required to give comments on the correctness of the sentences which they produced. The aim of the observation stage is to assist learners in becoming more observant of the form under instruction subsequent to explanation stage. Moreover, the observation stage should provide learners with assistance on how to use the information obtained from explanation stage to produce sentences. To put the observation stage into practice, the researcher followed these steps:

(1) He asked learners to come up with a hypothetical situation in which they could use the connectors under focus.
(2) Some learners were asked to write their sentences on the board.
(3) The other learners were invited to give comments on the sentences focusing on the connectors.

With respect to trial and error and monitoring, these steps were followed:

Table 1. List of connectors based on Hyland’s (2005)

| Sequencers               | Topicalizers          | Code glosses          | Transitions |
|-------------------------|-----------------------|-----------------------|-------------|
| First/second/third/...  | As for                | Especially            | Although    |
| Firstly/secondly/thirdly/... | Concerning X          | For example,           | As well     |
| Finally                  | In the case of X      | For instance,          | Because     |
| Last                     | Now                   | In other words         | Moreover    |
| Lastly                   | So                    | This means             | Therefore   |

1. Cogent Education (2020), 7: 1777806
https://doi.org/10.1080/2331186X.2020.1777806
Learners were required to keep a notebook specifically for the purpose of this study. They were asked to try to note down all the sentences containing the connectors that they saw in the reading texts. The learners were required to write a short report on how often they used the connectors and whether they had any problems using them every other session. Some of the learners were asked to read out their reports to the whole class. Learners were asked to give comments on the reports read by learners in step four.

3.2. Treatment in experimental group 2
Experimental group two received implicit teaching of connectors. In this group, exactly the same reading materials were used; however, the connectors were taught implicitly. In this method, in line with Nagy (1997), the teacher utilized an inferred method for teaching the connectors. To this end, the connectors were taught through mere exposure and no direct and explicit teaching was involved in the process. In other words, the learners in this group were just exposed to the connectors and mostly asked to see how they were used but no explicit rules or instruction were provided (Nagy, 1997). In this group, all instances of connectors were highlighted in the reading texts. In addition, the example sentences written on the whiteboard contained connectors to increase the amount of exposure learners received. It should be noted that there were no direct explanations about the connectors.

The whole duration of the treatment lasted 12 sessions. In the first session, the learners were given the PET including the reading comprehension pretest. Then, there were 10 sessions of treatment. In the last session, i.e., 12th session, the participants received the reading comprehension posttest the results of which were used to address the null hypotheses of the study.

4. Results

4.1. Participants' homogeneity in terms of reading comprehension
Students were checked for reading comprehension prior to the administration of treatment to make sure that they were homogeneous in terms of reading at the outset of the study. Table 2 demonstrates the descriptive statistics of the groups of the study in terms of reading pretest scores.

As indicated in Table 2, the explicit group had a mean score of 18.50 (SD = 3.10) and implicit group had a mean score of 18.63 (SD = 2.61). To make sure that the groups of the study were not significantly different in terms of reading proficiency, an independent samples t-test was run. Table 3 shows the results of independent samples t-test on the reading pretest scores of the explicit and implicit groups.

As seen in Table 3, Levene’s test of homogeneity indicated that the groups were homogeneous in terms of variances (P > 0.05). Accordingly, independent samples t-test could be safely used as an appropriate test. Table 3 demonstrates that the significant value of the independent samples t-test is higher than the critical value of 0.05 (t = 0.18, P = 0.85 for reading pretest), revealing that

| Groups       | N  | Mean | Std. deviation | Std. error mean |
|--------------|----|------|----------------|-----------------|
| Reading pretest |    |      |                |                 |
| Explicit     | 30 | 18.50| 3.104          | .566            |
| Implicit     | 30 | 18.63| 2.619          | .478            |
|                  | F     | Sig. | t     | df  | Sig. (2-tailed) | Mean difference | Std. error difference |
|------------------|-------|------|-------|-----|----------------|------------------|-----------------------|
| Reading pretest  | .706  | .404 | .180  | 58  | .858           | −.13             | .741                  |
| Equal variances assumed |       |      |       |     |                |                  |                       |
|                  | −.180 | 56.402 | .858 | −.13 | .741           |                  |                       |
| Equal variances not assumed |       |      |       |     |                |                  |                       |
there was no significant difference between the explicit and implicit groups in terms of reading pretest scores. Therefore, the groups of the study were homogeneous in terms of reading comprehension prior to the main study.

4.2. Research question 1
Before starting the main statistical analyses, the normality assumption for the data sets was checked. The results indicated that all the data sets enjoyed normal distribution; thus, parametric statistics were used to address the research questions. The first research question sought to explore the effect of explicit teaching of connectors on the reading comprehension performance of Iranian intermediate EFL learners. In order to address this research question, a paired samples t-test was run on the pretest and posttest reading scores of the explicit instruction group. Table 4 shows the descriptive statistics of the pretest and posttest reading scores for the explicit instruction group.

As seen in Table 4, the explicit instruction group had a mean score of 18.50 (SD = 3.10) on reading pretest and a mean score of 24.26 (SD = 3.76) on reading posttest. Table 5 presents the results of paired samples t-test on the reading pretest and posttest scores for the explicit instruction group.

As seen in Table 5, there was a significant difference between the pretest and posttest reading scores in the explicit instruction group (t = 9.67, P ≤ 0.05). Accordingly, it was concluded that explicit teaching of the connectors had a significant effect on the reading comprehension performance of Iranian intermediate EFL learners.

4.3. Research question 2
The second research question aimed to examine the effect of implicit teaching of connectors on the reading comprehension performance of Iranian intermediate EFL learners. To respond this research question, a paired samples t-test was run on the pretest and posttest reading scores of the implicit instruction group. Table 6 displays the descriptive statistics of the pretest and posttest reading scores for the explicit instruction group.

Table 4. Descriptive statistics of the reading pretest and posttest scores for the explicit instruction group

|           | Mean   | N    | Std. deviation | Std. error mean |
|-----------|--------|------|----------------|-----------------|
| Pair 1    |        |      |                |                 |
| Reading pre explicit | 18.500 | 30   | 3.104          | .566            |
| Reading post explicit | 24.266 | 30   | 3.768          | .688            |

Table 5. Results of paired samples T-test on the reading pretest and posttest scores for the explicit instruction group

|           | Mean    | Std. deviation | Std. error mean | t      | df    | Sig. (2-tailed) |
|-----------|---------|----------------|-----------------|-------|-------|----------------|
| Pair 1    | −5.766  | 3.266          | .596            | −9.670| 29    | .000           |
|           | Reading pre explicit — Reading post explicit |               |                 |       |       |                |
As seen in Table 6, the implicit instruction group had a mean score of 18.63 (SD = 2.61) on reading pretest and a mean score of 20.00 (SD = 2.87) on reading posttest. Table 7 shows the results of paired samples t-test on the pretest and posttest reading scores in the implicit instruction group.

Based on the output of paired samples t-test, there was a significant difference between the pretest and posttest scores in the implicit instruction group (t = 3.60, \(P \leq 0.05\)). Accordingly, it was concluded that implicit teaching of the connectors had a significant effect on the reading comprehension performance of Iranian intermediate EFL learners.

### 4.4. Research question 3

The third research question sought to discover any statistically significant difference between the effects of explicit and implicit teaching of connectors on Iranian intermediate EFL learners’ reading comprehension performance. To answer this research question, an independent samples t-test was run on the posttest reading comprehension performance of the two groups. Table 8 presents the descriptive statistics for the reading posttest scores of the two groups.

Based on the descriptive statistics in Table 8, explicit instruction group had a mean score of 24.26 (SD = 3.76) and implicit instruction group had a mean score of 20.00 (SD = 2.87) on reading posttest. Table 9 demonstrates the results of independent samples t-test on the reading posttest scores of the explicit and implicit groups.

Levene’s test of homogeneity indicated that the groups were homogeneous in terms of the variances (\(P > 0.05\)). Therefore, independent samples t-test could be safely used as an appropriate test for the reading posttest data. Results of independent samples t-test indicated that there was a significant difference between explicit and implicit instruction groups in terms of reading posttest scores (\(t = 4.92, P \leq 0.05\)). Accordingly, it was concluded that explicit teaching had a significantly better effect on the reading comprehension performance of Iranian intermediate EFL learners.

### 5. Discussion

The present study aimed at exploring the effects of explicit and implicit teaching of connectors on the reading comprehension performance of Iranian intermediate EFL learners. Two groups of EFL learners constituted the sample of the study. They were given a pretest to make sure that they were homogeneous in terms of overall language proficiency and reading comprehension performance at the outset of the study. One group received explicit instruction of connectors and the other group received implicit instruction of connectors. After the treatment period, students were given a posttest to examine the effects of the treatments on their reading comprehension performance. The results of statistical analyses indicated that explicit and implicit teaching were both effective in enhancing reading comprehension performance of Iranian intermediate EFL learners. Cross comparison between the groups indicated that explicit teaching of connectors was significantly more effective than implicit teaching of connectors in terms of its impact on reading comprehension performance.

The positive effectiveness of explicit and implicit teaching of connectors on reading comprehension performance is in congruence with the findings of previous empirical studies highlighting the
| Pair 1          | Reading pre implicit | Mean  | Std. deviation | Std. error mean | t     | df | Sig. (2-tailed) |
|-----------------|----------------------|-------|----------------|-----------------|-------|----|----------------|
| Reading post implicit |                     | −1.366 | 2.075          | 0.379           | −3.606 | 29 | 0.001          |
The theoretical justification for the contribution of connectors to reading comprehension lies in the relationship between connectors as important elements which facilitate the continuity of the text. As Lotfipour (2006) maintains, connectors can build texture and coherence among the messages, sentences and series of activities which positively affect learners’ reading comprehension. Similarly, Wang and Guo (2014) note that lexical and syntactic features available in the text create meaning-based texture, making it easier for grasping the message of the text. Emphasizing the contribution of cohesion to the quality of the text, Wang and Guo assert that cohesion has a pivotal role in discourse. Therefore, a cohesive relation between text elements facilitates the integration of the elements into a text which culminates in better text comprehension. Moreover, the use of connectors in text lowers the cognitive efforts learners need to establish a representation for the text content (Kleijn et al., 2019).

The results of the present study concerning the positive effect of explicit teaching of connectors on reading comprehension are in line with some previous investigations regarding the contribution of explicit teaching to language learning in general and reading comprehension in particular. For instance, Davatgari Asl and Moradinejad (2016) conducted a study to investigate the impact of explicit instruction on L2 learners’ use of DMs in speaking. The findings showed that the students in the experimental group had a better performance than those in the control group with respect to appropriate and frequent use of DMs. The same conclusion regarding the effectiveness of explicit instruction of connectors can be found in the study by Innajih (2007). Innajih (2007) examined the impact of explicit instruction of connectors at discourse level on the second-language learners’ reading comprehension. Innajih’s (2007) results revealed that explicit instruction of discourse markers had better results and learners receiving connectors at discourse level had better performance in reading comprehension compared to those in the control group. Moreover, Ballou’s (2012) research confirmed the positive effect of explicit teaching of reading strategies on learners’ improvement in terms of attitudes toward reading. Similarly, Alamri and Rogers (2018) found that explicit instruction of strategies enhanced learners’ vocabulary intake. Likewise, Davatgari Asl and Moradinejad (2016) showed that explicit instruction had a positive effect on L2 learners’ use of discourse markers (DMs) in speaking.
Table 9. Results of independent samples T-test on the reading posttest scores of the explicit and implicit instruction groups

|                          | F     | Sig. | t    | df  | Sig. (2-tailed) | Mean difference |
|--------------------------|-------|------|------|-----|-----------------|-----------------|
| Reading posttest         |       |      |      |     |                 |                 |
| Equal variances assumed  | 2.186 | .145 | 4.929| 58  | .000            | 4.26667         |
| Equal variances not      |       |      |      |     |                 |                 |
| assumed                  | 4.929 |      | 54.230| .000|                 | 4.26667         |
The findings of the current investigation also indicated that implicit teaching of connectors had a positive effect on reading comprehension performance. This finding is congruent with the theoretical foundations of implicit teaching as a type of instruction which focuses on exposure and naturalistic nature of language learning (Deitcher, 2007). Moreover, as Deitcher (2007) holds, implicit teaching enhances independent learning and leads to better acquisition. In fact, the main feature of implicit instruction is that it takes place naturalistically and spontaneously in line with the underpinnings of incidental language learning (Spada & Tomita, 2010).

The findings of the current study concerning the more significant effect of explicit teaching of connectors compared to implicit teaching on reading comprehension are consistent with the findings of some previous research. For instance, Spada and Tomita (2010), in their meta-analysis, revealed that the overall explicit teaching of grammar features was more effective than implicit teaching. Similarly, E. Rahimi and Riasati (2012) showed that explicit instruction of DMs enhanced the use of DMs in participants’ speaking, compared to implicit teaching. The better effect of explicit teaching compared to implicit teaching can be attributed to noticing. The main tenet underpinning explicit instruction is noticing which is a necessary condition for input to convert into intake (Schmidt, 1995). Robinson (1995), emphasizing the important role of noticing in learning, contends that noticing assists learners in both learning the materials under instruction and retaining them for subsequent use.

6. Conclusion
According to the obtained results of the present study, some pedagogical implications can be suggested for the Iranian context of foreign language learning. The current study outlines an approach to enhance L2 reading comprehension via knowledge of connectors grounded in empirical research. The first implication is that teaching connectors should be further emphasized in language classes generally and L2 reading lessons particularly. Additionally, it is strongly suggested that the instruction of connectors be explicit or include some explicit instruction at least. Similarly, more training on the instruction of connectors for pre-service and in-service L2 teachers seems beneficial. The above implications require attention by various people involved in the world of language teaching. For instance, materials developers and syllabus designers need to incorporate the instruction of connectors in an explicit fashion to improve reading comprehension performance.

In parallel, foreign language teachers need to be well prepared to handle connectors instruction in their classroom which puts further responsibility on the shoulder of teacher trainers and teacher education systems. In other words, proper teaching modules should be designed for training teachers on how best to teach connectors. Teachers need to get familiar with both explicit and implicit ways of teaching connectors and understand the difference between the two methods clearly. In addition to the immediate instructional modules for teachers, emphasis on the teaching of connectors in teaching reading comprehension courses at university level may also be valuable. Language teaching courses at university level mainly focus on general aspects of reading comprehension like models of reading and interaction in reading while more emphasis on other aspects of reading such as connectors at sentence, paragraph and discourse level can also be very revealing about the reading comprehension mechanism.

As it is true for almost all empirical studies, the results of the current study should not be taken as conclusive and more replication of this study is needed to reach firmer findings. Moreover, there are several drawbacks that need to be acknowledged and addressed with respect to the present study. The drawbacks described below may also be regarded as orientations for potential future L2 reading research. The first problem concerns the length of the study. To make stronger claims regarding the efficacy of explicit or explicit teaching of connectors on L2 reading comprehension, studies with longer duration and preferably longitudinal investigations are encouraged. This study just focused on participants with similar language proficiency and reading comprehension performance levels. In future, studies with participants having various levels of language proficiency and
reading comprehension performance can provide a more comprehensive and clearer picture. In this way, findings can enjoy more generalizability power too. Due to the focus of the current study and manageability reasons, the present study dealt solely with L2 reading. Language competence is not limited to reading skill and draws on various skills and competencies. Therefore, future studies investigating explicit or implicit teaching of connectors with respect to other aspects of language learning such as listening comprehension, speaking, and writing are recommended. Consequently, L2 practitioners can make firmer decisions regarding the integration of explicit or implicit teaching of connectors into a language curriculum. Finally, research on other reading components may provide invaluable results with respect to enhancing reading comprehension. For instance, explicit and implicit teaching of grammar and vocabulary can be other areas of research on L2 reading.

Funding
The author received no direct funding for this research.

Author details
Sepehr Safaie
E-mail: sepehr.safaie@yahoo.com
Department, Faculty of Persian Literature and Foreign Languages, Roudehen Branch, Islamic Azad University Roudehen, Roudehen, Iran.

Citation information
Cite this article as: The effects of explicit and implicit teaching of connectors on the reading comprehension performance of Iranian EFL learners, Cogent Education (2020), 7: 1777806.

References
Afflerbach, P., Pearson, P. D., & Paris, P. (2017). Skills and strategies: Their differences, their relationships, and why they matter. In K. Mokhtari (Ed.), Improving reading comprehension through metacognitive reading strategies instruction (pp. 33–50). Rowman and Littlefield.

Ahmadian, M. J. (2020). Explicit and implicit instruction of refusal strategies: Does working memory capacity play a role? Language Teaching Research, 24(2), 163–188. https://doi.org/10.1177/136216881783215

Alamri, K., & Rogers, V. (2018). The effectiveness of different explicit vocabulary-teaching strategies on learners’ retention of technical and academic words. The Language Learning Journal, 46(5), 622–633. https://doi.org/10.1080/09571736.2018.1503139

Alderson, J. (1984). Reading in a foreign language: A reading problem or a language problem? In J. Alderson & A. Urquhart (Eds.), Reading in a foreign language (pp. 1–27). Longman.

Alderson, J. C. (2000). Assessing reading. Cambridge University Press.

Anderson, P. (1999). Perspective: Complexity theory and organization science. Organization Science, 10(3), 216–232. https://doi.org/10.1287/orsc.103.216

Bolou, A. K. (2012). Using explicit strategy instruction to improve reading comprehension [Unpublished master’s dissertation]. St. John Fisher College.

Bentin, S., Deutsch, A., & Liberman, I. Y. (1990). Syntactic competence and reading ability in children. Journal of Experimental Child Psychology, 48(1), 147–172. https://doi.org/10.1016/0022-0965(90)90053-B

Biber, D., Conrad, S., & Reppen, R. (1998). Corpus linguistics investigating language structure and use. Cambridge University Press.

Boardman, A. G., Boele, A. L., & Klinger, J. K. (2017). Strategy Instruction Shifts Teacher and Student Interactions During Text-Based Discussions. Reading Research Quarterly, 53(2), 175–195.

Bowey, J. A. (1986). Syntactic awareness and verbal performance from preschool to fifth grade. Journal of Psycholinguistic Research, 15(4), 285–308. https://doi.org/10.1007/BF01067676

Bredek, L. M. (2019). Explicit reading strategy instruction or daily use of strategies? Studying the teaching of reading comprehension through naturalistic classroom observation in English L2. Reading and Writing, 32(9), 2281–2310. https://doi.org/10.1007/s11145-019-09951-w

Brown, J. D. (2007). Understanding research in second language learning: A teacher’s guide to statistics and research design. Cambridge University Press.

Brown, R. (2017). Comprehension strategies instruction for learners of English: Where we have been, where we are now, where we still might go. In S. E. Israeli (Ed.), Handbook of research on reading comprehension (pp. 543–567). The Guilford Press.

Carell, P. L. (1988). Interactive text processing: Implication for ESL/second language reading classrooms. In P. Carell, J. Devine, & D. Eskey (Eds.), Interactive approaches to second language reading (pp. 239–259). Cambridge University Press.

Chung, J. S. L. (2000). Signals and reading comprehension – Theory and practice. System, 28(2), 247–259. https://doi.org/10.1016/S0346-251X(00)00010-5

Coyne, M. D., McCoach, D. B., & Kapp, S. (2007). Vocabulary intervention for kindergarten students: Comparing extended instruction to embedded instruction and incidental exposure. Learning Disabilities Quarterly, 30(1), 74–88. https://doi.org/10.2307/30035543

Das, D., & Taboada, M. (2017). Signaling of coherence relations in discourse, beyond discourse markers. Discourse Processes, 55(8), 743–770. https://doi.org/10.1080/01638551X.2017.1379127

Davatgari Asl, H., & Moradinejad, A. (2016). The effect of explicit instruction of discourse markers on Iranian EFL learners’ speaking ability. Journal of Applied Linguistics and Language Research, 3(5), 190–202. http://www.jallr.com/index.php?JALLR/article/view/374

Degand, L., Lefevere, N., & Bestgen, Y. (1999). The impact of connectives and anaphoric expressions on expository discourse comprehension. Document Design, 1(1), 39–51. https://doi.org/10.1075/dd.1.1.06deg

Detcheverry, L. (2009). We are still as dreamers: The impact of the communal milieu on the place of Hebrew in Diaspora Jewish education. The Hebrew Language in the Era of Globalization, 31(1), 105–114.

Dueraman, B. (2007). Cohesion and coherence in English essays written by Malaysian and Thai medical students [Paper presentation]. Southern Thailand English Language Teaching/Cultural Change Conference, Bangkok: Thailand.
Ellerman, A. M., Lindo, E. J., Morphy, P., & Compton, D. L. (2009). The impact of vocabulary instruction on passage-level comprehension of school-age children: A meta-analysis. *Journal of Research on Educational Effectiveness, 2*(1), 1-44. https://doi.org/10.1080/19345740802539200

Ellerman, A. M., & Oslund, E. L. (2019). Reading comprehension research: Implications for practice and policy. *Policy Insights from the Behavioral and Brain Sciences, 6*(1), 3–11. https://doi.org/10.1177/237732218816339

Eskey, D. E. (1988). Holding in the bottom: An interactive approach to the language problems of second language readers. In P. L. Carrell, J. Devine, & D. Eskey (Eds.), *Interactive approaches to second language reading* (pp. 93–100). Cambridge University Press.

Ganger, J. B. (1998). *The Guilford Press.*

Grabe, W. (1988). Reassessing the term interactive. In Z. H. Han & N. J. Anderson (Eds.), *The Effect of Conjunctive Types on the Oral Output of ESL Essay Writing and Logical and Linguistic Intelligences.* Procedia Social and Behavioral Sciences, 5, 2012–2019. https://doi.org/10.1016/j.sbspro.2010.07.406

Haberman, K. (1982). Reader expectations in text composition. *The Guilford Press.*

Hosseini, M. B., Pourghasemian, H., & Lu, X. (2019). Comprehension effects of connectives across texts, readers, and coherence relations. *Discourse Processes, 56*(6), 447–464. https://doi.org/10.1080/0163853X.2019.1605257

Koda, K. (2003). *Insight into second language acquisition.* Pergamon.

Loman, N. L., & Mayer, R. E. (1983). Signaling techniques that increase the understandability of expository prose. *Journal of Educational Psychology, 73*(3), 402–412. https://doi.org/10.1037/0022-0663.73.3.402

Loftipour, S. K. (2006). Towards the textuality of a text: On a grammar for communication. Forouzesh Publications.

Mackey, A., & Gass, S. (2005). Second language research: Methodology and design. Lawrence Erlbaum Associates.

Maynard, K. L., Pullen, P. C., & Coyne, M. D. (2010). Teaching vocabulary to first-grade students through repeated shared storybook reading: A comparison of rich and basic instruction to incidental exposure. *Literacy Research and Instruction, 49*(3), 209–242. https://doi.org/10.1080/19388070902943245

Nagy, W. E. (1991). On the role of context in first- and second-language vocabulary learning. In N. S. C. E. (Ed.), *Vocabulary: Description, acquisition, pedagogy* (pp. 64–83). Cambridge University Press.

Narita, M., & Sugiuara, M. (2006). The use of adverbial connectors in argumentative essays by Japanese EFL college students. English Corpus Studies, 13(1), 23–42.

Nassaji, H. (2007). Schema theory and knowledge-based processes in second language reading comprehension: A need for alternative perspectives. *Language Learning, 57*(1), 79–113. https://doi.org/10.1111/j.1467-1770.2007.00413.x

Pearson, P. D., & Cervetti, G. N. (2017). The roots of reading comprehension instruction. In S. E. Israeli (Ed.), *Handbook of research on reading comprehension* (pp. 12–56). The Guilford Press.

Pollard-Durodola, S., Gonzalez, J., Simmons, D., Kwok, O., Taylor, A., Davis, M., & Simmons, L. (2011). The effects of an intensive shared book-reading intervention for preschool children at risk for vocabulary delay. *Exceptional Children, 77*(2), 161–183. https://doi.org/10.1177/001440291107700202

Quintana, J. (2015). PET practice tests. Cambridge: Cambridge University Press.

Quirk, R., Greenbaum, S., Leech, G., & Svartvik, J. (1985). A comprehensive grammar of the English language. Longman.

Rahimi, A., & Ghannadzadeh, J. A. (2010). Quantitative usage of logical connectors: in Iran’s EFL Essay writing and logical and linguistic intelligences. *Procedia Social and Behavioral Sciences, 5*, 2012–2019. https://doi.org/10.1016/j.sbspro.2010.07.406

Rahimi, E., & Riasati, J. (2012). The effect of explicit instruction of discourse markers on the quality of oral output. *International Journal of Applied Linguistics & English Literature, 11*(3), 67–79. http://www.journals.aic.org.au/index.php/IJALEL/article/view/693

Robinson, P. (1995). Review article: Attention, memory and the noticing hypothesis. *Language Learning, 45*(3), 238–331. https://doi.org/10.1111/j.1467-1770.1995.tb00461.x

Scarborough, H. S. (1991). Early syntactic development of dyslexic children. *Annals of Dyslexia, 41*(2), 207–220. https://doi.org/10.1007/BF02648087

Schmidt, R. W. (1995). Consciousness and foreign language learning: A tutorial on the role of attention.
and awareness in learning. In R. Schmidt (Ed.),
Attention and awareness in foreign language learning
(pp. 1–63). University of Hawaii, Second Language
Teaching & Curriculum Center.
Shiotsu, T., & Weir, C. J. (2007). The relative significance of
syntactic knowledge and vocabulary breadth in the
prediction of reading comprehension test
performance. Language Testing, 24(1), 99–128.
https://doi.org/10.1177/0265532207071513
Snow, C. (2002). Reading for understanding: Toward an
R&D program in reading comprehension. Rand.
Spada, N., & Tomita, Y. (2010). Interactions between type
of instruction and type of language feature: A
meta-analysis. Language Learning, 60(4), 263–308.
https://doi.org/10.1111/j.1467-9922.2010.00562.x
Stern, H. H. (1992). Issues and options in language
teaching. Oxford University Press.
Stoedt, B. D. (1970). The relationship between understanding
grammatical conjunctions and reading comprehension
(Project No. 2991). The Ohio State University.
Urquhart, S., & Weir, C. (1998). Reading in a second lan-
guage: Process, product and practice. Longman.
Wang, Y., & Guo, M. (2014). A short analysis of discourse
coherence. Journal of Language Teaching and
Research, 5(2), 460–465. https://doi.org/10.4304/jltr.
5.2.460-465