International Journal of Research Studies in Language Learning
2014 December Special Issue, Volume 3 Number 7, 15-27

The relationship between Iranian language learners' critical thinking ability and their reading comprehension achievement

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ISSN: 2243-7754
Online ISSN: 2243-7762

Received: 12 January 2014 **Revised**: 31 May 2014 **Accepted**: 1 June 2014 OPEN ACCESS
Available Online: 2 June 2014 **DOI**: 10.5861/ijrsll.2014.689

Abstract

The aim of the present study was to investigate the relationship between Iranian language learners' critical thinking ability and their reading comprehension achievement. To do so, two BA English classes from the faculty of letters and humanities of Shahid Beheshti University were selected as the participants of the study. They were given the Farsi version of Watson-Glaser Critical Thinking Appraisal and Academic IELTS reading test and the obtained data were analyzed through Pearson-Product moment Correlation Coefficient and doing a statistical regression analysis. The results revealed that there was a positive and moderately high correlation between the two variables of the present study and that the students' scores on the critical thinking test could predict their success or failure in the IELTS academic reading section. The findings of this study have some implications for educational policy makers, syllabus designers and EFL teachers to help them improve their academic, political and social lives.

Keywords: critical thinking; reading comprehension; EFL learners; Watson-Glaser critical thinking appraisal; correlation; regression analysis

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1. Introduction

The term "critical thinking" (CT) is not a new term in the literature. John Dewey was the first person who introduced the term "reflective thinking" in the early 20th century. Since then, this term has evolved to its contemporary alternative "critical thinking" as a result of the efforts of many scholars (e.g. Halpern, 1999; Lipman, 1991; Marzano et al, 2001; Norris & Ennis, 1989; Paul, 1990, and others) to define the term. In fact, we can consider the 1980s and 1990s as the heights of CT. The importance of critical thinking has been emphasized by many scholars. According to Paul (2004) educators should try to educate their students as critical thinkers. King (1992) has proven that being critical thinkers could help students to make the correct decision in reasoning, which would encourage Bloom's application stage. Based on the literature, it seems that the most prominent figure in the field of critical pedagogy (CP) who has worked a lot to advocate and encourage the incorporation of CT into education is Paul Freire. In his book, "Pedagogy of the Oppressed" (1970), he has put a special emphasis on students' ability to think critically about their education situation so that they would be able to recognize connections between their individual problems and experiences and the social contexts in which they are embedded. During the history of second language acquisition, many scholars have recognized the importance of reading comprehension. Among these, Krashen has made the most contribution by introducing the concept of "comprehensible input" in his theory of the "Natural Approach". He believes that reading plays a significant role in developing language acquisition.

2. Review of Literature

2.1 The History of the Emergence of Critical Thinking (CT) and Its Meaning

During the history of ELT several approaches to language teaching and learning have been introduced by many prominent figures in the field. Critical pedagogy(CP) which has critical thinking as its principle tenet is concerned with transforming relations of power which are oppressive and lead to the oppression of people (Kincheloe, 2005). In other words, humanizing and empowering learners is the main goal of CP and having a just society with its people enjoying political, economic and cultural control of their lives is its ultimate pursuit. Some of the earliest contributors to the field of critical thinking (called CT hereafter) can be traced back to Socrates, Plato, Aristotle, Descartes, Aquinas, Bacon, Dew, Piaget, Sumner, Marx, Glaser, and Bloom (Marzano et al., 2001). Although we can find many current names like Costa, Elder, Ennis, Lipman, and Swartz reviewing the literature, the Brazilian educator and activist Paul Freire can be considered as the most prominent figure of the field that used the principals of critical theory of the Frankfurt school as its main source and published his book named "Pedagogy of the oppressed". In his paper, Paul (2011) put the 1997 conference into a historical perspective and mentioned three waves for CT movement. In fact these three waves represent different research agendas and refer to different emphases in application of CT. For more information about these waves readers are referred to Paul's original paper.

2.2 What is CT? Definitions and controversies

One of the most comprehensive sources for CT's definitions is that of Pascarella and Terenzini (1991) who compiled several definitions for CT and presented an overall definition as follow:

> *critical thinking "typically involves the individual's ability to do some or all of the following: identify central issues and assumptions in an argument, recognize important relationships, make*

> *correct inferences from data, deduce conclusions from information or data provided, interpret whether conclusions are warranted on the basis of the data given, and evaluate evidence or authority* (p. 118).

Some scholars have mistakenly taken critical thinking for problem solving. According to Hedges (1991), however, these two can be set apart in that despite problem solving which is a linear process of evaluation, CT is a comprehensive set of abilities which allows the inquirer to move easily and smoothly through each stage of the linear problem-solving process and facilitate them.

2.3 Characteristics of Critical Thinkers

It seems that the most comprehensive list of critical thinkers' characteristics is that of Atkinson (1997). These characteristics are as follows:

- Truth-seeking. Critical thinkers seek truth, even if truth is inconsistent with closely-held beliefs.
- Open-mindedness. Critical thinkers value honest intellectual disagreement. There is strength in competition between a diversity of ideas.
- Analytical. Critical thinkers demand evidence for positions and consider the consequences of adopting any particular position for all affected parties.
- Systematic. Organizations and focus are necessary requirements for the process of developing, testing, adopting, and advocating new ideas.
- Self-confidence. As critical thinking skills grow, people tend to develop confidence in their ability to judge the merits of and choose between ideas.
- Inquisitive. Critical thinkers want to know. Ignorance is neither bliss nor desirable.
- Maturity. Critical thinking leads to wisdom born of personal experience and the experience of others (p. 156).

3. Relationships of CT to other Concepts

3.1 Metacognition

Kuhn (1999) believes that since CT consists of three kinds of knowing called metacognitive knowing (thinking operating on declarative knowledge), meta-strategic knowing (thinking operating on procedural knowledge) and epistemological knowing (including how knowledge is produced), it can be considered as a form of metacognition. Halonen (1995) also sees metacognition as the ability of a person to monitor his/her quality of CT.

3.2 Creativity

The relationship between CT and creativity has been well established in the literature. Paul and Elder (2006) mentioned that both CT and creativity are aspects of purposeful thinking. They also have famous quotation which says "CT without creativity reduces to mere skepticism and negativity and creativity without CT reduces to mere novelty" (p.35). In fact, they suggested the integration of CT and creativity during instruction. Seemingly, Bailin (2002) asserted that a certain amount of creativity is essential for critical thought.

3.3 Motivation

Scholars view CT as consisting of both skills and dispositions. The disposition dimension of CT is closely

related to motivation. Facione (2000) defined disposition as "consistent internal motivation to engage in problems and make decisions by using CT" (p. 65).

3.4 Constructivism

Accordingly, to Wadsworth (2004) all theories which consider people as builders of knowledge structure and not mere recorders of information can be subsumed under the heading of constructivism. Chaille (2008) contended that the role of the teacher is posing the challenges and supporting the students to encourage their cognitive construction. Brooks and Brooks (2005, as cited in Lunenburg, 2011) provided five principles of constructivist pedagogy in their book "In searching for understanding: the case for constructivist classroom" which are either directly or indirectly related to CT.

3.5 The Evolution of CT in a Person over Time

Researchers are not yet sure enough about the development of CT skills and dispositions over time. However, some researchers asserted that attending university might have an effect on the development of CT. Gellin (2003) conducted a meta-analysis of eight studies from 1991 to 2000 and came to this conclusion that those college students who had interaction with peers and faculty and lived on campus had a CT of 0.14 standard deviation higher than those students who didn't take part in such activities.

3.6 Is CT Teachable?

The review of literature reveals that to many of CT researchers CT skills are teachable. Abrami et al. (2008) have done a meta-analysis of 117 empirical studies aimed at examining the impact of instructional interventions on students' CT skills and dispositions and found that generally these instructions have a positive impact with a mean effect size of 0.34. Accordingly, a study conducted by Kennedy et al. (1991) showed that instructional interventions aimed at improving students' CT skills have a positive impact on improving these skills. Some strategies for teaching CT are explicit instruction, cooperative (or collaborative) learning, constructivist techniques, and modeling which are discussed fully in Paul (1992).

3.7 Why Are Students Reluctant to Think Critically?

Buskist and Irons (2008) explicate different reasons for which teachers and students feel reluctant to think critically some of which are listed as follows:

- The outcomes of reasoned decisions do not map onto their personal preferences.
- Some students are used to being told what to do and when to do it. This particularly applies to students who come from backgrounds in which other people (parents, teachers, coaches, and other authority figures) have made decisions for them.
- Having other people make decisions relieves students of responsibility.
- From a sociopolitical perspective, some students may think that their judgment is inferior to that of an authoritative figure.
- Some students are accustomed to learning the information by heart rather than thinking about it.
- Some students may undermine the consequences of their decisions.
- some students don't have time to allocate to genuine critical thinking.
- And finally, some students lack the basic topical knowledge needed for critical thinking. They simply do not have the academic background (they lack basic foundational knowledge) to understand, let

alone analyze, integrate, and apply the subject matter they are currently learning.

3.8 Assessment of CT

Several recommendations have been offered in the literature for designing ideal tests of CT. Ku (2009) suggested a combination of multiple-choice and open-ended items to better capture the construct of CT and to represent both the cognitive and dispositional aspects of CT. In this regard he stated the following:

> *Teachers should adopt different assessment methods, such as exercises that allow students to self-construct answers, assignments that facilitate the practice of strategic use of thinking skills in everyday contexts, and when adopting multiple-choice exercises, follow-up questions should be given to probe students' underlying reasoning* (p. 75).

4. The Delphi Study

The Delphi study was a qualitative research conducted by Facione in 1990. This study ran from February of 1988 until November of 1989 and consisted of six rounds of questions and response. The main finding of this study was that Critical thinking includes the dimensions of skill and disposition and that there was consensus that critical thinking could be improved in several ways. Based on this study, six sub-skills were identified for the skill (cognitive) dimension of CT. These six sub-skills are as follows: interpretation, analysis, evaluation, inference, explanation, and self- regulation. In a study conducted by Facione and his group of experts which led to the development of CCTDI (California Critical Thinking Disposition Inventory), they identified a set of attitudes for the disposition dimension of CT along with a set of skills and sub-skills for the skill dimension. Seven constructs related to the disposition dimension have been used in their test; these constructs were: Truth-Seeking, Open- mindedness, Analyticity, Systematicity, Self-confidence, Inquisitiveness, and Maturity (Facione, Facione et al. 2001).

4.1 General (Separate) Critical Thinking or Discipline-specific Critical Thinking

Although CT can be regarded as both a separate entity and a discipline-specific one, many scholars have advocated the contextually-bound use of CT due to its various advantages. Ennis recommended the subject-specific critical thinking for three reasons: First, background knowledge is necessary for making justified critical thinking judgments. Second, critical thinking varies from discipline to discipline and, third, a full understanding of a discipline requires the ability to think critically in the discipline (Ennis, 1990). Halliday (2000) also advocates the use of critical thinking in its various specific contexts.

4.2 Reading Comprehension

Reading has always been considered as one of the fundamental skills in TESL/TEFL. Contrary to the common belief which for a long time considered reading as a passive and receptive skill during which no apparent production is observed, nowadays, it is considered as an active and dynamic process in which the reader actively interacts with the text to reconstruct the meaning of it. In this view, Chastain (1988) contended that:

> *Traditionally, in the study of SL comprehension, the emphasis was on the language and not the comprehender or the reader; it was believed that the text has meaning and the reader receives it without himself actively involved in the process. Reading was called a 'receptive' skill but it seems that it isn't a good terminology for active, energy and time-consuming and the two-way communication* (Chastain, 1988, p. 216).

4.3 Models of Reading Comprehension

Some of the most well-known models of reading comprehension are discussed below.

Psycholinguistic model - This model, proposed by Goodman, is based on the concept of psycholinguistic guessing game which indicates that the reader goes through a cyclical process of reconstruction which consists of three steps of predicting, testing and confirming (or revising) his prediction to sample and getting the meaning.

The Schema Theory - Rumelhart (1984) defined schema as the organized knowledge that one has about people, objects, places events, processes, concepts and virtually everything that provides a basis for learning in memory and how these structures affect incoming information. In fact, the key tenet of the schema theory is the general pattern of the organization of knowledge in memory and the way these structures affect incoming information. The main difference between this theory and the psycholinguistic model is the highlighted role of background knowledge. In schema theory, the meaning does not reside in the text but this is the reader who constructs meaning from his background knowledge through a process called semantic constructivity. Chastain (1988) quotes Carrell and Eisterhold, who contended that meaning, is the result of interaction between the text and the reader's previously acquired knowledge and it doesn't reside in the written material.

Bottom-up Model - Alderson (2000) calls this a serial model in which the text is read sequentially and word by word and the reader comprehends the texts mostly by their language or linguistic knowledge. In fact, in this model, the reader moves from details to generals and as Erten and Karakas (2007) stated, readers need to analyze various linguistic elements to make sense of the writer's intended meaning.

Top-down Model - In 1960, Ausubel distinguished between meaningful learning and rote learning which later paved the way for top-down approach of L2 reading. Rote learning is what we see in behaviorism, i.e. memorization of words or rules of a new language mainly through repetition. Meaningful learning, on the other hand, is based on the concept of subsumption which states that new information is assimilated and incorporated into one's existing cognitive structure only when subsumed under relevant and inclusive existing conceptual system. In this model, the reader moves from generals to details.

4.4 Interactive Model

As time went on, researchers and scholars in the field came to this conclusion that neither the bottom-up nor the top-down model of reading can explain for what happens in the reading process. As a result, Rumelhart & Ortony (1977) suggested the interactive model to compromise between the two aforementioned models. In fact, they believed that a good reader is the one who possess both background knowledge and linguistic knowledge and can move both from generals to details and vice versa to gain reading comprehension.

4.5 CT and Reading Comprehension

Reviewing the literature, we will understand that the relationship between CT and reading comprehension is well established. Beck (1989) stated that "there is no reading without reasoning" (p. 677). Also, Waters (2006) contended that critical thinking activities can equip learners with instruments which help them "stay with" or "go beyond" the information presented in a text.

5. Research Methodology

5.1 Research questions

The present study was conducted to find an answer to the following questions:

- What is the relationship between Iranian language learners' critical thinking ability and their reading comprehension achievement?
- Can students' critical thinking ability predict their reading comprehension achievement?

5.2 Research Design

The basic design for correlational research is straightforward as figure 1:

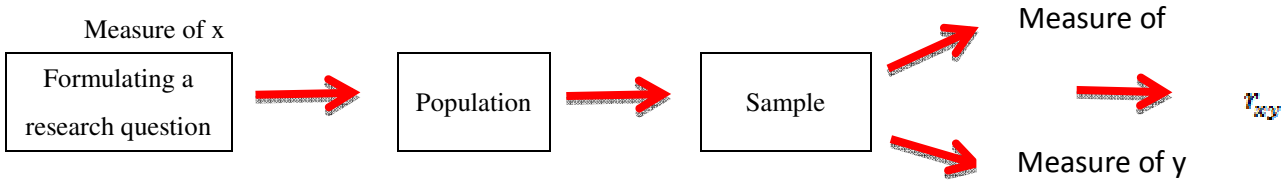

Figure 1. The basic design for correlational research

5.3 Research Setting and participants

The participants of the present study were chosen from among students studying English language literature in two classes at the faculty of literature and humanities, Shahid Beheshti University. The two classes were semester two and semester six classes. The demographic background of our participants' is as follows:

Table 1

Demographic background of the participants

No. of Participants	52
Gender	Both male and female
Age	19 – 25 years old
Nationality	Iranian
Mother tongue	Persian
Foreign language	English

5.4 Instruments

Two instruments were used in the present study:

1) The Farsi version of Watson-Glaser Critical Thinking Appraisal (WGCTA) Form A. During the history of CT researches, various general tests of CT have been used by several researchers. For the purpose of the present study WGCTA was used because it has been widely used by CT researchers (e.g. Fahim, Bagherkazemi ,& Alemi, 2010). This test comprises 80 items and is intended to measure some of the important abilities included in CT. The test is suitable for students of the 9th grade and above and consists of five subtests. Considering the reliability, according to the test manual it is reliable (The internal consistency and test-retest reliability: 0.81). Considering validity, the criterion-related validities (for studies reported in the manual) varied a great deal. However, Watson and Glaser stated that, criterion-related validity of .30 or better has a definite practical value. The researcher of the present study used the Farsi version of the appraisal, translated by Faravani (2006), of which the reported reliability is 85% (Cronbach's α=0.85). According to Faravani (2006), the Farsi version is culturally adapted to be suitable for use in Iran. The recommended time for finishing the test was 45 minutes which is its standard time.

2) IELTS academic reading tests. The three reading passages were selected from 3 different series of academic IELTS reading to lower the risk of students' previous encountering these tests. Considering the fact that some of these students had the experience of taking IELTS tests and some others were IELTS teachers, this strategy was deemed necessary by the researcher.

5.5 Data Collection Procedure

Due to the limitations of the present study like shortage of time, not enough available classes for distributing my instruments and so on, a type of nonprobability sampling called convenience sampling was used in this study.

Two BA classes of English Literature were non-randomly selected from the faculty of letters and humanities, Shahid Beheshti University.

Administering the IELTS - The IELTS test was administered in two weeks, one test at a time. The IELTS sample answer sheets were given to students to write down their answers. The participants were given one hour to complete the test which was the time limit suggested on the instruction page of the test.

Administrating WGCTA - Due to the research limitations like shortage of time and lack of enough classes for distributing and administrating WGCTA, students were given the questionnaire to complete at home. Of course, they were instructed properly how to complete the test (e.g. they were asked to complete them in 45 minutes). The test taking process lasted for two weeks.

5.6 Data analysis Procedure

In order to see whether there is a statistically significant relationship between the two variables, "Pearson Product Moment Coefficient of Correlation" was used after gathering the students' raw scores on the two tests. Sine IELTS reading score was from 40 and the CT test score was from 80, the researcher converted these scores to 100. A statistical regression was also conducted to see to what extent students' scores on CT test could predict their success in IELTS academic reading test.

6. Results

To answer the first question of the present study, the Pearson Product Moment correlation was used to investigate the correlation or go-togetherness of scores on CT with scores on academic reading section of the IELTS test. Table 2 demonstrates the significance of such correlation in class 2 (students in the second term).

Table 2

The relationship between CT and IELTS Academic Reading Test in Class 2

		IELTS	C.T
IELTS	Pearson Correlation	1	.722**
	Sig. (2-tailed)		.000
	N	24	24
C.T	Pearson Correlation	.722**	1
	Sig. (2-tailed)	.000	
	N	24	24

Note. Correlation is significant at the 0.01 level (2-tailed)

As is clear from the table above, the correlation coefficient for the two variables in question turned out to be 0.72 for class 2 which is significant at $p<0.01$. Since this correlation is moderately high and positive, we can conclude that the higher the EFL learners' CT is, the better achievers they will be in the IELTS reading comprehension section. The correlation coefficient for the two variables in class 6 (students in term 6) turned out to be 0.50 which although being much lower than that of class 2, is still significant at $p<0.01$. Table 2 shows whether such correlation is significant or not.

The same procedure was used to calculate the correlation coefficient for the two variables for all participants of the present study, i.e. all students in both class 2 and class 6. The correlation coefficient turned out to be 0.63 which is significant at $p<0.01$ (and also $p<0.05$). As observed in table 3, the correlation is again positive and moderately high. Therefore, it can be concluded that those learners who were better critical thinkers did a better job in IELTS reading comprehension section.

Table 3

The relationship between CT and IELTS Academic Reading Test in Class 6

		IELTS6.1	CT6.1
IELTS6.1	Pearson Correlation	1	.506**
	Sig. (2-tailed)		.006
	N	28	28
CT6.1	Pearson Correlation	.506**	1
	Sig. (2-tailed)	.006	
	N	28	28

Note. Correlation is significant at the 0.01 (2-tailed)

Table 4

The overall relationship between CT and IELTS Academic Reading Test

		IELTS	C.T
IELTS	Pearson Correlation	1	.632**
	Sig. (2-tailed)		.000
	N	52	52
C.T	Pearson Correlation	.632**	1
	Sig. (2-tailed)	.000	
	N	52	52

Note. Correlation is significant at the 0.01 (2-tailed)

To analyze the data further and to see whether students' scores on CT test could predict their success in IELTS reading section, regression analysis was conducted using SPSS (statistical package for social sciences). Table 4 indicates that the participants' total score of CT is a positive predictor of IELTS reading (the dependent variable).

Table 5

The results of regression analysis for EFL Learners' CT and their Success in IELTS Reading

		Unstandardized coefficients		Standardized coefficients		
Model		B	Std. error	Beta	t	Sig.
1	(Constant)	2.411	10.289		.234	.816
	C.T	.991	.172	.632	5.770	.000

Note. Dependent variable: IELTS

The model summary statistics is illustrated in table 5. According to the table, we can understand that the model containing the total score of CT test can predict 38% of the learners' success in IELTS reading section. The R value which is the correlation coefficient between the two variables is 0.63 and its squared value is 0.40. Thus, we can conclude that about 40% of the variation in EFL learners' success can be explained by taking their critical thinking ability into account.

Table 6

Model summary: R Square table for CT as the predictor of EFL Learners' IELTS Reading Success

Model	R	R square	Adjusted R square	Std. error of the estimate
1	.632[a]	.400	.388	12.96956

Note. Predictors: (Constant), C.T

7. Discussion and Conclusion

The primary concern of this study was whether there is a relationship between Iranian EFL students' CT ability and their reading comprehension achievement. Furthermore, this study tried to uncover to what extent students' performance on CT test could predict their success in IELTS reading comprehension section.

Having the similarity between the elements of CT and reading comprehension in mind, finding a positive correlation between these two variables was not far behind the expectation of the researcher of the present study. Considering our first research question which asked whether there is a relationship between students' critical thinking ability and their reading comprehension achievement, the result of the present study revealed that there was a relatively high and significant relationship between these two variables (r= 0.63). This finding suggests that those students who have a higher level of CT should logically perform better on IELTS reading section.

The second research question was "can students' critical thinking ability predict their reading comprehension achievement?" By conducting a statistical regression analysis using SPSS, the author came to this conclusion that the participants' total score is a positive predictor of IELTS reading. The result of the regression analysis showed that the model containing the total score of CT can predict 38% of the learners' success in IELTS reading section and 40% of the variation in EFL learners' success can be explained by taking their critical thinking ability into account. The findings of this study are in line with Fahim and Kamali's (2011) research which showed that there is a positive correlation between learners' CT ability and their performances on reading texts containing unfamiliar items. Also, Miller (1981) concluded in his study that students' gain in CT achievement was closely related to their reading proficiency achievement.

Yet, another study conducted by Sheikhi (2009) which attempted to investigate the relationship between autonomy, CT and reading comprehension of Iranian EFL learners revealed a positive correlation between CT and reading comprehension. Finally, Boloori (2010) reported a positive correlation between CT and inferential reading comprehension. In the end, it should be mentioned that the findings of the present study may have some implications for different stakeholders as follows:

7.1 Educational policy-makers:

Considering the fact that the world is yielding toward a democratic society, it is deemed essential for policy makers to give CT its due place in their general policies especially in their policies regarding education whether at school or university level.

7.2 Syllabus designers

If we cast a curious glance at the reading courses presented for BA students at our universities, we'll observe a special emphasis on language elements and skills while a very minor role is dedicated to CT skills. It seems the time has come for syllabus designers to consider a much more active and responsible role for both teachers and students in language classrooms if they want to avoid monotony which is equal to death.

7.3 Teachers

Third, in the phase of teaching and classroom's procedures, teachers should try to be creative enough to put the written concepts of CT into practice. Two ways of doing this might be problem posing and free discussions. The teacher might lead a problem and lead a discussion. Then, the students can be divided into groups to discuss the problems further and finally report the result of their discussion to the whole class. After that, the representative of each group must be able to defend his/her group's stand on the related issue or problem.

As another example, at the university level teachers had better focus more on the element of ideology tracking through advocating applying the principles of discourse analysis from the very beginning reading

courses. If all these stakeholders play their roles well in the tedious course of education, then seeing the light at the end of the tunnel especially in the developing countries will not be far reaching.

What's New?

Contrary to the other conducted research studies in the field of CT and reading comprehension concentrated merely on the relationship between the two variables, the present study tried to go beyond this level and give a practical dimension to the study by conducting a statistical regression analysis to see whether students' scores on the CT test can predict their success in the reading section of IELTS. In other word, the author wanted to show whether good critical thinkers are good readers or not. The result of course showed that there is a considerable percentage of predictability in this regard.

Acknowledgements: The author of the present study hereby declares that the present paper was derived from his MA thesis as a part of course requirement.

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