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The Relationship Between Cognitive Style of Impulsivity and Display, Referential, and Inferential Reading Comprehension Questions Among Iranian EFL University Students

LA RELATION ENTRE LE STYLE COGNITIF DE L'IMPULSIVITE ET L'AFFICHAGE, REFERENTIELLE ET INFERENTIELLE. DES QUESTIONS DE COMPREHENSION DE LECTURE CHEZ LES ETUDIANTS IRANIENS D'UNIVERSITE EFL

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Abstract

The present study was an attempt to study the relationship between cognitive style of impulsivity and performance of the intermediate EFL university students on display, referential and inferential reading comprehension questions. The participants in this study were 100 sophomore students. They were given a reading comprehension test battery containing six passages and Eysenck Impulsiveness questionnaire. The results revealed that there was no significant difference between Low, Medium and High impulsives with respect to their performance in Display, Referential, and Inferential reading comprehension questions.

Key words: Cognitive style; Impulsivity; EFL students; Reading comprehension questions

Résumé

La présente étude visait à étudier la relation entre le style cognitif de l'impulsivité et la performance des étudiants de niveau intermédiaire universitaires EFL sur l'écran, référentielles et inférentielles des questions de compréhension de lecture. Les participants à cette étude étaient de 100 élèves étudiant en deuxième année. Ils ont reçu une batterie de test de compréhension en lecture contenant six passages et le questionnaire d'Eysenck impulsivité. Les résultats ont révélé qu'il n'y avait pas de différence significative entre impulsives Low, Medium et High à l'égard de leurs performances en affichage, référentielle et inférentielle des questions de compréhension de lecture.

Mots clés: Style cognitif; Impulsivité; Etudiants d'EFL; Questions de compréhension de lecture

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INTRODUCTION

Reading, simply means, "extracting the required information from [text] as efficiently as possible" (Grellet, 1988, p.3)", or according to "the simple view of reading" (Grabe, 1997), it is, "most likely a simple multiplication of word recognition abilities and general language comprehension abilities" (Grabe, 1997, p.1). As a language skill, reading is viewed as one of the most important skills both in first language acquisition, in general, and second/ foreign language learning in particular.

One of the commonly known cognitive styles which has been recognized to be in relation with language learning process and performance in language skills is "Impulsivity- Reflectivity" or "conceptual tempo" (Kagan, 1966). This cognitive dimension refers to "either fast, spontaneous and unplanned, or slow, cautious and planned performance in cognitive tasks" (Male & Neubauer, 1991, p.865).

The investigation of the relationship between impulsivity cognitive style and reading comprehension in L1 and F/SL has attracted the attention of many researchers of the field (e.g. Piruznia, 1999; Salimi, 2001). However, Most of the recent studies which have focused on the relationship between Impulsivity cognitive style and reading comprehension have taken reading comprehension holistically (e.g. Piruznia, 1999; Salimi,

2001; Walczy and Hall, 1989), and have not attempted to analyze performance on different comprehension levels (see Aebersold & Field, 1998; Barnette, 1991). Regarding the studies on the relationship between Impulsivity cognitive style and reading comprehension, it can be stated that an analytic look at such a relationship has not yet well dug out.

Regarding the importance of this style in language learning in general and reading comprehension in particular, the present study tries to investigate whether there is any relationship between cognitive style of Impulsivity and performance on three types of reading comprehension tests including display, referential and inferential questions.

Research Hypotheses

1. Ho: There is no significant difference between high, medium, and low Impulsive Iranian intermediate EFL university students with regard to their performance on display reading comprehension questions.

2. Ho: There is no significant difference between high, medium, and low Impulsive Iranian intermediate EFL university students with respect to their performance on referential reading comprehension questions.

3. Ho: There is no significant difference between high, medium, and low Impulsive Iranian intermediate EFL university students regarding their performance on inferential reading comprehension questions.

1. BACKGROUND LITERATURE

1.1 Impulsivity and Learning

A crucial concern of educational researchers is the investigation of the relationship and effect of different external and internal factors on learning process and outcome. Among the internal factors, cognitive styles take a lion share of psychological variables in learning; for, they depict cognitive processing to a large extend, and also reveal the learners' performance of a particular style of learning and problem solving. One of the cognitive styles which is mostly related to problem-solving behaviors and has been identified by Kagan (1966) and some other researchers sequentially, is Impulsivity or "conceptual Tempo".

Kagan et al. (1966) found that in self-evaluation, the duration of time taken by non-impulsive children was longer than that of by the impulsive ones. They, consequently, concluded that since non-impulsives take longer time than impulsives do in self-evaluations, their self-description may be more accurate than and, therefore, with less error. However, non-impulsive subjects gave their answers to different inductive reasoning questions with delay in comparison with their impulsive counterparts because they were trying to avoid possible errors.

1.2 Impulsivity and Information Processing

Zelinker and Jeffrey (1976) state that non-impulsive children by attending to the detailed information of a stimulus, tend to process information analytically, while impulsives tend to process information globally by attending a stimulus as a whole. In an effort to test such a hypothesis, they conducted several studies. In an early study, it was found that non-impulsive children recalled significantly more detailed information from five sentences than their impulsive opponents. In another study, non-impulsive subjects showed up to be better off in analytic processing, while impulsive subjects were more globally oriented. In a later investigation, it was reported that impulsive children used a large number dimensions at the outset of encountering the problem but non-impulsives tried to focus on one dimension.

Loper and her colleagues (1982), however found that in a situation that children were reinforced for either analytic or global processing, both impulsive and non-impulsive subjects were capable of offering either a global or analytic hypothesis under appropriate reinforcement.

Kagan, Pearson, Welch (1966) revealed that non-impulsive children outperformed impulsives in inductive reasoning tasks. They concluded that non-impulsive persons could benefit more from inductive learning situations.

In another study, Palladino et al. (1997) investigated the relationship between impulsivity cognitive style, metacognitive functioning and depression in young adolescents. Impulsivity polarity of the subjects was determined by MFFT (Matching Familiar Figure Test), and metacognitive functioning was operationalized by metacognitive knowledge about reading and memory, and monitoring text comprehension. The results showed that impulsive subjects had gained significantly lower scores than nonimpulsives in monitoring text comprehension. However, no differences between the two groups were found in metacognitive knowledge.

To sum up, the findings in this realm announces that non-impulsives are more successful than impulsives in most aspects of information processing.

1.3 Impulsivity and Reading Comprehension

Most of the research on relationship between Impulsivity cognitive style and performance on language skills or components has focused on the perceptive skill of reading comprehension. This fact roots in the feasibility of investigation and the number of components and, hence, levels of processing which reading skill include.

Walczyk and Hall (1989) investigated the relationship between impulsivity and detection of contradiction in reading as a sign of comprehension monitoring. Through this study it was found that that failure to monitor comprehension was related to impulsiveness "but in part" (Walczyk & Hall, 1989). It was concluded based on the findings of the study that "[nonimpulsive] children

perform better at error detection in a passage, whereas impulsive children do not" (ibid. p.297). However, Walczyk and Hall mentioned that the failure in detecting contradiction cannot be restricted to impulsiveness, since the nonimpulsive learners did ignore the contradictions in some cases. Moreover, they contended that strategy training could lead impulsive children to improve their performance on such tasks.

In second language situation, Huda (1997) studied the relationship between speaking proficiency, learning strategies and impulsivity cognitive style. She reported that good learners tend to use fewer strategies than fair learners. However, she also claimed that her findings showed no clear pattern of relationship between impulsivity and use of learning strategies.

As a comprehensive study on the relationship between impulsivity and on performance on many linguistic skills (reading, vocabulary, grammar) in foreign language situation, Salimi (2001) studied the relationship between this cognitive style and performance of Iranian Ph. D candidates in TMU (Tarbiat Modarres University) general English proficiency test. He implemented Impulsiveness questionnaire (Eysenck & Pearson, 1985) to check the impulsivity status of the participants. Based on their score of the given questionnaire the subjects were divided into three groups of High, Medium and Low impulsive subjects. Overall results of the research indicated that Low Impulsive subjects outperformed High and Medium impulsives in all sections, but only in some sections the mean difference between them was significant. It was found that there is a significant difference between Low and High impulsives in Total and reading comprehension section.

Although findings of most of research projects mentioned here favor non-impulsiveness over impulsivity, the investigations did not enjoy the desired exactness and scrutiny in their look into language skills. Such a unitary viewpoint does not allow claiming assertively that impulsive subjects are always in disadvantage; In other words, simply similar to the work of Palladino et al. (1997) in information processing section which had defined information processing in different levels and aspects and then identified the performance of impulsive and non-impulsive subjects, if each skill is broken down into sub-skills and performance of the subjects are compared in each of the given subskills, the result will then appear to be more reliable.

2. METHOD

2.1 Participants

In order to accomplish this research project, one hundred BA English majors served as the subjects of the study. The participants were in the age range of 19 – 25. All participants were English students some majoring in English literature and others majoring in TEFL. They were taking up their fourth semester at Fersowsi University in Mashhad and Tarbiat Moallem University in Sabzevar. The subjects were selected only from fourth-semester students (late sophomores) in order to avoid possible significant heterogeneity of the samples in proficiency.

2.2 Instrumentation

2.2.1 Developed Reading Comprehension Test

First, seven passages were selected from Longman TOEFL preparation (1995) and nine items were developed for each passage, three Display, three Referential and three Inferential. The ration behind the choice of the given number of the passages and questions is heeding about a proper number of items (at least 21 items of each type) for parametric tests to be confidential. The items were selected from the ready-made test prepared by (Packdel, 2003), because the passages did not contain equal number of each type, and it was also validated with 240 subjects. Prior to the administration, the test was piloted on 34 students from fourth semester in Islamic Azad University of Mashhad .The pilot testing revealed that most students complained about the number of the passages (i.e., seven) and the questions (i.e., 63 items). Therefore it was decided to remove the last passage and to carry out the project with six passages and 54 items.

2.2.2 Impulsivity Subscale of Eysenck's Impulsiveness Questionnaire (I7) (IVE).

Eysenck's (1990) Impulsiveness Questionnaire contains 54 items and assesses Impulsiveness (19 items), venturesomeness (16 items) and Empathy (19 items). A Farsi version of this questionnaire was prepared by Salimi (2001), and its Impulsiveness subscale was also validated with 1820 subjects. The reliability of the Persian Impulsiveness subscale was tested using Cronbach's alpha and Spearman-Brown's unusual-length split half reliability. Alpha reliability was found to be 0.86 and split half reliability was found to be 0.86, which are acceptable indicators of reliability. The same Farsi version of impulsivity subscale serves the Impulsivity scale of the present research.

2.3 Procedure

Following the above pilot testing, the prepared reading test was administered to one hundred subjects majoring in English at Fersowsi University in Mashhad and Tarbiat Moallem University in Sabzevar who were in their fourth semester. The subjects were informed that no negative point would be conceived for their wrong responses. After the subjects were finished with the reading test, they took the prepared Persian Impulsiveness Subscale for which they were required to mark their answers on the questionnaire itself. The total time allocated for reading test is to be 65 minutes in each class and for impulsiveness subscale 10 to 15 minutes. The obtained results were entered into the SPSS 14.00 and EXCEL

2007 for analysis.

3. RESULTS & DISCUSSION

3.1 Descriptive Statistics

In order to show the distribution of data in all the cases and illustrate the frequencies in each case, table 1 and 2 below is a summary of descriptive statistics of the data related to the research hypotheses.

Table 1
Descriptive Statistics of the Questions and Impulsivity Scale

		Display	Referential	Inferential	Impulsivity
N	Valid	100	100	100	100
	Missing	0	0	0	0
Mean		13.4300	11.46	10.0000	52.6800
Std. Error of Mean		.20511	.226	.22473	.67687
Std. Deviation		2.05114	2.258	2.24733	6.76873
Variance		4.207	5.099	5.051	45.816
Range		12.00	11	11.00	35.00
Minimum		6.00	5	4.00	35.00
Maximum		18.00	16	15.00	70.00
Sum		1343.00	1146	1000.00	5268.00

Table 1 shows that although the test enjoys an equal number of questions of each type (i.e. 18 in each case) there is difference between the reported means of the given types. Performance in Display questions has been better than performance in the other two types, while Inferential questions were the least ones and the mean of Referentials falls between Displays and Inferentials. This outcome somehow confirms the claim of many language teaching and reading specialists as to the difficulty level of questions (e.g. Widdowson, 1979; Farhady, 1998; Talebinezhad, 1999; and Nuttal, 1996).

Since normality of distribution is a requirement of selecting and running parametric tests, we need to ascertain about the normality of distribution. Therefore, to check the normality of distribution, non-parametric test of one-sample K-S was run. The results are shown in table 2 below.

Table 2
One-Sample Kolmogorov-Smirnov Test for the Nature of Data Distribution

		Displays	Referentials	Inferentials	Impulsivity
N		100	100	100	100
Normal Parameters(a,b)	Mean	13.4300	11.46	10.0000	52.6800
	Std. Deviation	2.05114	2.258	2.24733	6.76873
Most Extreme Differences	Absolute	.179	.134	.118	.071
	Positive	.122	.070	.090	.071
	Negative	-.179	-.134	-.118	-.046
Kolmogorov-Smirnov Z		1.795	1.345	1.182	.711
Asymp. Sig. (2-tailed)		.003	.054	.122	.692

With reference to the last row of table 2, which represents the P values observed, data distribution is normal in all cases but Display questions because the observed P value in all cases but display questions is more than .05 probability level. The annormality of data distribution in the case of display questions warns us to be careful about our interpretation of the subjects here. Although the normality of distribution of display questions is not confirmed here, "ANOVA is said to be fairly robust in this regard" (Hatch and Lazaraton, 1998, p.328). The following tables report the results of ANOVAs.

3.2 Inferential Statistics: Hypotheses Testing

3.2.1 Investigation of Hypothesis 1

The first null hypothesis of the present research aimed at investigating the performance difference between High, Medium, and Low impulsive intermediate EFL students on Display reading comprehension questions.

Table 3
Descriptive Statistics of ANOVA for Display Questions

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Low	28	13.21	2.699	.510	12.16	14.26	6.00	17.00
		13.30	1.921	.293	12.71	13.89	7.00	18.00
Medium	43	13.82	1.440	.267	13.27	14.37	11.00	16.00
High	29							

Table 3 outlines that there is a very slight difference between the three groups in their performance in display questions although high impulsives have gained better scores.

Now the main table of ANOVA analysis should be deciphered to see if there is a significant difference between performances of the three groups.

Table 4
One-way ANOVA Analysis for Display Questions

	Sum Squares	df	Mean Square	F	Sig.
Between Groups	6.588	2	3.294	.779	.462
Within Groups	409.922	97	4226		
Total	416.510	99			

According to table 4 there is no significant difference between High, Medium and Low impulsive subjects regarding their performance in Display reading comprehension questions. Consequently, the first hypothesis of the research is confirmed on the ground that the observed P value exceeds the .05 probability level. Statistically speaking:

F (2, 97) = .779; P> 0.05

3.2.2 Investigation of Hypothesis 2

The second hypothesis of this study aims at assessing the relationship between the impulsivity level and performance in Referential reading comprehension questions. The results of one-way ANOVA for this subgroup of questions are sketched below.

Table 3
Descriptive Statistics of ANOVA for Display Questions

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Low	28	12.0000	2. 55314	.48250	11.0100	12.9900	5.00	16.00
			2.09651				6.00	15.00
Medium	43	11.5581		.3191	10.9129	12.2033	7.00	15.00
			2.09386	.3888				
High	29	10.7931			9.9966	11.5896		

Table 5 delineates that Low impulsive subjects outperformed High impulsives in that there are about 2 scores mean difference between the Low and High impulsive ones; however, the difference between Medium and Low impulsives, and somehow between Medium and High impulsives is not as noticeable as it is for the High and Low ones. So with regard to the appearance of such differences, it seems necessary to look into the outcome of ANOVA in table 6 for Referential questions.

Table 6
One-way ANOVA Analysis for Referential Questions

	Sum Squares	df	Mean Square	F	Sig.
Between Groups	21.477	2	10.738	2.155	.121
Within Groups	483.363	97	4.983		
Total	504.840	99			

Table 6 reads that there is no significant difference between the three groups regarding their performance in referential questions. Consequently, the second hypothesis of the study is corroborated on the absence of any significant difference. In other words:

F (2, 97) = 2.155; P>.05

3.2.3 Investigation of Hypothesis 3

The last hypothesis of the present study has targeted the absence or existence of difference between High, Medium and Low impulsives with respect to their performance on inferential questions.

Table 7
Descriptive Statistics of ANOVA for Inferential Questions

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Low	28	9.6786	2.89384	.54689	8.5565	10.8007	4.00	15.00
							4.00	14.00
Medium	43	10.2558	2.05974	.31411	9.6219	10.8897	6.00	13.00
High	29	9.9310	1.79147	.31411	9.2496	10.6125		

Table 7 outlines that there is a very slight difference between the three groups in their performance in referential questions although Medium impulsives have gained better scores. However, it is necessary to decide about the significance of difference based on the main table of ANOVA below.

Table 8
One-way ANOVA Analysis for Inferential Questions

	Sum Squares	df	Mean Square	F	Sig.
Between Groups	5.845	2	2.922	.576	.565
Within Groups	494.155	97	5.094		
Total	500.000	99			

According to Table 8, no significant difference is reported for the different performances of the three groups in inferential questions. Therefore, the last null hypothesis is vouched on the ground that the F Ratio didn't produce P value of less than .05. The ANOVA results for inferential questions can be stated statistically as follows:

F (2, 97) = .574; P> 0.05

3.3 Discussion

Results pertaining to the three research questions are discussed below. With regard to the first research hypothesis, there was no significant difference between high, medium and low impulsive subjects regarding their performance in display reading comprehension questions. This, in part, can be accounted for by the fact that display questions require a text driven, bottom-up approach to reading and answering this type of questions may only require focusing on linguistic forms at the level of words and sentences, checking only vocabulary and grammar. That is why in normal reading comprehension texts, the number of display questions in comparison with the other two types of questions is relatively low (Mahmoudi, 2002).

Another supporting point is that display questions appeared to be the easiest of all to answer and most of the subjects from all levels of impulsivity could perform more successfully. However, drawing upon these characteristics of both high and low impulsive subjects it can be said that in Display reading comprehension questions, high impulsives outperformed low and medium impulsives, although Salimi (2001) and Piruznia (1999) reported findings in favor of low impulsives.

The investigation of the second null hypothesis detected no significant difference between the three groups regarding their performance in referential questions; however, there was a "trend" in favor of low impulsives to outperform other groups, especially high ones. The discrepancy between high and low impulsives' performance in referential questions may be related to the fact that low impulsive learners tend to process information "until conceptual tempo is reached, whereas high impulsive learners cease processing prematurely even though the utility of further effort may still be high" (Brown 1994, p.216). It can be argued that referential questions require an understanding on the part of the readers as Farhady (1998) states, to make references to the preceding and following sentences in a text. In fact a higher level of processing is needed to answer referential questions in comparison with display questions.

Yet another evidence for the need of an effective strategy, in the case of referential questions, is the subjects' poor performance on the referential questions compared with that of display questions, as is shown in the descriptive statistics.

As for the third hypothesis, the results showed no significant difference performances of the three groups in inferential questions although there is "trend" in favor of medium impulsives. This outcome can be viewed in different ways:

Firstly, Bachman (1990) says that to answer reading comprehension questions involving inferences is not only a matter of linguistic knowledge but utilizing other sources of knowledge. The highly demanding nature of such questions is also revealed by descriptive statistics; the three groups performed poorly on inferential questions.

Secondly, answering inferential questions requires a lot of world knowledge (Farhady, 1998), and more importantly, a lot of reading practices in the target language. Widdowson (1979) regards inferencing as a high order processing that goes well beyond the text, and is closely related to the target language. It can be claimed that, as the results also demonstrate, there is no relationship between the three levels of impulsivity and this complex process that is inferencing which requires activating background knowledge.

CONCLUSION

The present study came to the following conclusions regarding the relationship and interaction between the variables investigated.

It was inferred that, first, increase in impulsivity level brought about decrease in achievement in Referential questions, but not Displays. In other words, Impulsivity and performance in Referential questions are somehow negatively correlated with each other.

Secondly, an analytic look at reading comprehension will produce much reliable results.

This study could, in fact, talk about the nature of questions and the level of information processing that they need. The study quite indirectly showed that the level of processing increase as the readers move from display questions to referential and inferential questions.

Drawing on the relationship between cognitive style of impulsivity and performance in reading comprehension, the teachers are recommended first, to incorporate all three types of questions in the class activities and ask all the

given types from any student, and second not to abruptly address the students' failure to their lack of knowledge; but he/she is suggested to take their cognitive styles and many other factors into account and then judge about their performance.

Implication

The results may also be of great value for syllabus designers, when preparing and designing reading materials, first to choose the passages so carefully that facilitate the developing of the most of the mentioned types of questions, second to incorporate all the three types of questions themselves, and third to provide activities of satisfactory variety which include the characteristics of all the three levels of Impulsivity in learners. In other words, they should take the learner into account at every stage of designing a syllabus, all the learners' affective, cognitive, and social factors. The course designers then can produce an integrated series of teaching and learning experiences.

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