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Language Learning Strategy Use; Does Critical Thinking Make a Difference?

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Abstract: The present study was an attempt to investigate the effect of critical thinking level on Iranian EFL learners' choice of language learning strategies. The participants were 93 male and female B.A. level Iranian students majoring in English language teaching and English translation at Imam Khomeini International University in Qazvin; Zanjan University; and Kar non-profit University in Qazvin. Data were collected using the Strategy Inventory for Language Learning (SILL), and Peter Honey's Critical Thinking Scale. The participants were divided into three levels (High, Mid, Low) of critical thinking based on their scores on the critical thinking questionnaire. The participants' strategy use in the three groups was compared using six separate one-way ANOVA procedures. The results showed that the level of critical thinking significantly influenced students' choice of memory, cognitive, metacognitive and social strategies, but had no significant effect on the choice of compensation and affective strategies. The findings of this study may have both theoretical and pedagogical implications for learners, teachers, and syllabus designers.

Keywords: Critical thinking; Language learning strategies; Strategy use.

1. Introduction

Scholars and researchers in second and foreign language learning are interested in determining the effect of strategy use on success in learning another language. Also, the vast literature on Language Learning Strategies (LLS) points to a number of factors believed to correlate with learners' use of LLSs either in ESL or EFL contexts. Recently, language teaching has witnessed a gradual shift from teacher-centered to learner-centered education. In line with this movement, instructional activities have gone across drastic changes, one of which is a need to provide opportunities for learners to think critically. Over the last 20 years, a number of educators and psychologists (e.g., Schafersman, 1991) have called for the inclusion of critical thinking skills in curriculum, since the major purpose of education is believed to be teaching learners how to think critically in order to be effective and competent citizens in the real world (Ido and Jones, 1991). Educational psychologists and researchers, such as (Thomas and Smoot, 1994), have advocated critical thinking as a very crucial element of schooling and pedagogy in the 21st century. Moreover, Atkinson (1997) asserts that critical thinking has been mostly used for first language education in the United States, but today its role in second and foreign language learning and teaching is of great significance, too. Thus, the present study aims to investigate the effect of critical thinking on the choice of language learning strategies and to answer the following questions:

1. Are there any significant differences among the effects of different levels of critical thinking on the choice of memory strategies?
2. Are there any significant differences among the effects of different levels of critical thinking on the choice of cognitive strategies?
3. Are there any significant differences among the effects of different levels of critical thinking on the choice of compensation strategies?
4. Are there any significant differences among the effects of different levels of critical thinking on the choice of meta-cognitive strategies?
5. Are there any significant differences among the effects of different levels of critical thinking on the choice of affective strategies?
6. Are there any significant differences among the effects of different levels of critical thinking on the choice of social strategies?

2. Literature Review

2.1. Language Learning Strategies

Over the last twenty years, there has been a burgeoning amount of research into language learning strategies, in an attempt to discover which of the language learning strategies that students use are the most effective for the particular type of language learning involved.

Many researchers and experts have defined language learning strategies from different points of view. [Bialystok \(1978\)](#) defines language learning strategies as “optional means for exploiting available information to improve competence in a second language” (p. 71). From a theoretical perspective, [Rignery \(1978\)](#) defines language learning strategies as techniques, steps, and behaviors, which language learners apply to facilitate language learning. [\(Tarone, 1983\)](#) defines language learning strategies as “an attempt to develop linguistic and sociolinguistic competence in the target language – to incorporate these into one's interlanguage competence” (p.67). There are various taxonomies of language learning strategies proposed by researchers. ([Bialystok, 1979](#); [Naiman et al., 1978](#); [Nisbet and Shucksmith, 1986](#); [O'Malley and Chamot, 1990](#); [Oxford, 1990](#); [Rubin, 1981](#); [Stern, 1992](#)). For instance, [Chamot and O'Malley \(1987\)](#) studied the use of learning strategies by ESL learners in the US. Based on his research, language learning strategies are divided into three main categories, metacognitive, cognitive, and socio-affective. According to [Oxford \(1990\)](#), language learning strategies fall in two main categories, direct and indirect strategies. Direct strategies are sub-divided into memory, cognitive and compensation strategies. Indirect strategies are further divided into metacognitive, affective, and social strategies.

2.2. Critical Thinking

The term ‘critical thinking’ has been the subject of much debate in recent years. Psychologists and language methodologists have difficulty offering a precise definition of critical thinking. That’s why [Halonon \(1995\)](#) states that “critical thinking scholarship is in a mystified state. No single definition of critical thinking is widely accepted” (p. 75). So, many definitions of critical thinking exist in the literature which seem to have areas of overlap.

[Norris and Ennis \(1989\)](#) define CT as “reasonable and reflective thinking that is focused upon deciding what to believe and do” (p.3). From another perspective, [Schafersman \(1991\)](#) describes it as the scientific method used by ordinary people in the ordinary world. [Jacobs et al. \(1997\)](#) define CT as “the repeated examination of problems, questions, issues, and situations by comparing, simplifying, and synthesizing information in an analytical, deliberative, evaluative, decisive way” (p. 20). In a similar vein, [Levy \(1997\)](#) defines critical thinking as “an active and systematic cognitive strategy to examine, evaluate, understand events, solve problems, and make decisions on the basis of sound reasoning and valid evidence” (p. 236). [Bensley \(1998\)](#) defines it as “reflective thinking involving the evaluation of evidence relevant to a claim so that a sound conclusion can be drawn from the evidence” (p.5). [Pithers and Soden \(2000\)](#) state that critical thinking includes a number of abilities such as identifying a problem and the assumptions on which it is based, focusing on the problem, analyzing, understanding and making use of inferences, inductive and deductive logic, and judging the validity and reliability of assumptions and sources of data. [Diestler \(2001\)](#) believes that critical thinking is the utilization of particular criteria to assess reasoning and making decisions. [Halpern \(2003\)](#) defines critical thinking as “the use of those cognitive skills or strategies that increase the probability of a desirable outcome....thinking that is purposeful, reasoned, and goal oriented” (p.6). For [MatDaud and Husin \(2004\)](#), CT basically “relates to one's conscious effort in deciding what to do or to believe by focusing one's thought on it” (p.479).

A number of researchers have shown interest in the field of critical thinking and language learning strategies. [Nikooour et al. \(2011\)](#) conducted a study to discover the relationship between critical thinking and language learning strategies among Iranian EFL learners. They found that cognitive, metacognitive, and social learning strategies had a relationship with critical thinking, while memory, compensation, and affective learning strategies had no relationship with critical thinking.

In another study, [Mall-Amiri and Ahmadi \(2014\)](#) explored the relationship between EFL learners’ critical thinking, and metacognitive strategies. The results showed a significant and positive relationship between EFL learners’ critical thinking and metacognitive strategies. Moreover, [Nosratinia et al. \(2014\)](#) investigated the relationship between EFL learners' language learning strategies and critical thinking. Running multiple regressions, they found that memory strategies, social strategies, metacognitive strategies, and compensation strategies were the best predictor of critical thinking.

Despite the above-mentioned studies, there seems to be a paucity of research as to whether and to what extent EFL learners’ level of critical thinking can influence their choice of language learning strategies. The present study aims to partially fill this gap.

3. Method

3.1. Participants

The participants of the present study initially included 118 male and female Iranian B.A. level students majoring in Teaching English and English Translation at Imam Khomeini International University; Zanjan University; and Kar non-profit University. The age of the participants ranged from 19 to 32. A general proficiency test (Michigan Test of English Language Proficiency, MTELP) was administered to homogenize the participants’ level of English language proficiency. After the administration of the MTELP and taking the results into account, the number of

participants was reduced to 93. 25 participants were excluded from the study because they had a different level of proficiency.

3.2. Instruments

The following instruments were used for the purpose of data collection:

A. Michigan Test of English Language Proficiency (MTELP): to homogenize the participants, the MTELP was administered. MTELP is one of the popular tests for measuring ESL or EFL learners' level of language proficiency. The 100-item multiple-choice test has three parts, containing 40 grammar items, 40 vocabulary items, and reading passages followed by 20 comprehension questions.

B. Oxford's Strategy Inventory for Language Learning (SILL): with 50 items on a 5-point Likert scale from 'Never' to 'Always'. The questionnaire comprises six categories:

- 1- Memory strategies which have nine items.
- 2- Cognitive strategies containing fourteen items.
- 3- Compensation strategies which included six items.
- 4- Meta-cognitive strategies including nine items.
- 5- Affective strategies which have six items.
- 6- Social strategies which included six items.

C. Peter Honey's Critical Thinking Scale: To study learners' critical thinking beliefs, a critical thinking questionnaire adapted from [Naieni \(2005\)](#) was employed. The scale was originally developed by [Honey \(2000\)](#). The questionnaire was improved and adapted for Iranian EFL learners. Moreover, the reliability of the scale was reported to be 0.86 ([Naieni, 2005](#)). The questionnaire consists of 30 items using a 5-point Likert scale. Students were asked to read items and select an option ranging from never to always depending on their critical thinking beliefs.

3.3. Procedure

To achieve the purpose of the study, the following procedure was followed. First, 118 participants with the afore-mentioned characteristics were selected. Next, the *Michigan Test of English Language proficiency* was given to the participants in order to homogenize them and make sure that there were no significant differences among the participants in terms of their proficiency level. They had 45 minutes to complete this test.

In the second stage, the strategy and critical thinking questionnaires were given to all the participants. The allotted time for completing these questionnaires was 40 minutes. During the administration of the questionnaires, if the participants had any question, the researcher would answer them. To homogenize the participants, their scores on the general proficiency test were summarized, and the mean and standard deviation were computed. The scores of those who had achieved more than one standard deviation away from (above or below) the mean were excluded from all subsequent analyses. The obtained data were summarized, analyzed and prepared for further statistical analyses.

3.4. Data Analysis

Having administered the tests and gathered the data, we employed six separate one-way ANOVA procedures to analyze the obtained data and to answer each of the research questions.

4. Results and Discussion

4.1. Investigation of the First Research Question

The first research question sought to see whether there are any significant differences among the effects of different levels of critical thinking on the choice of memory strategies. To this end, the participants were divided into three equal groups of high, medium, and low levels of critical thinking based their scores on the critical thinking questionnaire. A one-way ANOVA procedure was run to see the effect of the level of participants' critical thinking on their choice of memory strategies. [Table 1](#) shows the result of the descriptive and test statistics. Based on [Table 1](#), the high group has the highest mean ($\bar{X} = 19.42$), followed by the medium group ($\bar{X} = 17.55$), and the low group ($\bar{X} = 16.23$). Moreover, the F-value is significant ($F(2, 90) = 4.34, p > .05$). This means that there are significant differences among the three critical thinking groups in the choice of memory strategies. Meanwhile, the index of the strength of association ($\omega^2 = 0.06$) shows that 6% of the total variance in the dependent variable (memory strategy use) is accounted for by the independent variable (critical thinking). This means that the remaining 94% is left unaccounted for.

Table-1. Descriptive and Test Statistics for the ANOVA on Critical Thinking and Memory Strategies

	Critical Thinking	N	Mean	Std. Deviation	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
Memory Strategies	High	31	19.42	4.588	17.74	21.10
	Mid	31	17.55	4.081	16.05	19.05
	Low	31	16.23	4.169	14.70	17.76

F= 4.34 Sig. = .016 $\omega^2 = 0.06$

To locate the differences among the three groups, the post hoc Scheffe test procedure was used, yielding the following results:

Table -2. Post Hoc Multiple Comparisons for Critical Thinking Level in the Choice of Memory Strategies

(I) Critical Thinking	(J) Critical Thinking	Mean Difference (I-J)	Sig.	95% Confidence Interval	
				Lower Bound	Upper Bound
High	Mid	1.871	.234	-.84	4.58
	Low	3.194*	.016	.48	5.90
Mid	Low	1.323	.481	-1.39	4.03

*. The mean difference is significant at the 0.05 level.

Table 2 shows that only the difference between the high group and the low group means is statistically significant.

4.2. Investigation of the Second Research Question

To investigate the effect of critical thinking level on the choice of cognitive strategies, the second ANOVA was run. Table 3 shows the result of the descriptive and test statistics. Based on Table 3, the high group has the highest mean ($\bar{X} = 36.03$), followed by the medium group ($\bar{X} = 30.84$), and the low group ($\bar{X} = 30.16$). Moreover, the F-value is significant ($F(2, 90) = 9.22, p < .05$). So, the differences among the three critical thinking groups in the choice of cognitive strategies are significant. Meanwhile, the index of the strength of association ($\omega^2 = 0.15$) shows that 15% of the total variance in the dependent variable (cognitive strategy use) is accounted for by the independent variable (critical thinking).

Table-3. Descriptive and Test Statistics for the ANOVA on Critical Thinking and Cognitive Strategies

	Critical Thinking	N	Mean	Std. Deviation	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
Cognitive Strategies	High	31	36.03	6.580	33.62	38.45
	Mid	31	30.84	5.675	28.76	32.92
	Low	31	30.16	5.336	28.20	32.12

F= 9.22 Sig. = .000 $\omega^2 = 0.15$

To locate the differences among the three groups, the post hoc Scheffe test procedure was used, showing the following results:

Table -4. Post Hoc Multiple Comparisons of Critical Thinking Level in the Choice of Cognitive Strategies

(I) Critical Thinking	(J) Critical Thinking	Mean Difference (I-J)	Sig.	95% Confidence Interval	
				Lower Bound	Upper Bound
High	Mid	5.194*	.003	1.47	8.92
	Low	5.871*	.001	2.15	9.59
Mid	Low	.677	.903	-3.04	4.40

*. The mean difference is significant at the 0.05 level.

Table 4 shows that the difference between the high and the medium groups is statistically significant, and so is the difference between the high and low group means. However, the difference between the means of the medium and low groups is statistically insignificant.

4.3. Investigation of the Third Research Question

The third ANOVA was used to investigate the effect of critical thinking level on the choice of compensation strategies. Table 5 presents the result of the descriptive and test statistics. Based on Table 5, the high group has the highest mean ($\bar{X} = 14.03$), followed by the low group ($\bar{X} = 12.65$), and the medium group ($\bar{X} = 12.26$). However, the F-value is insignificant ($F(2, 90) = 2.00, p > .05$). Therefore, the differences among the three critical thinking groups in the choice of compensation strategies are not significant.

Table-5. Descriptive and Test Statistics for the ANOVA on Critical Thinking and Compensation Strategies

	Critical Thinking	N	Mean	Std. Deviation	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
Compensation Strategies	High	31	14.03	4.021	12.56	15.51
	Mid	31	12.26	2.594	11.31	13.21
	Low	31	12.65	4.176	11.11	14.18

F= 2.00 Sig. = .140

4.4. Investigation of the Fourth Research Question

To see the effect of critical thinking level on the choice of meta-cognitive strategies, the fourth ANOVA was run. Table 6 contains the result of the descriptive and test statistics. Based on Table 6, the high group has the highest mean ($\bar{X} = 26.87$), followed by the low group ($\bar{X} = 21.87$), and the medium group ($\bar{X} = 21.19$). Moreover, the F-value is significant ($F(2, 90) = 8.96, p < .05$). The findings indicate that there are significant differences among the three critical thinking groups in the choice of meta-cognitive strategies. Meanwhile, the index of the strength of association ($\omega^2 = 0.14$) shows that 14% of the total variance in the dependent variable (metacognitive strategy use) is accounted for by the independent variable (critical thinking). This means that the remaining 86% is left unaccounted for.

Table-6. Descriptive and Test Statistics for the ANOVA on Critical Thinking and Metacognitive Strategies

	Critical Thinking	N	Mean	Std. Deviation	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
Metacognitive Strategies	High	31	26.87	4.500	25.22	28.52
	Mid	31	21.19	6.258	18.90	23.49
	Low	31	21.87	6.355	19.54	24.20

F= 8.96 Sig. = .000 $\omega^2 = 0.14$

To locate the differences among the three groups, the post hoc Scheffe test procedure was used, showing the following results:

Table-7. Post Hoc Multiple Comparisons for Critical Thinking Level in the Choice of Metacognitive Strategies

(I) Critical Thinking	(J) Critical Thinking	Mean Difference (I-J)	Sig.	95% Confidence Interval	
				Lower Bound	Upper Bound
High	Mid	5.677*	.001	2.03	9.32
	Low	5.000*	.004	1.35	8.65
	Low	-.677	.899	-4.32	2.97

*. The mean difference is significant at the 0.05 level.

Table 7 shows that the mean difference between the high and medium groups is statistically significant, and so is the difference between the means of the high and low groups. However, the difference between the medium and low groups is statistically insignificant.

4.5. Investigation of the Fifth Research Question

The fifth ANOVA was conducted to see the effect of critical thinking level on the choice of affective strategies. Table 8 shows the result of the descriptive and test statistics. Based on Table 8, the F-value is insignificant ($F(2, 90) = 3.64, p > .05$). These findings indicate that there are no significant differences among the three critical thinking groups in the choice of memory strategies.

Table-8. Descriptive and Test Statistics for the ANOVA on Critical Thinking and Affective Strategies

	Critical Thinking	N	Mean	Std. Deviation	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
Affective Strategies	High	31	12.06	4.049	10.58	13.55
	Mid	31	9.71	4.189	8.17	11.25
	Low	31	9.52	4.170	7.99	11.05

F= 3.64 Sig. = .30

4.6. Investigation of the Six Research Question

Finally, the sixth ANOVA was run to investigate the effect of critical thinking level on the choice of social strategies. Table 9 contains the result of the descriptive and test statistics. Based on Table 9, the F-value and the significance level ($F_{(2, 90)} = 5.83$, $p < .05$) suggest that the differences among the three critical thinking groups in the choice of social strategies are statistically significant. Meanwhile, the index of the strength of association ($\omega^2 = 0.09$) shows that 9% of the total variance in the dependent variable (social strategy use) is accounted for by the independent variable (critical thinking).

Table-9. Descriptive and Test Statistics for the ANOVA on Critical Thinking and Social Strategies

	Critical Thinking	N	Mean	Std. Deviation	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
Social Strategies	High	31	14.81	3.825	13.40	16.21
	Mid	31	13.48	4.146	11.96	15.00
	Low	31	11.19	4.629	9.50	12.89

F= 5.83 Sig. = .004 $\omega^2 = 0.09$

To locate the differences among the three groups, the post hoc Scheffe test procedure was used, showing the following results:

Table-10. Post Hoc Multiple Comparisons for Critical Thinking Level in the Choice of Social Strategies

(I) Critical Thinking	(J) Critical Thinking	Mean Difference (I-J)	Sig.	95% Confidence Interval	
				Lower Bound	Upper Bound
High	Mid	1.323	.469	-1.34	3.99
	Low	3.613*	.005	.95	6.28
Mid	Low	2.290	.107	-.37	4.95

*. The mean difference is significant at the 0.05 level.

Table 10 shows that only the difference between the high and the low groups is statistically significant.

4.7. Discussion

One of the findings of the present study was that critical thinking significantly influenced the use of memory, cognitive, meta-cognitive and social strategies. This result lends support to some previous studies (e.g., (Mall-Amiri and Ahmadi, 2014; Nikoopour *et al.*, 2011; Nosratinia *et al.*, 2014; Zarei and Gilanian, 2014). Nikoopour *et al.* (2011) study reported a statistically significant correlation between language learning strategies and critical thinking. They found that cognitive, metacognitive, and social strategies had a relationship with critical thinking. Moreover, Mall-Amiri and Ahmadi (2014) findings showed a significant and positive relationship between EFL learners' critical thinking and metacognitive strategies. Also, Nosratinia *et al.* (2014) investigated the relationship between EFL learners' language learning strategies and critical thinking. They reported that memory, social, and metacognitive strategies were the best predictors of critical thinking. Similarly, Zarei and Gilanian (2014) found that cognitive and social strategies were the best predictors of critical thinking.

In addition, these findings partially support those of Hosseini *et al.* (2012), who showed a positive relationship between EFL readers' critical thinking ability and metacognitive and cognitive reading strategy use.

The results of the present study are also compatible with some non-L2 studies that explain the connection between metacognition and critical thinking (Halpern, 1998; Nickerson, 1994). Also, the results are in line with those of Magno (2010), suggesting that the factors of metacognition are significantly related to the factors of critical thinking. The findings also accord with those of Choy and Cheah (2009), who reported a positive correlation between metacognition and critical thinking.

At the same time, the findings of the present study contradict a number of previous studies. The findings of this study are to some extent different from those of Nikoopour *et al.* (2011), who found no relationship between memory strategies and critical thinking. The results also contradict some aspects of Zarei and Gilanian (2014)

findings, which showed that compensation and affective learning strategies were significant predictors of critical thinking.

The similarities and differences between the results of the present study and those of the above-mentioned studies might be partially attributed to the following factors.

The first possible factor contributing to these findings may be learners' level of proficiency. The present study only focused on B.A. level students majoring in translation and TEFL who were roughly at intermediate level of proficiency. Several previous studies such as Peacock and Ho (2003), Anderson (2002), Rahimi *et al.* (2008) and Pannak and Chiramanee (2011) have shown that a high level of proficiency is associated with an increased use of both direct and indirect strategies.

Another possible factor can be gender differences. In the present study, gender differences were not taken into account, but previous studies on language learning strategies like Oxford (1990), Wharton (2000), Bozinovic and Sindik (2011), and Zeynali (2012) have emphasized gender differences among the participants in the choice language learning strategies. Also with regard to critical thinking, although, some studies show that gender cannot predict individuals' critical thinking skills, it is suggested that women sometimes feel that critical thinking "is synonymous with 'male logic', a thought process they find adversarial uncomfortable, and alienating" (Browne *et al.*, 1989). It has also been found that men are more analytical than women (Facione *et al.*, 1994) and generally score higher in critical thinking skill tests (Leach and Good, 2011). So, gender may be a potential factor for the existing differences between the results of the present study and those of previous ones.

Socio-cultural differences could be another reason for differences between the results of the present study and the above studies. For instance, O'Malley and Chamot (1990) found that Asian students prefer to use strategies involving rote memorization and language rules. At the same time, as the participants of the present study were Iranian learners, they seem to have fewer opportunities to raise their awareness of affective learning strategies and gain better control over emotions, attitudes and motivations related to language learning.

5. Conclusion

The present study attempted to investigate the effect of critical thinking on the choice of memory, cognitive, compensation, meta-cognitive, affective and social strategies of Iranian EFL learners. The results showed that the level of critical thinking significantly influenced students' choice of memory, cognitive, meta-cognitive and social strategies, but had no significant effect on the choice of compensation and affective strategies. In this regard, strategy training and helping learners improve their critical thinking may have a mutual positive effect, and hence boost EFL learning. Meanwhile, the findings of the present study may have implications for learners, teachers, and materials developers. Learners should be given more opportunities to develop their critical thinking in the process of language learning. Moreover, teachers are recommended to create an educational environment in which learners' critical thinking skills can be encouraged and nourished in the classroom. This way, teachers can find new and better ways of introducing learning strategies to the students. In addition, materials developers are suggested to plan a curriculum which includes more activities which contribute to developing critical thinking.

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