The Journal of Asia TEFL

Language Learning Strategies, Multiple Intelligences and Self-Efficacy: Exploring the Links

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Recent research on students' multiple intelligences, self-efficacy, and language learning strategies has provided evidence for the development of crucial constructs and generalizations which have direct applications to language classrooms. The present study examined the interrelationships between the strategies language learners take, their level of self-efficacy, and the types of their intelligences (based on Gardner's (1983) Theory of Multiple Intelligences). To do so, Nation's (1990) 50-item multiple-choice vocabulary test was administered by a university department to form homogeneous groups across all the majors of the department. Then, three surveys were adapted to explore the links between (1) Self-efficacy in Reading (SER) (Prat-Sala & Redford, 2010), (2) a Multiple Intelligence Scale (Armstrong, 1993), and (3) Oxford's (1990) Language Learning Strategies. The most striking observation to emerge from the data comparison was that self-efficacy had no significant correlation with multiple intelligences. However, as expected, there was a significant correlation between language learners' perceptions of their self-efficacy and their language leaning strategies. Additionally, a multiple regression analysis indicated notable results on the use of self-efficacy and multiple intelligences to predict language learning strategies.

Keywords: multiple intelligences, self-efficacy, language learning strategies

Introduction

'Good language learner' studies in the 1970s fostered learner-centered pedagogy in language classrooms. From that decade on, an increasing amount of attention in language learning studies has been dedicated to learner variables. Intelligence, as a strategic variable in learning studies, has captured researchers' attention in recent years. Having resisted the traditional concept of intelligences, Gardner (1983) proposed that individuals benefit from a range of eight intelligence types, namely, verbal/linguistic, logical/mathematical, visual/spatial, bodily/kinaesthetic, musical/rhythmic, interpersonal, intrapersonal, and naturalistic intelligence. One implication of this theory is that teachers can enhance the teaching quality by taking different intelligences into account (Larsen-Freeman, 2000), and it can also help with recognizing the multidimensionality of language learners (Cohen, 2003). According to Gardner (2005), no single intelligence type is superior others, and people are different from each other when compared based upon their intelligences.

The other individual difference that plays a substantial role in language learning is self-efficacy, chiefly

individuals' cognitive self-concept concerning their perceived capabilities for given tasks. The other prominent determiner of success in language learning is strategy use. The strategies that an individual takes are influenced by a number of affective, cognitive, and social factors which can determine academic and non-academic success. Over the past two decades, researchers (e.g., O'Malley & Chamot, 1990; Oxford, 1990) made attempts to recognize and classify language learning strategies (LLS) of good language learners via techniques such as think-alouds, self-reports, and retrospection. Despite the growing body of literature in the area of multiple intelligences (MI), strategy use and self-efficacy continue to separately capture attention; there is as yet little solid knowledge concerning their interrelationships in an EFL context. A lingering question is whether or not MI, regardless of their types, conform closely to one's strategy use and self-efficacy; and if they do, it is important to explore the extent to which intelligence type can predict other influential variables in language learning.

Although a large amount of research (e.g., Gardner, 2005; Riazi, 2007; Zimmerman & Schunk, 2008) has been separately carried out on language learning strategies, metacognitive awareness, and self-efficacy in different contexts, there is still a paucity of studies addressing the relationship among these three variables simultaneously (Bonyadi, Rimani Nikou, & Shahbaz, 2012).

This study, therefore, attempts to explore EFL learners' use of LLSs across various intelligences types and self-efficacy in reading skills. In this regard, the following research questions were raised:

> Q1: Is there any significant relationship between EFL learners' use of different types of language learning strategies and their MI?
> Q2: Is there any significant relationship between EFL learners' use of language learning strategies and their self-efficacy?
> Q3: Is there any significant relationship between EFL learners' different types of MI and their self-efficacy?
> Q4: Is there any significant difference between EFL learners' self-efficacy and MI in predicting their use of language learning strategies?

Review of Literature

Language Strategies

Scholars in the field of language learning have provided a large body of definitions for language learning strategies. Tarone (1981) defined learning strategies as the attempts to develop linguistic and sociolinguistic competence in L2 language learning. Rubin (1987) later wrote that learning strategies (LS) "are strategies which contribute to the development of the language system which the learner constructs and affects learning directly" (p. 22). O'Malley and Chamot (1990) defined LS as "the special thoughts or behaviours that individuals use to help them comprehend, learn, or retain new information" (p. 1). Finally, building on work in her book for teachers, Oxford (1990) provides specific examples of LLS as the specific actions, behaviours, steps, or techniques that students (often intentionally) use to improve their progress in developing L2 skills and in facilitating the internalization, storage, retrieval, or use of the new language.

A strategy consists of mental or behavioural activities related to some specific stage in the overall process of language acquisition or language use (Ellis, 1999). Ellis also suggests that learning strategies should be problem-oriented, require specific actions or techniques, and (in)directly contribute to language learning.

Studies such as O'Malley and Chamot's (1990) have demonstrated the significance of LLSs in making the learning process more productive. Mochizuki (1999), conducting a study on Japanese students in a state-run university, maintained that Japanese university students employ compensation strategies more than other strategies, while affective strategies are the least used among all in language use.

Riazi and Rahimi (2005) used Oxford's (1990) taxonomies with 220 English majors in Iran, investigating their memory, cognitive, compensation, metacognitive, affective, and social LLSs. The researchers also used the 50 strategies appearing in Oxford's (1990) Strategy Inventory for Language Learning (SILL). The results indicated that Iranian EFL learners most often employ metacognitive strategies, while memory and social strategies were found to be of low recurrence.

Lau (2006) used think-aloud and interview procedures to investigate the strategies of eight young Chinese readers. The results showed that the four better Chinese readers used more strategies and had better abilities and awareness of strategy use than did the four poorer readers participating in the study. Also, the poorer readers tended to have less intrinsic motivation than the good readers. They were unwilling to process the text at a deeper level due to the combined problems of poor reading ability and a lack of motivation. They simply gave up when they encountered reading difficulties.

Riazi (2007) sought to find the relationships among educational levels, language learning strategies, and age with 120 female Arabic-speaking English majors at a university in Qatar. The study indicated that these Arab EFL learners had medium levels of metacognitive, cognitive, compensation, social, memory, and affective strategies. Also, it was found that freshmen students had the highest strategy use. Apart from compensation strategies, educational levels tended to be similar in the use of strategy categories.

Lai (2009) examined the interplay between LLS use and proficiency among English language learners in Taiwan. The findings indicated that proficiency levels are influential in strategy choice and use. More proficient learners employed more learning strategies, and that metacognitive strategies and cognitive strategies were used the most frequently and memory strategies were used the least frequently. However, the less proficient learners employed more social and memory strategies in language learning contexts.

Tsai et al. (2010) made an attempt to make a comparison between the strategy use of L1 (Mandarin Chinese) and L2 (English) use in their reading comprehension. The study reported that the more proficient readers took advantage of more strategies in order to enhance their comprehension.

Self-efficacy

Bandura (1997) defined self-efficacy as the belief people have in their capabilities to perform a specific task. In educational settings, self-efficacy is associated with learners' beliefs about their own academic capabilities (Pajares, 2007). Pajares adds that this belief influences people's cognitions, motivations, affective processes, and behaviour. Pintrich (1999) believed that self-efficacy belief is so important that it plays a key role in regulating behaviour leading to human competence.

In contrast to the people with low levels of self-efficacy, those with high levels of self-efficacy tended to persevere in the face of difficulties, exhibit intrinsic motivation, and were less likely to feel frustrated in case of failure. They are less likely to feel anxious and often regard a difficult situation as challenging as opposed to impossible (Bandura, 1997).

Perceived self-efficacy can also affect our emotional responses of fear and anxiety (Bandura, 1983). Students with high self-efficacy will persevere longer in the face of hardship and will be involved in learning tasks and activities with more attempts and considerations (Zimmerman & Schunk, 2008).

In academic contexts, surveys indicate that self-efficacy has a positive correlation with academic performance (Richardson, 2007), academic motivation (Bong & Clark, 1999), self-regulated learning (Schunk & Zimmerman, 1997), reading/writing performance (Pajares & Johnson, 1996), and negatively relates to cheating (Finn & Frone, 2004).

Perceptions of self-efficacy affect motivation (Wolters & Rosenthal, 2000), influence the targets people set, the attempts they make to achieve these aims, their tendency to persevere in the face of failure (Bandura 1986), and the strategies they take for proficiency in language learning (Wong & Siow 2003).

Also, the role of self-efficacy plays on the process of self-regulation has been investigated by different researchers. Through empirical surveys, researchers have found that learners' self-efficacy beliefs affect the choices they make and the attempts they make in their performance (Boekaerts & Cascallar, 2006). This claim was evidenced by studies which have revealed a positive correlation between self-efficacy

beliefs and the use of SRL strategies (Diseth, 2011; Yusuf, 2011).

Multiple Intelligences (MI)

Having proposed MI in the 1980s, Howard Gardner (1983) initiated a new learner-based theory in language instruction. He resisted the traditional conception of intelligence as a fixed and unitary concept. Gardner (1983) considered intelligences as verbal/linguistic, logical/mathematical, visual/spatial, bodily/kinaesthetic, musical/rhythmic, interpersonal, intrapersonal, and naturalistic. These diverse intelligences types "reflect a pluralistic panorama of learners' individual differences; they are understood as personal tools each individual possesses to make sense out of new information and to store it in such a way that it can be easily retrieved when needed for use" (Arnold & Fonseca, 2004, p. 120).

Of the implications of this theory is that teachers can enhance the teaching quality by taking different intelligences into account (Larsen-Freeman, 2000) and recognizing the multidimensionality of language learners (Cohen, 2003). No intelligence type is superior to the other ones, and people are different from each other when compared based upon their intelligences (Gardner, 2005).

Large bodies of research have been carried out to explore the language learners' views regarding their intelligence type. For instance, Chan (2001) did a survey to "assess the variability of the use of a self-report checklist identifying aspects of giftedness in a sample of 192 Chinese secondary students from a multiple intelligences perspective" (p. 215). The results revealed that the participants identified the seven intelligences somewhat as separate capabilities. However, "self-estimates of the various intelligences did not generally predict the conventional measures, suggesting that the seven intelligences and the conventional measures provided independent and possibly complementary information on aspects of giftedness" (p. 251). It is also conspicuously known that schools pay particular attention to reading and writing in language teaching. Thus, MI theory can open a new path to a range of teaching strategies applicable in the language classroom (Ahmed, 2012).

Stanford (2003) argued that the MI theory "opens the door to a wide variety of teaching strategies that can easily be implemented in the classroom.... the MI theory suggests that no one set of strategies will work best for all students at all times" (p. 82). She also highlighted that the MI theory can help teachers provide authentic assessment in language classes. In terms of gender differences, Loori (2005) maintained that "males preferred learning activities involving logical and mathematical intelligences, whereas females preferred learning activities involving intrapersonal intelligences" (p. 77).

With respect to the individual differences between secondary school students, Snyder (2000) analysed their learning styles and academic achievement. The findings demonstrated that most of the students were tactile/kinaesthetic-oriented. It was proposed that teachers should be aware of how students learn because it is crucial for productive learning.

Christi (2009), in a study with 23 teachers and teacher assistants, studied the effect of using MI teacher training on the self-efficacy of teachers. The results revealed that applying MI teacher training can significantly affect teacher self-efficacy.

Beichner (2011) has conducted research to investigate the association between students' academic self-efficacy and teachers' MI instructional approach. She investigated the differences in self-efficacy between groups of students whose teachers employed strategies in accordance with the students' dominant intelligences, and those whose teachers did not correspond their teaching styles to the students' intelligences. Beichner has reported that the learners participating in the former experimental group significantly achieved higher self-efficacy than that of the other two groups.

In an empirical investigation on the correlation between MI and learners' self-efficacy with EFL learners, Moafian and Ebrahimi (2015) reported a positive predictive power of linguistic and intrapersonal intelligences on learners' efficacy beliefs, while mathematical intelligence was found to be a negative predictor of students' self-efficacy beliefs.

Drawing upon the Teele Inventory of Multiple Intelligences (TIMI), McMahon et al. (2004) examined the interrelationship between intellectual preferences and reading achievement. The results have revealed

that learners with the higher scores on logical-mathematical intelligences were found to be more likely to "demonstrate at or above grade level reading comprehension scores compared with students who scored lower on logical-mathematical intelligences, but none on the other multiple intelligences scales was predictive of student achievement" (p. 41).

Using latent profile analysis (LPA), Kim et al. (2015) examined different patterns of self-efficacy beliefs among ESL learners. Having defined three groups of language learners based upon their self-efficacy, the results revealed that the high and medium self-efficacy learners were disproportionately female in comparison with the low self-efficacy profile. The low self-efficacy profile showed a significantly different pattern from the medium and high self-efficacy profiles regarding self-regulated learning strategies and language interpretation strategies.

Methodology

Participants

The 50 participants in the study were EFL students studying medicine at Tehran University of Medical Sciences, Iran. They were between 17 and 29 years old, with an average age of 18.35. They all were freshmen students who started their studies in the first semester of 2015. They had passed a placement test developed by the English Language Teaching Department of Tehran University of Medical Sciences. The test adapted Nation's (1990) language proficiency test so that homogeneous groups could be formed. Two classes, consisting of 22 males and 28 females, respectively, were randomly selected, and asked to participate in the study.

Instrumentation

Self-efficacy

To identify students' perceived self-efficacy in reading (SER) academic texts, the questionnaire developed and validated by Prat-Sala and Redford (2010) was used. The rationale for using SER is that this scale can evaluate the key skills needed while reading academic texts when compared with the other questionnaires designed for undergraduate students (i.e., Meier et. al., 1984; Shell et. al., 1989). Previous research is this field drew upon multiple scales to assess both reading and writing self-efficacy; therefore, the SER scale is more appropriate given the current study's aims.

Multiple intelligences

The MI survey developed by Armstrong (1993) was employed to identify participants with different types of intelligences. The framework, involving eight parts, represents the eight classes of intelligences based on Gardner's (1993) taxonomy of intelligences types. To investigate Armstrong's model in terms of reliability, Han's (2006) study reported that the Cronbach alpha coefficient of the overall MI inventory was found to be .90. In the current research, Cronbach alpha coefficient of the whole inventory was .88.

Learning strategies

A self-reported Strategy Inventory for Language Learning (SILL) (ESL/EFL Version), developed by Oxford (1990), was employed to identify the participants' perceived strategy use. SILL, consisting of six distinct parts of memory, cognitive, compensation, metacognitive, affective, and social strategies, is a self-rating questionnaire to examine the frequency of the strategies used by L2 learners. Ellis (1994)

argues that Oxford's classification of learning strategies is the most thorough model. An Alpha Cronbach reliability analysis, run by the researchers in a pilot study with other participants, found a satisfactory coefficient of .85 with the SILL.

Procedure and Analysis

The questionnaires were administered to the participants by the researchers during the semester. They were informed of the purpose of the study and their anonymity was also guaranteed. They were only required to give realistic estimates of the items in question. Due to the large number of items in the checklists, only one instrument was distributed in each session. No time limit was set for completing the instruments, but most of the participants managed to respond to them in an hour.

Results and Discussion

In order to answer the research questions, the researchers analysed the descriptive statistics and ran correlation and regression analysis. A normal distribution was needed to be met for administrating correlation tests. To do so, a one-sample Kolmogorov-Smirnov test was run to determine which test, parametric or nonparametric, was required for the present study (see Table 1).

TABLE 1
One-sample Kolmogorov-Smirnov Test

		Self-Efficacy	Multiple Intelligences	Strategies
N		50	50	50
Normal Parameters[a,b]	Mean	3.7400	.5728	2.9779
	Std. Deviation	.56460	.10044	.36045
	Absolute	.357	.109	.134
Most Extreme Differences	Positive	.263	.101	.134
	Negative	-.357	-.109	-.105
Kolmogorov-Smirnov Z		2.527	.770	.951
Asymp. Sig. (2-tailed)		.000	.593	.326

a. Test distribution is Normal.
b. Calculated from data.

The results illustrated that self-efficacy was non-normally distributed (Asymp. Sig. 2-tailed<.05), while both MI and language learning strategies were normally distributed (Asymp. Sig. 2-tailed>.05). Thus, nonparametric were run for the former scale (self-efficacy) with parametric for the latter two (MI and strategies).

Research Question 1

The study also sought to find the correlation between strategies and MI. The results indicated that a considerable correlation (r=.665) exists between the language learners' use of strategies and their intelligences (see Table 2).

TABLE 2
Correlations between Strategies and Multiple Intelligences

		Strategies	Multiple Intelligences
Strategies	Pearson Correlation	1	.665**
	Sig. (2-tailed)		.000
	N	50	50
Multiple Intelligences	Pearson Correlation	.665**	1
	Sig. (2-tailed)	.000	
	N	50	50

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

Tables 3 and 4 below provide information on how components of MI and language learning strategies are related.

TABLE 3
Correlations between MI and Components of Learning Strategies

		MI	Memory	Cognitive	Compensation	Metacognitive	Affective	Social
MI	Pearson Correlation	1	.023	.687**	.028	.470**	.0445**	.493**
	Sig. (2-tailed)		.872	.000	.846	.001	.000	.000
	N	50	50	50	50	50	50	50

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

The highest correlation is between the use of cognitive learning strategies and MI, followed by metacognitive, social, and affective strategies. These relatively high positive correlations between cognitive and metacognitive strategies with MI can be assumed as an indication that MI is of a rather cognitive nature and also signifies that successful language learning involves conscious planning and storage of L2 data.

TABLE 4
Correlations between the Subscales

		Verbal	Logical	Visual	Kinaesthetic	Musical	Interpersonal	Intrapersonal	Naturalistic
Memory	Pearson Correlation	.068	.007	-.102	.192	-.190	.259	-.024	-.147
	Sig. (2-tailed)	.640	.962	.481	.181	.186	.069	.870	.310
	N	50	50	50	50	50	50	50	50
Cognitive	Pearson Correlation	.370**	.355*	.286*	.238	.101	.017	.312*	.561**
	Sig. (2-tailed)	.008	.011	.044	.095	.487	.908	.028	.000
	N	50	50	50	50	50	50	50	50
Compensation	Pearson Correlation	.191	.160	-.063	.046	.089	.061	-.166	-.142
	Sig. (2-tailed)	.184	.266	.661	.749	.538	.676	.250	.327
	N	50	50	50	50	50	50	50	50
Metacognitive	Pearson Correlation	-.029	.131	.481**	.298*	.153	.210	.385**	.205
	Sig. (2-tailed)	.839	.365	.000	.036	.289	.144	.006	.152
	N	50	50	50	50	50	50	50	50
Affective	Pearson Correlation	.053	.178	.540**	.418**	.329*	.455**	.343*	.304*
	Sig. (2-tailed)	.713	.217	.000	.002	.020	.001	.015	.032
	N	50	50	50	50	50	50	50	50
Social	Pearson Correlation	.404**	.333*	.589**	.058	.104	.623***	.397**	.241
	Sig. (2-tailed)	.004	.018	.000	.687	.473	.000	.004	.092
	N	50	50	50	50	50	50	50	50

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

*. Correlation is significant at the 0.05 level (2-tailed).

Among the individual strategies, memory and compensation strategies were not significantly correlated with any intelligence type. The fact that compensation strategies did not show any significant correlation with any intelligence type is unexpected because there are aspects of MI that are of an interpersonal type, and one expects to find a relationship between this type of intelligence and compensation strategies as the language learner might need to use these strategies in case of a lack of knowledge. One interpretation of the lack of any significant correlations between memory and compensation strategies with any of the intelligences can be attributed to the nature of the survey (Armstrong, 1993), which seems not to reflect any particular modules regarding such features of language.

Affective strategies were found to show the highest correlation with most of the individual intelligences on the survey. It shows that those learners who most use affective strategies tend to have high values in intelligence. It can be argued that the strategies that language learners take to feel more relaxed and encouraged to learn can enhance their abilities to use their intelligences from different aspects and dimensions.

Following affective strategies, metacognitive and cognitive strategies were also found to be highly correlated with almost all the components of MI. It could be claimed that high scoring individuals on MI scales are found to be more meta-cognitive and cognitive language learning strategy users, that is, they know how to plan, manage, and organize learning process.

Social learning strategies did not correlate significantly with three MI components, but they meaningfully correlated with verbal, logical, interpersonal, intrapersonal, and visual intelligences. The fact that social strategies are significantly correlated with verbal linguistic and interpersonal intelligences would suggest that all three are related to the communicative aspects of language use, which needs a social connection with others and the environment to facilitate development.

All in all, the results of the current study highlighted a significant correlation between the participants' MI and language learning strategies use. The positive correlation between intelligences and learning strategies can be attributed to the fact that both relate to general problem-solving ability. Table 3 above illustrates that individual types of language learning strategies are, on a continuum of significance, correlated to overall MI. Visual spatial intelligences with social strategies (r= .589) and naturalistic intelligence with affective strategies (r=.304*) were found to have the most and least significant correlation among all subcategories of MI and learning strategies, respectively, while memory and compensation strategies were not connected to any types of intelligence. This result is supported by the claim that "Language learning and use are obviously closely *Linguistic Intelligence*" (Akbari & Hosseini, 2008, p. 153).

The results of the present study are consistent with some studies, such as Rahimi et al.'s (2012) and Iyitoglu and Aydin's (2015), which found a positive pattern between MI and learning strategies. In addition, Iyitoglu and Aydin's (2015) study reveals the relationship between: 1. global reading strategy use and naturalistic, musical, intrapersonal, and visual intelligences; 2. reading strategy use and intrapersonal intelligences, and 3. problem-solving reading strategy use and intrapersonal and verbal intelligences. Additionally, Akbari and Hosseini (2008) remark that "many aspects of MI correspond to certain aspects of language use such as communication skills (linguistic, interpersonal), meta-cognition (intrapersonal), and general cognitive abilities (mathematical)" (p. 150). After carrying out their study, Rahimi et al. (2012) concluded that there is a positive and meaningful relationship between linguistic, logical-mathematical, spatial, interpersonal, and intrapersonal intelligences and reading strategy use in general, and between metacognitive and cognitive reading strategy use in particular.

Research Question 2

A second aim of this study was to investigate the relationship between language learners' perceptions of self-efficacy and their use of language learning strategies. The Spearman correlation between the participants' self-efficacy scores and total strategy inventory was 0.597, p < 0.01. This moderate correlation indicates that there is a significant positive relationship between language self-efficacy and strategy use (see Tables 5).

TABLE 5
Correlations between Self-efficacy and Language Learning Strategies

			Self-Efficacy	Strategies
Spearman's rho	Self-Efficacy	Correlation Coefficient	1.000	.597
		Sig. (2-tailed)	.	.000
		N	50	50
	Strategies	Correlation Coefficient	.597	1.000
		Sig. (2-tailed)	.000	.
		N	50	50

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

Knowing the connection between self-efficacy and language learning strategies, it can be postulated that learners with high self-efficacy are able to perform tasks employing more cognitive and metacognitive strategies and persist longer in comparison with those who do not. As Bandura (1986) put it, self-efficacy "is people's judgments of their capabilities to organize and execute courses of action

required to attain designated types of performances" (p. 391). It can be also argued that a high level of self-efficacy might lead to more motivation to follow the assigned tasks, allow people to make more attempts to achieve the goals, and to give more effort to meet satisfactory results. Therefore, self-efficacy can directly (by activating learners' cognitive and metacognitive resources) or indirectly (through motivation and willingness to pursue the tasks) increase the strategies used by language learners.

The findings of the current research seem to be in contrast with that of research by Green and Oxford (1995), Magogwe, Mokuedi, and Oliver (2007), all of whom indicated a clear correlation between self-efficacy and LLSs. Attributing language learners' problems to their self-beliefs, Pajares (2003) maintained that students' low performance and achievement originate from low self-beliefs. Further, Zimmerman (1990) pointed out that using strategies that are closely associated with a sense of self-efficacy contribute to better learning outcomes. Zimmerman also added that growth of one's self-efficacy or level of confidence from positively completing a task is closely relevant for effective use of appropriate. The above-mentioned studies argue that higher-score learners on the scales of self-efficacy and self-confidence employ more strategies and undertake more challenges.

Research Question 3

A third objective of this study was to obtain further insights into whether language learners' self-efficacy is related to their MI or not. To answer the third research question, a Spearman correlation test was run to indicate the relationship that self-efficacy may have with MI. The Spearmen's index (rho=.084) reports that its correlation with MI is not significant (see Table 6).

TABLE 6
Correlations between Self-efficacy and Multiple Intelligences

			Self-Efficacy	Multiple Intelligences
Spearman's rho	Self-Efficacy	Correlation Coefficient	1.000	.084
		Sig. (2-tailed)	.	.563
		N	50	50
	Multiple Intelligences	Correlation Coefficient	.084	1.000
		Sig. (2-tailed)	.563	.
		N	50	50

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

To justify the lack of significant correlation between MI and self-efficacy, it makes sense to say that there are not enough components in both scales to find the relationship between these two constructs. The findings of the current study partially disapprove those of Shore (2001), as he concluded that MI-based classrooms (with a focus on interpersonal, intrapersonal, bodily-kinaesthetic, and linguistic intelligences) would have a positive effect on writing self-efficacy in ESL courses.. Furthermore, the results are in contrast to the findings of Yazdanimoghaddam and Khoshroodi's (2010), who observed that linguistic and musical intelligences are the two main predictors of teachers' teaching efficacy.

Research Question 4

A regression analysis was administered to determine the extent to which language learner's MI and their perceptions of self-efficacy can predict the use of strategies by language learners. As displayed in Table 7, the explanatory variables (MI and self-efficacy) could predict up to 44.6 percent (R = .668, R2 = .446) of the variance in the response variable (language learning strategies).

TABLE 7
Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.668[a]	.446	.423	.27390	.446	18.932	2	47	.000	1.562

a. Predictors: (Constant), Self-efficacy, Multiple intelligences

b. Dependent Variable: Strategies

Below, the first plot shows that the variables were normally distributed. In other words, the linearity of the model was observed (Figure 1).
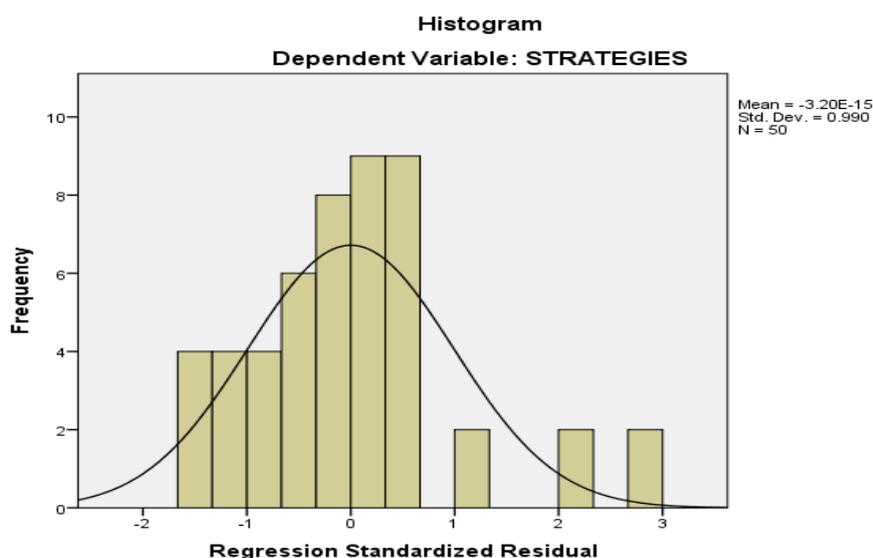

Figure 1. Normal probability plot

The results of Cook's distance indicated that there were not any significant outliers (Table 9). The minimum (0) and maximum (.181) Cook's distances are lower than one.

TABLE 8
Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
1 (Constant)	1.479	.334		4.422	.000	.806	2.151
Multiple intelligences	2.375	.390	.662	6.086	.000	1.590	3.161
Self-efficacy	.037	.069	.058	.535	.595	-.103	.177

a.   Dependent Variable: Strategies

The table illustrates that MI (p-value=.0005) play a significant role in predicting the strategies taken by language learners. Further, VIF reveals that both the explanatory variables (MI and self-efficacy) are not

collinear. The third finding from the table relates to the second variable, self-efficacy. The statistics have shown that the addition of self-efficacy (p-value= .595) does not function as a significant variable in predicting the strategies by language learners.

TABLE 9
Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	2.4161	3.4012	2.9779	.23986	50
Std. Predicted Value	-2.342	1.765	.000	1.000	50
Standard Error of Predicted Value	.038	.099	.052	.016	50
Adjusted Predicted Value	2.4052	3.4344	2.9775	.24217	50
Residual	-.38579	.79657	.00000	.26906	50
Std. Residual	-1.419	2.930	.000	.990	50
Stud. Residual	-1.438	2.978	.001	1.012	50
Deleted Residual	-.39741	.82297	.00040	.28159	50
Stud. Deleted Residual	-1.454	3.264	.014	1.056	50
Mahal. Distance	.001	5.486	.980	1.363	50
Cook's Distance	.000	.181	.024	.047	50
Centered Leverage Value	.000	.112	.020	.028	50

a. Dependent Variable: Strategies

Finally, the Mahalanobis distance and Cook's distance in Table 9 demonstrate that there is no need to be concerned about influential outliers.

As reported by the statistical procedures, MI is a significant factor to predict the shared variance with language learning strategies. As a result, another multiple regressions was run to investigate which individual sub-components of MI lead to strategies prediction.

TABLE 10
Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
1	(Constant)	2.215	.189		11.729	.000	1.835	2.595
	Verbal Linguistic	1.195	.288	.514	4.154	.000	.617	1.774
2	(Constant)	1.817	.239		7.613	.000	1.337	2.298
	Verbal Linguistic	1.142	.274	.491	4.170	.000	.591	1.693
	Interpersonal	.585	.232	.297	2.521	.015	.118	1.052
3	(Constant)	1.594	.246		6.479	.000	1.099	2.089
	Verbal Linguistic	1.121	.261	.482	4.292	.000	.595	1.646
	Interpersonal	.597	.221	.303	2.696	.010	.151	1.043
	Naturalistic	.366	.153	.268	2.394	.021	.058	.674

a. Dependent Variable: Strategies

TABLE 11
Model Summary[d]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.514[a]	.264	.249	.31235	.264	17.254	1	48	.000	
2	.593[b]	.352	.324	.29627	.088	6.354	1	47	.015	
3	.651[c]	.424	.386	.28240	.072	5.731	1	46	.021	1.893

a. Predictors: (Constant), Verbal Linguistic

b. Predictors: (Constant), Verbal Linguistic, Interpersonal

c. Predictors: (Constant), Verbal Linguistic, Interpersonal, Naturalistic

d. Dependent Variable: Strategies

To investigate the efficacy of each sub-component of MI in strategies, stepwise multiple regressions were conducted (Tables 10 and 11), showing that the verbal linguistic intelligence and strategy use shared 25% of variance. When both verbal linguistic and interpersonal intelligence are added to the regression, 32.5% of the shared variance can be attributed to the contributions of the explanatory variables. Ultimately, verbal linguistic, interpersonal and naturalistic intelligences shared 38% variance with strategy use. Finding verbal linguistic and interpersonal intelligences as the positive predictors of strategies is not a matter of surprise as they are directly and indirectly language-related.

To explain the link between L2 LLSs and linguistic intelligence, it would be logical to argue that once an individual realizes the existence of such a construct as linguistic intelligence, it may be a usual assumption that such an intelligence is directly related to verbal and linguistic abilities: ''Language learning and use are obviously closely linked to what MI theorists label Linguistic Intelligence'' (Richards and Rodgers, 2001, 117).

To explain the predictability of interpersonal intelligence, Larsen-Freeman and Long (1991) argued that extroverted learners perform better since compared with poor language learners they more efficiently employ LLSs. It can be further argued that individuals who are interpersonally more intelligent seem to be more extroverted. Thus, this can be postulated that these people know how to draw on social and public interactions to enhance their academic accomplishments.

Regarding the contribution of naturalistic intelligence, one might get surprised after finding such a relationship between this type of intelligence and environmental variables. To justify this, it can be said that the individuals with naturalistic intelligence are socially and verbally more active than others and consequently more cognizant of how language functions and learning processes operate.

Conclusion and Implications

This paper has given an account of the interplay between MI, self-efficacy, and learning strategies used by EFL learners. Prat-Sala and Redford's (2010) model of reading self-efficacy, along with Oxford's (1990) language learning strategies and Armstrong's (1993) MI survey, were employed to determine the extent to which these variables are correlated. Overall, the results have shown that some of the variables of the study, but not all, are positively and statistically associated with each other.

All together, the relationship between LLSs and MI showed a meaningful correlation (r= .65). To further analyse the correlation, another Pearson Moment Correlation was conducted to find the relationships between the sub-components of strategies and intelligence. The findings revealed that the use of cognitive learning strategies, followed by metacognitive, social, and affective strategies were more correlated with MI than other strategies. An explanation for this is that higher-scoring individuals on MI scales are found to be more meta-cognitive and cognitive strategy users, that is, they know how to plan,

manage, and organize the learning process as well as their resources. Furthermore, the high correlation between MI and affective strategies suggest that the strategies that language learners take to feel more relaxed and motivated can enhance their ability to use their intelligences along different aspects and dimensions. Overall, the positive correlation between intelligences and learning strategies can be attributed to the fact that both relate to general problem-solving ability.

In addition, the statistical procedures run to find such an interrelationship between self-efficacy and multiple intelligence, on the one hand, and with language learning strategies, on the other, reported a significant correlation just with the latter. The lack of correlation between self-efficacy and MI was attributed to the low potentiality with the scales for finding associations between them. However, it was postulated that that learners with high self-efficacy are able to perform tasks employing more cognitive and metacognitive strategies and persist longer in comparison with those who do not. So, self-efficacy can directly (by activating learners' cognitive and metacognitive resources) or indirectly (through motivation and willingness to pursue the tasks) increase the strategies taken by language learners.

The last aim of the study was to find the extent to which MI and self-efficacy can predict the strategies by language learners. The results from multiple regression showed that the model can predict 44.6% of the shared variance. However, the stepwise multiple regressions run in the study revealed that verbal linguistic, interpersonal and naturalistic intelligences can significantly predict the variance shared between MI and strategies, indicating that socially and verbally intelligent learners are more apt to use strategies at the appropriate time.

One possible implication of the present study would be for language teachers to use a number of techniques and strategies to integrate various learning strategies in their classes. A well-equipped language learner can take advantage of each strategy at the appropriate time. Also, language teachers can assist their learners to select better and more suitable strategies for developing reading skills. As a result, teachers should use necessary strategies to provide situations appropriate for enhancing learners' performance and goals. Instructors and teachers are expected to be aware that students tend to show more effort and employ more appropriate cognitive and metacognitive strategies when they feel that a task interesting, valuable, and important, thereby leading to higher academic performance. The third implication of the present study is that it can be helpful for materials developers to detect, revise, and modify textbooks and materials so that they include various strategies relating to different kinds of intelligences.

The current study, like any other study, is not void of limitations. First, the participants were selected with convenience sampling from universities in Iran, which makes it difficult to generalize the findings to other contexts. Second, the participants were asked to respond to questionnaires. Other techniques such as interviews and observations would be useful to include in future studies. Further research can include self-efficacy in writing for predicting language production. Interested researchers can consider other socio/cognitive variables, such as personality traits or learning styles, to investigate the interplay between them and MI.

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