A Structural Model of Learners' Epistemic Beliefs, Self-Efficacy, Motivational Self-System, and Language Learning Strategies: Does Gender Make a Difference?

Hamed Barjesteh[*]
Associate Professor
Department of English Language and Literature
Ayatollah Amoli Branch, Islamic Azad University
Amol, Iran
Email: ha_bar77@yahoo.com

Shaghayegh Shirzad
Department of English Language and Literature
Ayatollah Amoli Branch, Islamic Azad University
Amol, Iran
Email: shaghayegh_shirzad2010@yahoo.com

Abstract. Regarding the constructive impact of learners' beliefs in learning a second language (L2), understanding the learners' self-efficacy (LSE), epistemic beliefs (EBs), and their orientation towards language learning strategy (LLS) has gained attention among researchers in educational psychology. To undertake this line of research, this study aims to test the directional interplay between male and female EBs and their motivational self-system (MSS), and LLS. To do this, 300 Iranian students were selected using a cluster random sampling method to fill out four questionnaires (n = 1200). Pearson correlation and structural relationships were conducted to analyze the data. The findings revealed that 71 percent of the LLS can be predicted by EBs, MSS, and LSE. Notably, the analysis of the theorized model via the structural equation modeling (SEM) approach revealed that the level of EBs can significantly diminish LLSs. Besides, MSS and LSE could act as mediating constructs promoting LLSs. Moreover, the findings showed that gender

made a difference with regard to EBs, LSE, MSS, and LLSs. The implications and findings are considered in the present study. Findings and possible implications are suggested as well.

Keywords: Hypothesized Model, Learners' beliefs, Learning Strategy, Motivational Self-system, Self-efficacy

1. Introduction

L2 learning is affected by various constructs such as learners' beliefs, conceptions, and attitudes about the nature and quality of obtaining knowledge. Among these constructive factors are EBs, motivation, and LSE in educational psychology (Bandura, 1986; Drnyei, 2007; Hofer & Pintrich, 1997). Schommer (1990) conceptualized EBs as an innate ability. To Schommer, such ability cannot be developed with instruction. Hofer (2016) conceived EBs as the conceptions of the quality of knowledge and learning. Greene, Sandoval, and Brten (2016) defined epistemic cognition as "a process involving dispositions, beliefs, and skills regarding how individuals determine what they actually know, versus what they believe, doubt, or distrust"(p. 46). They used different terminologies (e.g., personal epistemologies, epistemological beliefs, epistemic beliefs, or development) to conceptualize the construct.

learners' self-efficacy (LSE) is another construct which factored in this study. LSE is the willingness to initiate tasks and the extent to which learners have sufficient effort to accomplish activities (Deuling & Burns, 2017; Hofer & Pintrich, 1997; Razmi, Jabbari, & Zare, 2020). It is the "individual's belief in his or her own ability to organize and implement action to produce the desired achievements and results"(Bandura, 1986, p3). LSE is divided into general or specific belief. The former relates to overall perceived competence in various distressing atmospheres, but the latter concerns a specific condition (Bandura, 1986). Voluminous studies (e.g., Fathi, Ahmadnejad, & Yousofi, 2019; Heidarzadi, Barjesteh, & Nasrollahi Mouziraji, 2022; Ongowo, 2021; Peffer & Ramezani, 2019; Shirzad, Barjesteh, Dehqan, & Zare, 2021; Winberg, Hofverberg, & Lindfors, 2019) show that EBs and LSE are important factors in gaining knowledge. Such findings highlight that the LSE can positively affect

learning in education in various dimensions such as language achieve-ment, self-concepts, motivation, and learning conception.

Another important factor in learning is motivation. Motivation is an infernal force which guides learners' behavior in a specific direc-tion. Motivation can be investigated through behavioral, cognitive, and constructivist approach. In the cognitive approach of motivation, it is believed that individuals' thoughts and feelings stemmed from their motivations. As suggested by Cognitivists, behavior is shaped and di-rected by roles, expectations, and the ratio of individual's data (Drnyei, 2007). Drnyei maintains that "the cognitive-situated period of [second language] motivation research shifted the attention to classroom-specific aspects of motivation and created a fertile ground for educational impli-cations directly relevant to classroom practice" (p. 111). Drnyei (2005) proposed a model of MSS originating from previous patterns and empir-ical evidence in psychological studies, on L2 motivation. Practitioners (Shirzad, Barjesteh, Dehqan, & Zare, 2021; Lila, 2016) conceptualized motivation as a multi-faceted factor that affects various aspects of lan-guage learning. These practitioners concluded that high motivation in learning paves the ground for gaining and applying knowledge in a more coherent form and in real-world situation.

Many studies (e.g., Cheng, 2020; Hofer, 2016; Krchner, Schne, & Schwinger, 2021; Lonka, Ketonen, & Vermunt, 2021; Razmi et al., 2020) in the L2 professional literature confirmed that there is a posi-tive interplay between teachers and learners' EBs and the level of self-efficacy, self-regulation, language anxiety, conceptions of learning, mo-tivation, and education. These studies have been implemented to test the interplay between two variables by using different common research methods (i.e., correlational, cross tap analysis, experimental and non-experimental studies). Recently, Shirzad et al., (2021) found that LSE is a robust predictor of LLSs. Besides, Heidarzadi, et al. (2022) explored that writing self-efficacy and EBs can influence L2 writing anxiety. They concluded that high LSE can lead to less writing anxiety. However, scare studies have been implemented to explain how the variables under the investigation (i.e., EBs, LLS, MSS, LSE) can influence one another di-rectly or indirectly. Thus, in an attempt to fill the gap, this study probes

directional relationship between male and female EBs, LSE. MSS, and LLSs. Accordingly, this study aims to discover the relationship among the above constructs with junior high-school LLSs. This can be done through the mediators of students' MSS and LSE. To undertake the study, SEM approach was employed to uncover the multivariate associations Besides, it has been suggested that EBs, MSS, and LSE can influence LLSs. Notably, EBs, MSS, and LSE may directly influence the type of strategy that male and female students utilize in their learning process. Specifically, it has been proposed that such constructs positively predict male and female learners' LLSs. Therefore, a conceptual model was proposed to examine males and females' affective factors (EBs, MSS, and LSE) as the predictors of LLSs.

The L2 professional literature indicated a supportive effect of EBs on the academic achievement (e.g., Greene, et al., 2016; Hofer, 2016; Ongowo, 2021; Peffer & Ramezani, 2019) and the positive interplay of LSE and LLSs (e.g., Cheng, 2020; Morris, Usher, & Chen, 2017; Pajares, 2007). The findings ended in drawing a tentative direction from EBs/LSE to LLSs and MSS to LLSs. To model the structural relationships, a conceptual model was formulated at the theoretical phase of the study. Specifically, the proposed model calls a causal direction and the associations between EB and LLSs through the mediating impact of LSE and MSS. to be more specific, this study uncovers how LSE and MSS mediate the predictive effect of EBs on students' LLSs (See Figure 1).

To undertake the study, some correlational, directional and differential questions were addressed:

RQ1: Is there any significant interplay among LSE, EBs, MSS, and students LLSs?

RQ2: Do epistemological beliefs directly affect high school students' language learning strategies?

RQ3: Does learners' motivational self-system significantly predict students' language learning strategies?

RQ4: Does learners' self-efficacy directly affect students' language learning strategies?

RQ5: Does gender make any difference in students' epistemological beliefs, motivational self-system, self-efficacy, and language learning strategies?
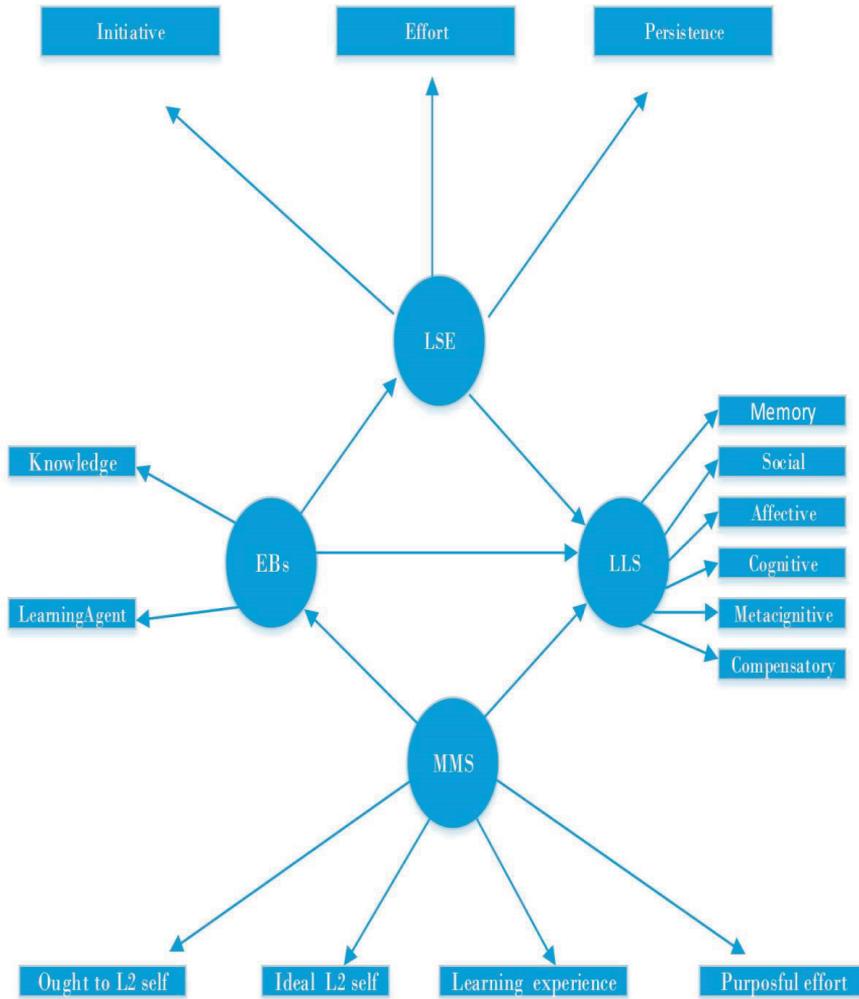

Figure 1. The conceptual model among the constructs

2. Literature Review

2.1 Epistemological beliefs

The term epistemology deals with the nature, source, borders, accuracy, reliability and validity of knowledge. It also concerns how individuals gain knowledge, skills, and the way they transfer knowledge and information in the learning process (Hofer & Pintrich, 1997). The scholars have distinguished some dimensional aspects for EBs. They classified the construct into four main facets: "certainty of knowledge," "simplicity of knowledge," "source of knowing," and "justification of knowing." All four aspects were then summarized into two smaller constructs known as the nature of knowledge (i.e., certainty of knowledge," "simplicity of knowledge), and the nature of knowing (i.e., source of knowing," and "justification of knowing). Certainty of knowledge shows whether knowledge is definite or indefinite. It implies that when knowledge is definite, perfect truth exists clearly. Simplicity of knowledge is concerned with the extent to which knowledge is fixed, perfect or relative. The third dimension addresses the way knowledge can be manipulated by the individual or it resides in external authority. The last dimension, (i.e., justification of knowing) deals with how knowledge is vindicated. Hofer (2016) asserts that epistemic studies reflect on how students employ their thoughts about knowledge.

2.2 Self-efficacy theory

In educational psychology, the theory of self-efficacy was originated by (Bandura, 1986). The self-efficacy theory stems from the cognitive-behavioral psychology. Bandura postulated that self-efficacy is a presumption in individual's competence to overcome important life events. In his SET, Bandura (1986) conceptualized LSE as "people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performance"(p. 174). (Bandura, 2006) distinguished various aspects of LSE beliefs: mastery experiences, vicarious experiences, verbal persuasion, and emotional arousal. To Bandura, self-efficacy beliefs are context-specific evaluation of individual power to manipulate and perform courses of action to gain a specific goal. It pinpoints the tasks and activities one can execute. LSE beliefs reveal

how individuals perceive, ponder, motivate themselves and act. Such beliefs generate the different effects through various processes of cognitive, motivational, affective and selection (Cheng, 2020). Hofer (2016) posits that the level of LSE may attribute failure and success to external forces. Likewise, Razmi et al. (2020) postulate that students with low self-efficacy may ascribe breakdown to an initial lack of ability.

2.3 The motivational self-system

Motivation is defined as a set of inclinations and motive forces that relates to a behavioral objective or the coming action (Papi, et al., 2018). Motivational studies have shifted to socio-dynamic period fueled by the work of (Drnyei, 2005) known as MSS framework. Drnyei and Ushioda (2009) disputed the role of the integrative variable with regard to learners' motivation. They posited that learners have no direct access to the target language speakers in a foreign language situation. Therefore, the role of the integrative motive is diminished. Drnyei and Ushioda (2009) proposed that the MSS consists of three main aspects: (a) the ideal L2 self, (b) the ought-to L2 self, and (c) the L2 learning experience. The ideal L2 self represents learners' desire, hopes and wishes. However, the second aspect (i.e., ought-to L2 self) refers to the position that individual would want one to reach. Accordingly, it deals with the assumptions designed in advance. Next, the L2 learning experience relates to an individual's environmental experience. Notably, the L2 learning experience concerns various learning environments such as the teacher, students, and the program. Practitioners (e.g., Lila, 2016; Papi et al., 2018; Shirzad et al., 2021) conceptualized motivation as a multi-faceted factor that affects various aspects of language learning. Some authorities (i.e., Drnyei, 2007; Papi, Bondarenko, Mansouri, Feng, & Jiang, 2018) underscored that high motivation in learning paves the ground for gaining and applying knowledge in a more coherent form and in a real-world situation and the way learners approach LLSs.

2.4. Taxonomies of language learning strategies

LLSs are etiquettes or actions which individuals employ to success or self-direct in the learning process (Oxford, 1990). Chamot and Harris (2019) argued that teaching learning strategies make language learn-

ing successful and help the learning process. Different taxonomies were employed to classify L2 LLSs. Cohen (2018) suggested two important factors (i.e., choice and consciousness) in the taxonomy of LLSs. Cohen classified L2 learning strategies and L2 use strategies as two main elements of LLSs. A second classification system was proposed by Oxford (1990). Oxford considers direct or indirect strategies as two factors for the classification. Oxford defined many sub- classifications for each of the direct and indirect strategies. O'Malley and Chamot as cited in (Chamot & Harris, 2019) presented the third categorization. O'Malley and Chamot classified LLSs into three main criteria: cognitive, affective, or socio-affective. Using the linguistics criteria, Tarone Cohen, and Dumas, (1976, cited in Chamot & Harris, 2019) have classified strategies into four main components: (a) phonological, (b) morphological, (c) syntactic, or (d) lexical. They maintained that fostering LLSs can contribute to successful language learning. To support the theoretical assumption, some empirical studies corroborated the role of LLSs in the L2 learning. Shirzad et al. (2021) conducted a multivariate statistical framework to model complex relationships among EB, LLSs, and MSS. They found that EB had a significant impact on the LLSs with the mediating role of L2MSS. Similarly, some empirical studies (Cheng, 2020; Griffiths, 2018; Habk & Magyar, 2018) pinpointed that students are more unlikely to use different strategies when they show stronger beliefs in their knowledge and learning agent. Currently, Shirzad et al. (2022) examined EBs and LSE as the predictors of LLSs. They concluded that LSE enjoyed higher explanatory power than EBs in predicting LLSs. Thus, they proposed that language policy makers should pinpoint LSE as an important variable influencing LLSs.

3. Method

3.1. Participants

A total of 300 participants (123 males and 177 females) participated for the purpose of the current study. They were deliberately selected from high school because a widely accepted rule of thumb for a sample size in SEM model is a minimum factor of 15 for the observed variables (Fornll & Larcker, 1981). To determine a sufficient sample size regarding the ob-

served variables (n=15) and to apply the coefficient of 15 per variable, a total number of 300 high school students are considered as a sufficient sample size. High school students were available during the week, thus, each student could easily fill out 4 questionnaires. This will increase the internal validity of the findings of the present study. Besides, it seems that having a subject pool of all students both at state run and private high schools can promote the generalizability of the findings of the current study. In order to minimize the bias effect, the researcher deliberately selected a cluster of participants from 12 high-schools at three areas in two cities. However, the study was limited in the city without considering the rural area. To choose a representative population, a cluster sampling technique was used meaning that the participants were randomly selected from different districts, schools, and cities, as well as having gender and age range (M =17, SD = 1.7).

3.2. Instruments

To undertake the current study, 4 instruments were used: (a) Epistemological Beliefs Questionnaire,(b) Drnyei and Taguchi's (2009) MSSQ, (c) Oxford's (1990) Strategy inventory for language learning (SILL), and (d) Sherer's general self-efficacy questionnaire (GSEQ). The EBQ was the first instrument used to collect data. (Schommer, 1990) EBQ was used to examine students' overall epistemic knowledge. The scale comprised 16 negative or positive five-point Likert scales with the aim of testing knowledge and learning agent. It enjoyed a value of ($\alpha = .74$) for simple/definitive knowledge, a value of ($\alpha = .67$) for fast/fixed learning agent, and a value of ($\alpha = .83$) for all subsets. The second instrument was the GSEQ validated by Sherer et al. (1982). GSEQ included 23 items measuring general and social LSE. The scale enjoyed relatively high internal consistency ($\alpha = .79$) in a pilot study. For the purpose of this study the revised version was used. It comprised three components including initiative, persistence, and effort. The next instrument was SILL. The SILL comprised 50 items in a five-point Likert type. The scale enjoyed a high reliability index ($\alpha= .91$) in the context of Iran. The last instrument was MSSQ. For the purpose of the present study, the Persian-translated version of MSSQ was employed. It was already translated into Persian by Drnyei and Taguchi (2009) with a reported reliability of .83. The items

were measured by six-point Likert scales varying from 1 (strongly disagree) to 6 (strongly agree). This section contained four subscales. Each section comprised of 6 items. More specifically, ideal-L2 self-measured particular facet of students' ideal self. Ought-to L2 self gauged the traits that a learner thinks to possess (i.e., responsibilities, duties, or commitments). The intended effort quantified students' intended endeavor toward learning English. Finally, the last subscale determined the specific motives concerned with a direct learning experience. (Papi et al., 2018) undertook the reliability and validity of the new version among different students in Iran. Cronbach alpha coefficients were run for different scales. The Cronbach alpha coefficient of each scale has been provided as what follows: Ideal-L2 self (Cronbach alpha = .77), ought-to self (Cronbach alpha = .70), L2 learning experience (Cronbach alpha = .84), and attitudes to learning English (Cronbach alpha = .80). Knowing the fact that reliability is sample dependent, the MSS was examined among 43 high-school students at a state-run schools located in Amol and Babol, Iran. Cronbach alpha reliability was found to be .86. Thus, the questionnaire proved to be a suitable instrument for high-school students in Iran.

3.3. Data collection procedure

This study sought to analyze the interrelationships among a number of variables including EBs, MSS, LLSs, and LSE. To undertake the study, the SEM was used as a data analysis tool to conceptualize and test theoretically driven hypothesis about linear association among variables. It was used as a confirmatory modeling to test the structural relationship, and to investigate the effect of observed or latent variables. Next, the conceptualized model was tested in terms of reliability and validity. Then, different questionnaires, including EBQ (Schommer, 1990), MSSQ (Drnyei & Taguchi, 2009), GSEQ (Sherer et al., 1982), and SILL (Oxford, 1990) were distributed at different intervals among the target participants. A total number of 1200 questionnaires were distributed over four months in 16 weeks in May 2019. Of all instruments, 350 scales (29%) were not considered for the analysis due to unprepared, inadequate or late response. Therefore, 850 scales (86%) met the criteria for the analysis. Finally, all the qualified data were considered for the

analysis using the analysis of moment structures (AMOS) version 21.

3.4. Data analysis

The data were analyzed using the AMOS 21. Initially, some preliminary steps were taken to tap the descriptive statistics of each variable. Second, the outlier data were determined using Skewness, Kurtosis, Box plot, and a Mahalanobis test. Then, a Kolomogrov Smirnove test was conducted to probe the normality of data. Fourth, to undertake SEM, various assumptions were met to screen the relationship between observed variables and the associated constructs. In so doing, Pearson correlation matrix was run to determine the interplay among the constructs. Besides, the confirmatory factor analysis (CFA) and composite reliability (CR) were run to indicate the possibility of conducting a conceptual model of research. Next, Goodness of Fit Indices of the constructs was employed at three corrective steps. Finally, direct maximum likelihood estimation was run to illustrate the finalized fitting model with respect to three fit indices, namely Adjusted goodness of fit test (AGFT), comparative fit index (CFI), and parsimonious fit index (PFI).

4. Results

4.1. Checking the assumptions: Normality and correlation

To answer the research questions, skewness and kurtosis analysis were run in the preliminary phase. The results enjoyed appropriate bound for the various factors. It shows that the skewness value for the sub-factors is between -3 and +3, and kurtosis value ranges from -10 to +10. Then, Mahalanobis test was run to check multivariate outlier. The result revealed that 850 questionnaires fall within the qualified range. Next, Pearson product moment correlation was conducted among EBs, MSS, LSE, and LLSs. Table 1 illustrates the matrix among the main variables.

Table 1 indicates that there is a positive significant linear interplay among LSE, MSS, and LLSs with the corresponding component as follow: MSS (i.e., purposeful effort, learning experience, ideal self, and ought to self); LSE (i.e., persistence, effort, initiative);LLSs (i.e., memory, social, effective, cognitive, metacognitive, and compensatory). Besides, there is a negative linear significant interplay between the components of EB and LLSs.

Table 1: Pearson Correlation Matrix among EBs, MSS, LSE, and LLSs

Constructs	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Knowledge	1																	
LA	**.82	1																
Total EBs	**.62	**.51	1															
Initiative	**.29	**.33.	**.20.	1														
Effort	**.18.-	**.18.-	**-.18	**.52	1													
Persistence	**-.17	**-.18	**-.17	**.49	**.55	1												
Total LSE	**-.20	**-.19	**-.21	**.54	**.67	**.62	1											
Out to self	**-.15	**-.16	**-.19	**.18	**.20	**.18	**.24	1										
Ideal Self	**-.19	**-.20	**-.20	**.23	**.94	**.93	**.27	**.29	1									
PE	**-.21	**-.20	**-.17	**.24	**.13	**.16	**.21	**.45	**.38	1								
LE	**-.30	**-.26	**-.23	**.30	**.15	**.15	**.19	**.38	**.37	**.40	1							
Total MSS	**-.31	**-.32	**-.25	**.29	**.22	**.20	**.23	**.54	**.60	**.54	**.68	1						
Memory	**-.19	**-.19	**-.17	**.21	**.16	**.15	**.19	**.13	**.15	**.74	**.22	**.27	1					
Cognitive	**-.17	**-.18	**-.18	**.19	**.17	**.19	**.21	**.18	**.19	**.70	**.19	**.25	**.51	1				
COMP	**-.30	**-.27	**-.26	**.31	**.19	**.20	**.25	**.25	**.25	**.20	**.22	**.31	**.43	**.43	1			
MET	**-.26	**-.26	**-.21	**.25	**.17	**.21	**.24	**.25	**.25	**.41	**.18	**.25	**.35	**.50	**.48	1		
Affective	**-.23	**-.20	**-.22	**.25	*.10	**.17	**.22	*.11	**.16	**.17	**.24	**.29	**.48	**.52	**.68	**.51	1	
Social	**-.22	**-.26	**-.37	**.53	**.20	**.22	**.22	**.22	**.24	**.20	**.19	**.27	**.66	**.65	**.68	**.40	**.63	1
Total LLSs	**-.21	**-.28	**-.33	**.60	**.22	**.22	**.23	**.17	**.24	**.21	**.26	**.42	**.74	**.40	**.46	**.51	**.46	**.64

Note: ** p<.05; LA=Learning Agent; PE= Purposeful Effort; LE= Learning Experience; COMP = Compensatory; MET = Metacognitive

4.2. Analysis of direct research questions

To analyze the direct effect of EBs, LSE, and MSS on learning strategy, maximum likelihood estimation (MLE) test was run (See Table 2).

Table 2: Direct MLE for Learning Strategy

	Unstandardized Coefficients	Standardized Coefficients	
Variable	B	β	R^2
EBs	.-482	-.380	.183
L2MSS	.271	.187	.051
LSE	.243	.167	.042

Table 2 indicates that direct MLE of the EBs, MSS, and LSE have a direct effect on the learning strategy. Table 2 also presents standardized coefficients for the constructs: (βEBs =.-380, βMSS = .187, βLSE =.243). In addition, R^2 for the corresponding variables are (R^2 =.183, R^2 =.051, R^2=.042). The results of β and R^2 indicated that the theorized model is statistically significant. Figure 2 illustrates the unstandardized paths after correction.
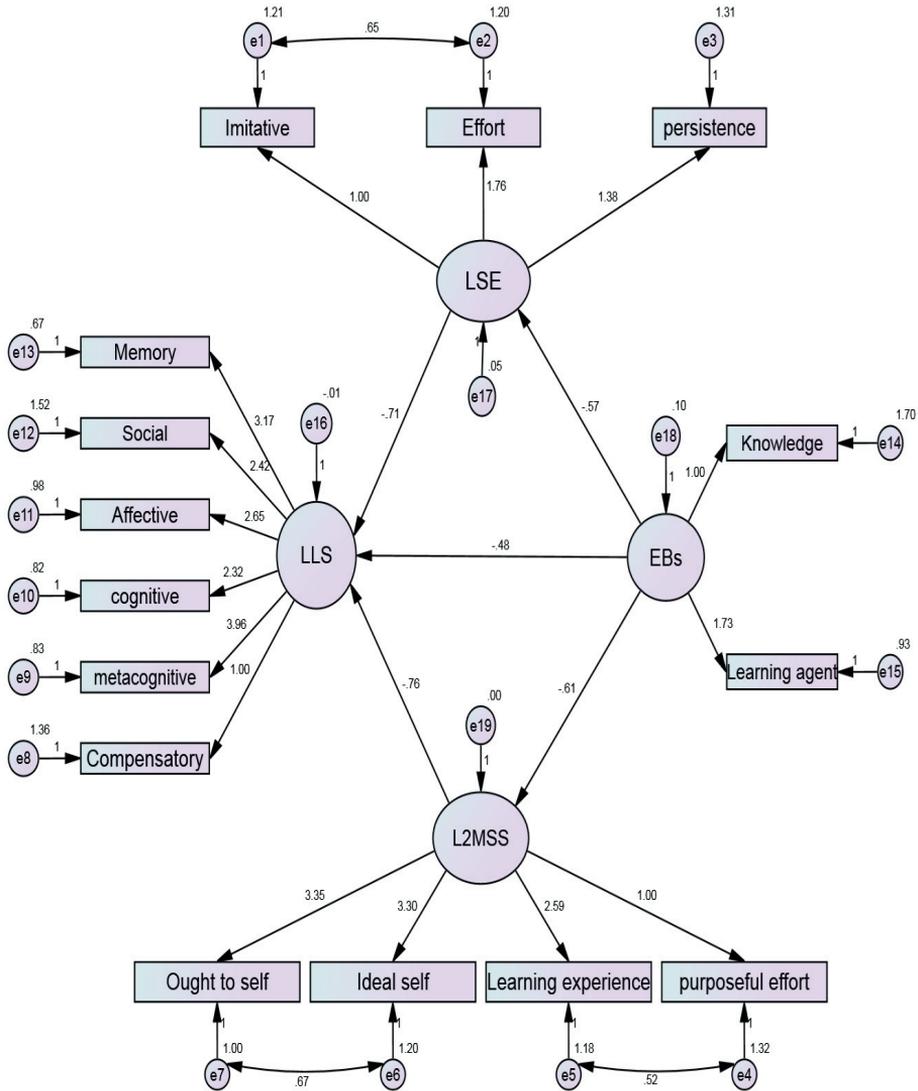
Figure 2. Unstandardized estimates of route coefficients in the conceptual model

Then, the standardized estimate of route coefficients was determined. The results are presented in the following figure.
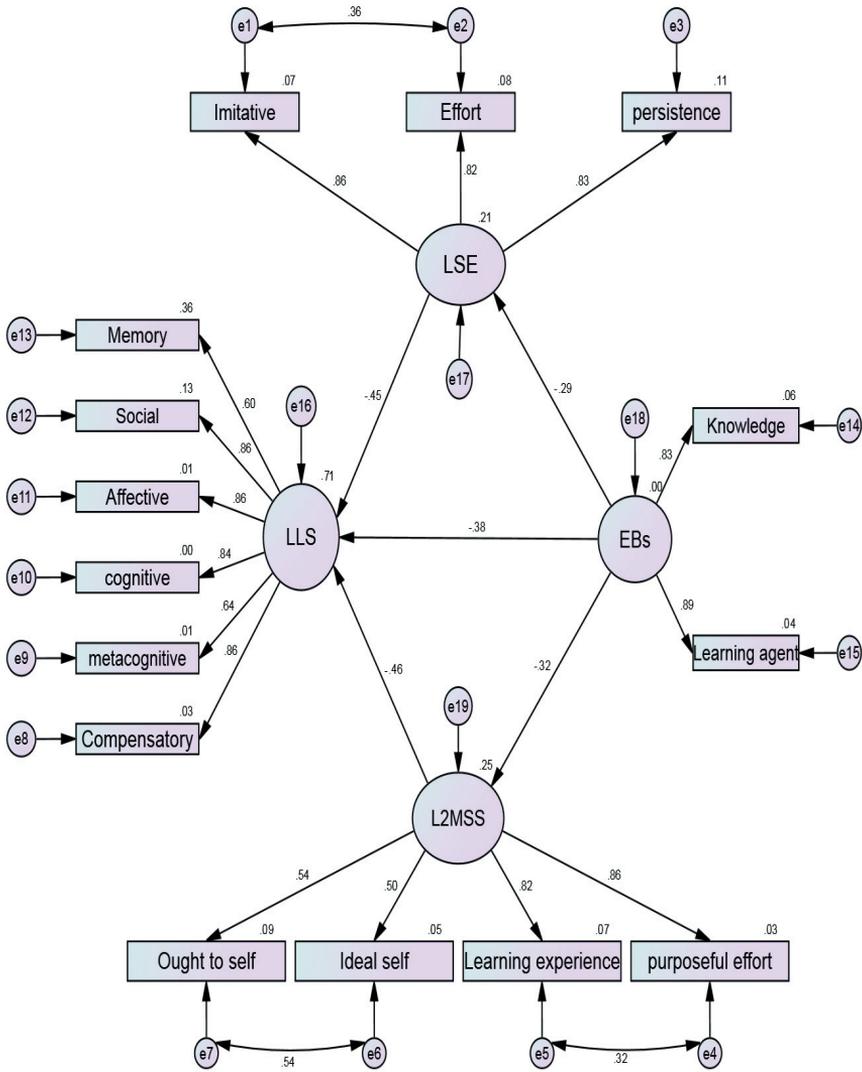
Figure 3. Final structural model for the standard estimates of route coefficients

Regarding the data obtained from three fit indices of AGF, CFI, and PFI, the R square came out to be ($R^2 = .71$) for the variables i.e., EBs, MSS, and LSE. This amount indicates that 71 percent of LLSs can be predicted by EBs, MSS, and LSE either directly or indirectly.

4.3. Analysis of the research question about gender difference

In order to investigate if male and female students are different in terms of EBs, MSS, and LLSs, Box test of equality covariance matrices, Levene's Test of Equality of Variances, and MANOVA was conducted. Table 3 indicates Box test.

Table 3: Box' M Test of Equality Covariance $Matrices^a$

Box's M	54.034
F	1.967
df1	15
df2	75421.360
Sig.	.421

a. Design: Intercept EBs; MSS

The null hypothesis for Box's test is that the observed covariance matrices for EB, MSS, and LLSs are equal across groups. Table 3 represents a non-significant test result (i.e., Box's M= 54.034, F = 1.96, $df_1 = 15, p > .421$). More specifically, p-value is above .05 showing that the covariance matrices are equal. Thus, the basic assumptions met for analyzing MANOVA. To check the assumption of homogeneity of variance, Levene's test of equality of variances was run (See, Table 4).

Table 4: Levene's Test of Equality of Variance among the Constructs

Constructs	Levene's Statistics	df1	df2	Sig.
EBs	.192	1	285	.211
LSE	.045	1	285	.904
MSS	2.175	1	285	.114
LLSs	.175	1	285	.754

As indicated in the Table 5 all variances are equal since p-value > 0.05. In other words, EB, LSE, MSS, and LLSs ($Sig. = .211, .904, .114, .754$) did not violate the homogeneity of variance assumption needed for an MNOVA. We can conclude that the error variance for both groups, male and female, is equal.

Table 5: Multivariate Testsa for Male and Female Students Constructs

Effect	Value	F	Hypothesis df	Error df	Sig.
Pillai's Trace	.127	11.484[b]	5	280	.000
Wilkins' Lambda	.873	11.484 [b]	5	280	.000
Hotelling's Trace	.146	11.484 [b]	5	280	.000
Roys'largest Root	.146	11.484[b]	5	280	.000

a.   Design: Intercept EBs, MSS, LSE, LLSs; b Exact Statistics

Table 6 indicates that the multivariate analysis for both groups of male and female students are significant ($p < .05$). In order to determine the multivariate analysis for EB, LSE, MSS, and LLSs in both groups, test between subject effects was run with respect to different variables in male and female groups.

Table 6: Test Between-Subjects Effects of the construct

Source	Variable	Group	Mean	Type III Sum of Square	Df	Mean square	F	Sig
	EB	Male	84.96	19673.342	1	19673.342	15.967	.000
		Female	78.64					
Model	LSE	Male	40.75	4512.8574	1	4512.8574	12.239	.000
		Female	42.31					
	MSS	Male	58.84	3654.857	1	3654.875	10.086	.000
		Female	65.11					
	LLS	Male	122.75	78104.608	1	78104.608	11.967	.000
		Female	133.69					

Tests of Between-Subjects Effects present the MANOVA results for be-tween -groups variable (i.e., male and female). As indicated in the Ta-ble 6 the main effect for male and female groups is significant $F_{EB} = 15.96$ $F_{LSE} = 12.23$, $F_{MSS} = 10.08$, $F_{LLS} = 11.96$, $p < .05$. Thus, there was an overall significant difference in the EB_s mean score of male (M = 84.96) compared to female (M = 78.64), LSE mean score of male (M = 40.75) compared to female (M = 42.31), MSS mean score of male (M = 58.84) compared to female (M = 65.11), and LLS mean score of male (M = 122.75) compared to female (M = 133.69). Particularly, female learners outperformed male with regards to LSE, MSS, and LLS_s. How-ever, male learners excelled females in reference to EB_s. Accordingly, the study concludes that there was a significant difference in EB_s, SE, MSS, and LLS_s of male and female students.

5. Discussion

This study probes direct or indirect relationships between male and female EB_s, LSE, MSS, and LLS_s. This puts into practice through the mediators of students' MSS and LSE. To undertake the study, a SEM approach was employed to examine the multivariate associations. The SEM approach integrates the power of path analysis to probe the interplay among various variables with the factor analysis to test the relationships between observed and unobserved variables, or the interplay among factors (Fornll & Larcker, 1981). For the purpose of this study, the target constructs are considered as latent variable and the component of the variables are regarded as observed variable. The basic objective of this research was to examine if EB_s, MSS, and LSE had a direct effect on LLS_s of male and female students. The secondary objective was to uncover the relationship among high school students' EB_s, MSS, LLS_s, and LSE. Finally, this study sought to probe if gender is a case in such a modeling approach. More specifically, this study aimed to test the difference between male and female students' EB_s, MSS, LLS_s, and LSE.

The first part of the directional research questions probes if EB_s with the mediating role of MSS, and LSE influences LLS_s among male and female students. The results of the hypothesized model demonstrated that EB_s could directly influence LLS_s. To undertake this line of research, MSS and LSE were considered as two mediators. The results showed that EB with mediating role of MSS and LSE negatively influences the components of LLS_s. More precisely, the findings suggested that EB_s negatively and indirectly influence EFL students learning strategy. The results showed that EFL students with the high level of EB_s employed less LLS_s. This finding is consistent with (Hofer, 2016; Hofer & Pintrich, 1997; Winberg et al., 2019) who found that EB_s students with high level of EB_s use less learning strategy. Likewise, some other practitioners concluded that learners' beliefs affect the type of strategies learners held in learning process (Chamot & Harris, 2019; Griffiths, 2018; Oxford, 2016; Winberg et al., 2019). Recently, some other studies (Cheng, 2020; Habk & Magyar, 2018; Liu, Yao, Li, & Zhang, 2020) confirmed the interplay between learners' beliefs and their academic success.

The second part of the directional research questions probes how learners' MSS, LSE affect students' LLS_s. The results indicated that 71 percent of LLS_s could be account for EB_s, MSS, and LSE directly or indirectly. As with the both constructs (i.e., MSS and LSE) a direct and positive correlation was found between EFL students MSS and LLS_s. Besides, direct and positive relationship was seen between LSE and LLS_s. The findings indicated that both MSS and LSE are the robust predictors of LLS_s. Specifically, the findings revealed that MSS could be a stronger predictor than LSE. This finding is consistent with (Shirzad et al., 2021) who found that students with high MSS employ more learning strategy. Shirzad et al. concluded that EB_s and LLS are associated in a negative direction, and MSS and LLS_s are connected in a positive direction. They found learners' beliefs and MSS influence EFL learners' learning strategies directly.

This finding echoes some empirical works (e.g., Chamot & Harris, 2019; Lila, 2016), which concluded that students with high motivation are more engaged and receive knowledge in a more coherent form, Likewise, (Papi et al., 2018) underscored the role of learners' motivation as the robust predictor of L2 learning experience. Besides, LSE was found to correlate directly and positively with the LLS_s. This result is in line with (Shirzad et al., 2021) who suggested that EFL teachers should foster LSE as it seems to affect language learning. They found that LSE can best predict LLS_s. This finding echoes (Bandura, 1986) theory of LSE. Bandura corroborated that LSE affects the learning conception. Besides various practitioners (e.g., Cheng, 2020; Lindner & Retelsdorf, 2020; Pajares, 2007) proposed a positive relationship between LSE and LLS_s. The results of their study acknowledged that LSE could positively predict LLS_s. Moreover, Heidarzadi et al., (2022) pinpointed the influential effect of learners' beliefs in generating effective writing. They concluded that LSE can foster the academic achievement. They have tested a model to uncover the impact of LSE in academic outcome and course fulfillment.

Another focus of this study was to examine if gender is a case in such a modeling approach. Specifically, this study sought to test the difference among male and female students' EBs, MSS, LLSs, and LSE. To probe

any gender differences, a SEM approach was conducted. The findings revealed that there was a significant difference in main variables of the current study (i.e., EBs, LSE, MSS, and LLSs) between male and female learners. Notably, the results corroborated that there was a gender difference in the finalized model and the way male and female learners performed with the respect of the target variables. The findings were noteworthy because the direct/indirect interconnection between male and female's EBs and LLSs through the mediators of MSS and LLSs were found. More specifically, the finding showed that male learners outperformed the females in terms of the EBs. However, female learners performed better than the male learners in MSS, LSE and LLSs. This finding confirmed Heidarzadi et al. (2022) who found that EBs with the mediating effect of LSE supposed to be an important variable in reducing learning strategy. This result supports some findings (e.g., Cohen, 2018; Fathi et al., 2019) which claimed that the use of LLSs depend on the way students feel to assess themselves as competent in their knowledge. Besides, the findings echo (Cheng, 2020; Liu et al., 2020) who proposed that male and female's LSE strategies are strong predictors of effort, persistence, and imitation. Overall, the findings revealed that EBs influences LLSs negatively and two other variables (i.e., MSS and LSE) influence LLSs in a positive direction.

6. Conclusion

This study concluded that all the constructs (i.e., EBs, LSE, and MSS) can influence learners' preference and the use of LLSs. The findings revealed that there is a negative interplay between EBs and learning strategy. Moreover, LSE, MSS and LLS_s are interrelated in a positive direction. Particularly, the current study suggests that the mediators (i.e., LSE and MSS) are among the main effective variables in the way learners adopt learning strategies. The statistical analysis of the data led the researcher to derive some implications for teaching, materials development, language policy makers, language teachers, and test developers. On the basis of the results and the conclusions of this study and with reference to experience gained during the completion of the

various stages of this study, a similar study can be replicated with different language proficiency levels to probe the interrelationships with different variables such as language skill anxiety, self-regulated learning, grit, and perfectionism, to name but a few.

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