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The Mediating Role of Reflective Thinking and Language Learning Motivation in the Relationship between Cultural Intelligence and Language Anxiety

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ABSTRACT

This study introduces a model to test the impact of cultural intelligence (CQ) on the listening anxiety. In so doing, reflective thinking (RT) and language learning motivation (LLM) were considered as the predictor roles. To examine the model, a non-experimental correlation research design was adopted. To collect the data, four scales, Ang et al. (2007) CQ, Kim's (2000) LA, Noels et al. (2000) LLM, and Kember et al. (2000) RT were distributed via Porsline online survey tool among EFL learners. Following Byrne (2010) guidelines for the sample size, a sample of 250 (n= 117 male and n=133 female) students were randomly selected using a cluster random sampling method at multistage from 23 language institutes. Notably, each student was asked to fill out four questionnaires. Thus, a total of 1000 questionnaires were disseminated digitally via the portal. In total, 815 questionnaires were collected but 185 cases were deemed invalid during the initial examination process. The SEM analysis was performed using the SPSS and AMOS 21 software packages. The results showed that CQ, RT, and LLM made significant unique contributions as the predictors of LA, with a predictive power of (R2 = .47). Specifically, CQ, RT, and LLM collectively accounted for 47% of the variance in LA through both direct and indirect pathways. Accordingly, teachers may consider enhancing learners' RT to foster listening skill. Besides, high level of CQ can help decrease anxiety in listening skills. The results and implications for reducing LA are further elaborated upon.

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Introduction

The Foreign language anxiety (FLA) has gained considerable attention and research focus in recent years (Anthoney & Wilang, 2023; Jin & Eng, 2024). The 1980s marked a significant turning point in the exploration of FLA. The challenge of learning the English language and its dialects can result in anxious conditions, known as "English language anxiety" (Dewaele et al., 2023). Originally, Horwitz et al. (1986) proposed the L2 classroom anxiety scale. Later, different types of FLA, such as speaking (Aubrey, 2022), reading (Wang et al., 2023), and writing (Heidarzadi et al., 2022), have been under investigation in L2 learning. Wheeless (1975) was the earliest practitioners who proposed FLA to describe "a receiver's apprehension, fear of misinterpretation, inadequate processing, or inability to adjust psychologically to messages sent by others" (p.263). Such anxiety may be experienced while learning a specific language skill (Thompson & Lee, 2014). An individual might feel stress and tension when speaking, listening to, or learning English (Hassanzadeh et al., 2022). MacIntyre and Gardner (1994) conceptualized FLA as the impression of nerves and apprehension related to second language (L2) contexts. Such feeling can be affected by motivation and learners' thinking process.

Various studies (e.g., Alamer, 2022; Barjesteh, 2019; Shahrakipour, 2021) have released evidence that reflective thinking (RT) and language learning motivation (LLM) plays a significant positive role in predicting learning achievement. Some other studies (e.g., Dörnyei & Ushioda, 2021; Hariri et al., 2021; Shirzad et al., 2020; Zaremarzoni, 2022) have indicated that L2 achievement is highly correlated with motivation. Such studies identified that learners' motivation and language achievement are positively and significantly correlated. Besides, various theoretical assumptions acknowledged motivation as a predictor of L2 achievement. For example, the *motivational process model* proposed by Alamer and Lee (2021) is comprised of different psychological factors drawn from the *achievement emotion theory* (Pekrun et al., 2009), *self-determination theory* (SDT) (Ryan & Deci, 2017), and *goal-orientation theory* (Murayama & Elliot, 2019) to elucidate L2 achievement. Recently, some research (Ang & Rockstuhl, 2021; Barjesteh & Ghasemnia, 2019; Goh & Vandergrift, 2021; Landry-Meyer, 2023) found that listening comprehension become vulnerable to the learners' social, cultural, cognitive and affective-related variables (i.e., motivation, culture, RT, and anxiety). Moreover, Li, and Dewaele (2021) explored the interplay among psychological and affective-related variables. Fathi et al. (2020) argued that learners should employ demanding process in listening because they need both linguistic and metalinguistic knowledge to understand the auricular information. Such an arduous process causes learners experience obstacles while they are listening to the target language (Ngo, 2019).

Moreover, previous research (e.g., Alamer, 2022; Barjesteh, 2019; Chamdani et al., 2022; Zare & Barjesteh, 2021) have released evidence that RT plays a significant positive role in predicting learning achievement. Barjesteh (2019) found that RT develops and evolves when students learn and respond to new experiences, situations, or events. Ozudogru (2021) described RT as the process of reflection on emotions, feelings, experiences, reactions, and knowledge. Moreover, there is substantial evidence (e.g., Ang & Van Dyne, 2008; Gedik Bal, 2022; Lambert Snodgrass et al., 2023; Sternberg et al., 2022) that recognizes the influential role of cultural intelligence (CQ) in advancing the attainment of L2 learning. Specifically, Ang and Van Dyne (2008) conceived CQ as a multidimensional trait in educational psychology that influence language learning as an external factor.

While preceding studies have showed that learners' RT and LLM may promote different language skills (reading, writing, and speaking), the relationship among LLM, RT, CQ and listening skill has yet to be tested. Therefore, this study probed how EFL learners perceive their FLA on CQ and RT. This study explicitly focused on the cognitive and capability aspects of listening comprehension, with the constructs explored being delimited to CQ, LLM, LA, and RT. Although a growing body of studies (e.g. Barjesteh & Ghasemnia, 2019; Ozudogru, 2021) explored the associations between RT, CQ, cognitive, metacognitive, as well as affective listening strategies (Barzykowski, 2019; Fathi et al., 2020), no single study has investigated the effect of CQ, RT, LLM on LA. Since the interaction between EFL learners' CQ and LA is not empirically supported, the current study aimed to unveil the theoretical interplay between the constructs. Initially, this study examined whether learners' CQ directly affects their listening anxiety. The secondary contribution of this study was to screen the indirect effect of RT on learners LA. Altogether, this study examined the extent to which RT and LLM mediate the predictive effect of CQ on the LA to fill the theoretical gap between the variables under study. Papi and Khajavi (2021) noted that the anxiety related learners' performance in L2 skills are commonly known as foreign language anxiety. Many teachers and practitioners believe that such anxiety impede language learning. Thus, knowing the latent factors underlying listening anxiety, and exploring the anxiety provoking factors in listening skill can promote listening performance. In the L2 professional literature, listening

skill is considered as an arduous, dynamic, and integrative activity which involves various mental task (Aubrey, 2022; Landry-Meyer, 2023; Li & Dewaele, 2021) and studies reported different psychological, situation-specific, and social factors that are anxiety provoking for listening comprehension.

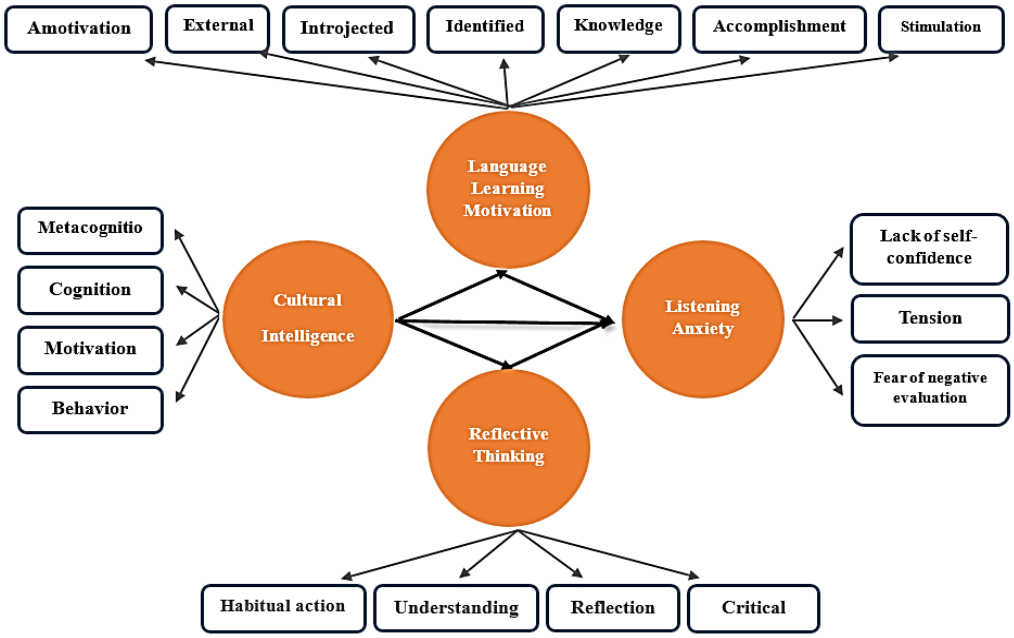
Dewaele and Dewaele (2020) classified learners' anxiety into micro-contexts (such as a particular sentence or task), meso-contexts (such as anxiety about the behavior of teachers or peers in the classroom), and macro-contexts (such as political and historical contexts). Such context plays an influential role in predicting language skill achievement, in general, and listening skill in particular. L2 professional literature listed various anxiety provoking factors in learning language skills as anxious learners experienced some thinking and cultural differences, and affective factors (e.g., palpitations, distraction, and confusion) while listening to L2 (Fathi et al., 2020; Ozudogru, 2021). Thus, understanding the relationships between LA, CQ, and RT may yield interesting implications in L2 listening. This study is significant due to the fact that it examined the predictors of listening anxiety in English courses. More specifically, the significant lies on testing a model based on CQ and reflective thinking. This study set out to establish an interplay among the constructs under examination, to investigate if CQ predicts LA with LLM and RT playing a mediating role. As a result, it has been proposed that CQ helps reduce LA, which subsequently enhances students' listening performance. Specifically, it is proposed that CQ directly affects LA. Despite the extensive literature (e.g., Ang et al., 2021; Lambert Snodgrass et al., 2023) confirming the efficacy of CQ, it was proposed that constructs under study have unpredictable associations. Additionally, these variables have been extensively studied in empirical research (e.g., Aubrey, 2022; Lambert Snodgrass et al., 2023; Ozudogru, 2021, among others). Therefore, exploring the direct or indirect relationships between these variables could yield intriguing results that address gaps in the current literature. Thus, the findings may be noteworthiness because the direct/indirect interconnection among CQ, LLM, TA and RT can yield exciting implication in the way such variables may affect LA.

Conceptual Framework of the Study

This study employed a non-experimental correlation research design to predict the sources of LA among EFL learners. In so doing, the findings of L2 professional literature (i.e., Early & Mosakowski, 2004; Kim, 2000; Noels et al., 20; Kember et al., 2000) were utilized as a hypothetical model to map the conceptual framework of the present study. From the theoretical assumptions, a conceptual LA model is prompted to develop. The research model is rather complex with four variables (i.e., CQ, RT, LLM, & LA) and 18 subscales. To formulate the theoretical basis of the study, one exogenous variable (i.e. CQ), two mediators (i.e., RT, LLM) and one endogenous variable (i.e, LA) were considered for the purpose of this research design (See Figure 1).

Figure 1

The Conceptual Model and the Interrelationship among the Variables



To undertake the study, the following research questions were addressed:

RQ1: How does reflective thinking mediate the predictive effect of cultural intelligence on students' English listening anxiety?

RQ2: How does language learning motivation mediate the predictive effect of cultural intelligence on students' English listening anxiety?

Method

Participants

This research was a descriptive correlational study using structural equation method. The statistical population of the present study consisted of 250 Iranian EFL students. The participants were both male (N=117) and female (N=133) EFL learners whose ages ranged from 16 to 23 (M = 17.12, SD = 5.32), with their learning experience ranging from 1 to 3 years (M=2.05, SD=4.26). The minimum sample size in SEM modeling approach is up to 10 cases per parameter (Byrne, 2010). For the purpose of this study, four constructs and a total of 18 sub-factors were investigated. Accordingly, a minimum sample size of 180 participants seemed to be justified. A total number of 250 populations was deemed to be appropriate because of the possibility of considering the incomplete questionnaires. This study used a cluster random sampling technique. Specifically, the sampling was adopted at different sampling multistage (i.e., cities, districts, language schools, major, gender, and age). To reduce the bias effect, the sampling multistage was randomly selected from 23 private English language institutes in three districts in Tehran and Karaj.

Instruments

To probe the interplay among the variables, the following scales were unutilized:

Cultural Intelligence Scale (CQS)

The CQS evaluates effective management in culturally diverse settings. Adapted from Ang et al. (2007), the scale includes self-report items (n= 20) across four components:

1. MECQS (4 items; i.e., In cross-cultural interactions, I apply cultural knowledge)
2. CCQS (6 items; e.g., The arts and crafts of other cultures are familiar to me)
3. MCQS (5 items; e.g., It has been a pleasure for me to live in cultures that are foreign to me.)
4. BCQS (5 items; e.g., depending on the cross-cultural situation, I vary my speaking rate)

CQS has undergone extensive validation, with literature suggesting its applicability in various settings (Barzykowski et al., 2019; Ghonsooli & Shalchy, 2013; Van Dyne et al., 2009). Factorial analysis confirmed the CQS's adequacy. Additionally, Ghonsooli and Shalchy (2013) adapted the CQS for the Iranian context, achieving a reliability coefficient of α = .87. The current study also analyzed reliability, finding high reliability for the CQS (α = .88) in a pilot study (n = 87).). For the subscale, the reliability coefficient was as follows: MECQS (α = .87), CCQS (α = .89), MCQS (α = .91) and BCQS (α = .86).

Listening anxiety scale

Kim's (2000) scale was used to check LA. Originally developed for Korean EFL students, the scale was validated with 452 learners. Confirmatory factor analysis identified three factors: (a) tension, (b) worry over English listening, and (c) lack of self-confidence. Kimura (2008) later revised these factors to emotional, cognitive, and anticipatory fear. This study employed a three-taxonomies (LSC, T, & FNE) with 33 items. The score varied from 33 to 165. In his study, Kim (2000) reported a reliability index of .93. A pilot study involving 68 EFL learners in Iran was conducted to examine the scale's reliability, resulting in a high reliability level (α = .76) with the following subscales: (a) LSC (α = .75), (b) T (α = .77), and (c) FNE (α = .76).

LLM Scale

To determine LLM, Noels et al. (2000) scale was employed. It comprises 21 items assessing three primary factors: external and motivation, as well as amotivation. The first construct is further divided into external, introjected, and identified regulation, each with 3 items. Similarly, the second construct is gauged through knowledge, mastery, and stimulation within 9 items. Amotivation is assessed with three items. A high score signifies a strong alignment between the proposed reasons for studying an L2 and the actual motivations. A factor analysis was run to test the construct validity, and across all subscales, the reliability index, ranging from .67 to .88, was acceptable (Noel et al., 2000). Precisely, the instrument has been proven to be both valid and reliable (α = .82) in assessing amotivation, ER (α = .75), and IR (α = .67), IDR (α = .84), IMK (α = .85), IMA (α = .88), and IMS (α = .85). For the current study, the Cronbach's alpha value was found to be (α =.82, N = 73) acceptable in EFL context of Iran.

Reflective Thinking Questionnaire (RTQ)

To measure students' RT, Kember et al. (2000) RTQ was employed. A five-point Likert scale was employed to evaluate 16 self-report items. The questionnaire contained four scales, including (1) HA, (2) U, (3) R, and (4) CR. Each subscale measures 4 items, ranging from 1 (completely agree) to 5 (completely disagree). Notably, HA (items 1, 5, 9, 13) is an activity has been learned previously without conscious attention. In U (items 2, 6, 10, 14), existing knowledge is used without appraisal In

the R process (items 3, 7, 11, 15), a concern is internally examined and explored. In CR (items 4,8,12,16), we are able to gain a greater understanding of why we perceive, contemplate, feel, and perform in the manner in which we do. Cronbach's alpha value was calculated (α = .66) to test the reliability of the scale. Kember et al. tested the final version of the RTQ among 303 students. The reliability of the scales was confirmed by acceptable Cronbach alpha values. Besides, the CFA indicated a good fit to the proposed four-factor structure. Azimi and Taghizadeh (2019) piloted the RTQ test (α =. 76; n= 636) in the context of Iran. RTQ was piloted with 68 EFL learners similar to those of the current study and the results of KMO revealed that RTQ enjoyed an adequate KMO of .73. Additionally, Cronbach's alpha reliability of the scale was estimated to be .79 for similar participants (n = 68).

Procedure

This study examined a model to uncover the factors affecting students' LCA. To collect the data, the researchers distributed a total of 1,000 questionnaires online using the Porsline platform. It lasted about 8 minutes to complete each scale. All individuals were invited to willingly participate in the survey. Initially, the goal of the study was explained to all the participants, and their consent to take part in the research was secured. Notably, they were notified that their response to the scales implied their consent and eagerness to take part in the study. A total of 815 questionnaires were retrieved, but 185 were deemed invalid during the preliminary analysis due to late replies, careless or failure to respond. Following the guidelines of Tabachnick and Fidell (2007), all random errors were eliminated. Specifically, all missing data and outlier values were identified at the preliminary step. At this stage, kurtosis and skewness, box were run. In so doing, a Mahalanobis Test was run to eliminate the outlier data in the development of linear regression model. Next, then normality of data was checked with Kolmogorov-Smirnov test. Additionally, few missing items were randomly assigned through the expectation– maximization (EM) algorithm. Consequently, the data analysis was run on the valid scales, resulting in a normally distributed set of valid responses suitable for developing the SEM measurement.

Data Analysis

To analyze the data, the SEM analysis was performed using the SPSS and AMOS 21 software packages. The SEM requires that different goodness-of-fit values are reported and evaluated in order to assess any model (Hu & Bentler 1999). Thus, two types of metrics (i.e., chi-square/degree of freedom ratio & goodness-of-fit index) were used in the analysis to predict the sources of La. Generally, there are three categories of approximation errors: Root mean square error (RMSEA), Tucker-Lewis index (TLI), and comparative fit index (CFI). In line with Bentler and Yuan (1999), values in the region of .95 shows a satisfactory model fit, while values around .90 may be appropriate. To be considered acceptable, the RMSEA should both be equal to or lower than .07. To verify the appropriateness of the model, the composite reliability and Pearson correlation matrix were used. Hair, et al. (2020) suggested that the acceptable ranges for values of such indices are $\chi 2$/ df <3, TLI>.95, GFI>.95, RMSEA<.06, and CFI>.9

Findings

Checking the Normality of Data

To test the impact of learners' CQ on LA, some preliminary steps were taken. Initially, the normality of the data was tested. (See Table 1)

Table 1
Descriptive Statistics and the Kolmogorov-Smirnov Test

Variable	M	SD	statistics	Sig.
M	13.53	2.32	.735	.652
C	18.72	2.87	.704	.704
MO	15.91	2.55	1.031	.238
BE	14.16	2.39	.792	.558
CQ	62.32	6.12	1.084	.191
HA	10.53	1.56	.732	.658
UN	9.20	1.21	1.151	.141
RE	11.76	1.67	.671	.759
CR	8.31	0.98	.774	.588
CT	39.80	4.47	.881	.419

Variable	M	SD	statistics	Sig.
LS	30.44	4.18	.959	.317
TE	22.51	3.77	.932	.351
FNE	5.09	1.01	.894	.401
AM	8.21	0.78	1.006	.264
ER	9.44	0.91	1.095	.182
IR	11.76	1.21	.851	.464
IRE	8.37	1.03	.989	.282
IMK	10.17	1.24	1.013	.256
IMA	9.85	0.88	1.159	.136
IMS	7.45	0.91	.768	.597
LLM	65.25	8.45	.717	.683
LA	58.04	6.82	.969	.305

Note: ME= Metacognitive; Co= Cognition; Mo= Motivation; BE= Behavior; CQ= Cultural intelligence; HA= habitual action, UN= understanding,
RE=reflection; CR=critical reflection; CT = Critical thinking; LSC= Lack of self-confidence; TE= Tension; FNE= Fear of negative evaluation; A= Amotivation; ER= External regulation; IDR= Identified regulation; IMK= Intrinsic Motivation knowledge; IMA= Intrinsic motivation accomplishment; IMS- Intrinsic motivation simulation

Table 1 indicates descriptive statistics of variables and subscales. To identify multivariate outlier data, Mahalanobis test was run. Mahalanobis' distance (MD) is a statistical measure of the extent to which cases are multivariate outliers, based on a chi-square distribution, assessed using $p < .001$.

Table 2
Outlier Detection with Mahalanobis Test and Effective Points

	Minimum	Maximum	Mean	SD
Mahalanobis	.411	65.332	17.034	3.112
effective points	.002	.001	.004	.003

Table 2 indicates K= 32.670; df =22-1, p<.005. The K value (i.e. 32.670) reveals that the variables the K value in Mahalanobis distance are considered to be the outlier. Besides, the minimum and maximum MD is (*Min*=. 411) and (*Max*= 65.332). It has been found that the subjects whose Mahalanobis number is higher than 32.670 should be removed and after the examination it was determined that 15 subjects had a Mahalanobis value higher than 32.670 after removing this number of data. The total number of data was reduced to 235 samples.

Table 3
Kolmogorov-Smirnov Test after Revision for Normality

Construct	Kolmogrove-Smirnov	
	Statistic	Sig.
Metacognition	.735	.652
Cognition	.704	.704
Motivation	1.031	.238
Behavior	.792	.558
Cultural intelligence	1.084	.191
Amotivation	1.006	.264
External Regulation	1.095	.182
Introjected Regulation	.851	.464
Identified Regulation	.989	.282
Intrinsic Motivation-Knowledge	1.013	.256

Construct	Kolmogrove-Smirnov	
	Statistic	Sig.
Intrinsic Motivation-Accomplishment	1.159	.136
Intrinsic Motivation-Stimulation	.768	.597
Language learning Motivation	.717	.683
Habitual action	.732	.658
Understanding	1.151	.141
Reflection	.671	.759
Critical reflection	.774	.588
Reflective Thinking	.881	.419
Lack of self-confidence	.959	.317
Tension	.932	.351
Fear of negative evaluation	.894	.401
Listening Anxiety	.969	.305

The results of Kolmograph-Smironov test indicates that several cases of sample data are non-normal. The Mahalanobis test was conducted for the definite normalization of the data and the deviant data were removed. Then, the assumptions for the normality of the data were met with a number of tests such as Kolgomorov-Smirinov, Mahalanobis test, Q-Q plot and P-P plot.

Table 4
KMO and Bartlett Test Results

	KMO	Bartlett	Sig.
Value	.867	254660.533	.001

Table 4 indicates that the KMO statistic is .867, so the sample size is sufficient for factor analysis. The significance value of Bartlett's test is also .001, which shows that the results are significant. Overall, after assessing and addressing the normality of the data, it can be determined that the data were currently considered to be normally distributed, allowing for inferential analysis to be conducted on the data.

Table 5

Correlation Matrix of CQ, RT, L

C	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
ME	1																				
C	69**	1																			
M	77**	72**	1																		
B	66**	60**	75.	1																	
CI	81.**	79.	78**	80**	1																
A	24**	17**	19**	18**	20**	1															
ER	18**	22**	20**	20**	21**.	61.**	1														
IR	21**	19**	17**	16**	25**	59**	69**	1													
IDR	17.**	20**	19**	22**	22**	70**	63**	64**.	1												
IMK	19**	21**	18**	19**	25**	64**	57.**	68**	62**	1											
IMA	22**	17.**	21**	18**	27.**	72**	65**	70**	66**	61**	1										
IMS	18**	22**	18**	21.**	29**	68**	64**	62**	74**	64**	51**.	1									
LLM	28**	25**	22**	26**	33**	77.**	71.**	75**	80**	69**	70**	66**.	1								
HA	20**	19**	22**	21.**	24**	17.**	21.**	16**	23**	19**	17.**	24**	28**.	1							
U	17.**	15**	21.**	14**	21.**	15**	19**	22**	19**	22**	22**	22**	25**	64**.	1						
R	22**	18**	17.**	19**.	23**	19**	20**	18**	21.**	21.**	19**	19**.	29**	68**	62**.	1					
CR	19**	17.**	18**	18**	25**	21.**	18**	21.**	24**	24**	21**.	23**	22**	70**	72**	63**.	1				
RT	24**.	21.**	22**	25**	29**	22	22**	24**	27.**	25**	23**	26**	31.**	73**.	84**	72**	77**.	1			
LSC	-18**	-17.**	-19**	-22**	-24**	-21.**	-19**	-20**	-17.**	-23**	-24**	-23**	-22*	-19**	-20*	-18**	-19**	24**	1		
T	-22**	-19**	-22**	-18**	-28**	-17.**	-16**	-22**	-21**	-25**	-22**	-24**	-30**	21.**	-15**	-21.**	-23**	29***	63**.	1	
FNE	-17.**	-20**	-17.**	-22**	-26**	-22**	-14**	-18**	-19**	-21.**	-18**	-21.**	-28**	-18**	-19**	-17.**	-21.**	-26**	63**	66**.	1
LA	21.**	24**	-20**	-24**	-35**	-25**	21.**	-24**	-22**	-26**	-23**	-26**	-33**	-22**	-20**	-23**	-25**	-30**	81.**	74**	86**

Note: 1= Metacognitive; 2= Cognition; 3= Motivation; 4= Behavior; 5= Cultural intelligence; 6= Amotivation; 7= External regulation; 8= Identified regulation; 9= Identified regulation

10= Intrinsic motivation knowledge; 11= Intrinsic motivation accomplishment; 12= Intrinsic motivation simulation; 13 Language learning motivation; 14= habitual action, 15= understanding,

16=reflection; 17=critical reflection; 18= Reflective thinking; 19= Lack of self-confidence; 20= Tension; 21= Fear of negative evaluation;

The data presented in Table 5 indicates a notable connection between the RT and LA. Moreover, it shows that there is a significant negative correlation between the variables of CQ, LLM and LA. Besides, a positive association was discovered between total CQ and LA (r =-.35, p<.01). The results of Pearson correlation test also indicated a favorable relation between total LLM and LA (r=.-.33, p<.01). Similarly, a significant association was found between RT and LA (r =-.30, p<.01). All together, the results of the Pearson correlation test indicated that the correlation coefficient between total CQ and LA, and the correlation coefficient between total language LLM and LA was higher than that between RT and LA. Next, to analyze the fitness of the conceptual model, SEM analysis was run (See Table 6).

Table 6
The Fit Indices Obtained after Two Steps of Correction

Indicator	Values obtained modification
χ2/df	2.564
RMSEA	.039
GFI	.999
AGFI	.989
NFI	.997
CFI	.996
TLI	.991
RFI	.989
PNFI	.487
DF	189

The RMSEA value is .039, which is less than 0.1, indicating that the mean squared errors of the model are suitable and the model is acceptable. Additionally, the chi-square to degrees of freedom ratio (2.564) falls between 1 and 3, and the GFI, CFI, and NFI indices are all nearly equal and greater than .9, demonstrating that the measurement model for the research variable is appropriate.

Table 7
Weighted Regression Statistics and Critical Ratios for the Constructs

Exogenous variable	Direction	Endogenous variable	b	β	R^2	t	P
CQ	➔	Listening Anxiety	-.452	-.337	-.337	4.54	.001
RT	➔	Listening Anxiety	-.377	-.274	-.274	3.77	.001

Note: b=unstandardized effect; β= standardized effect

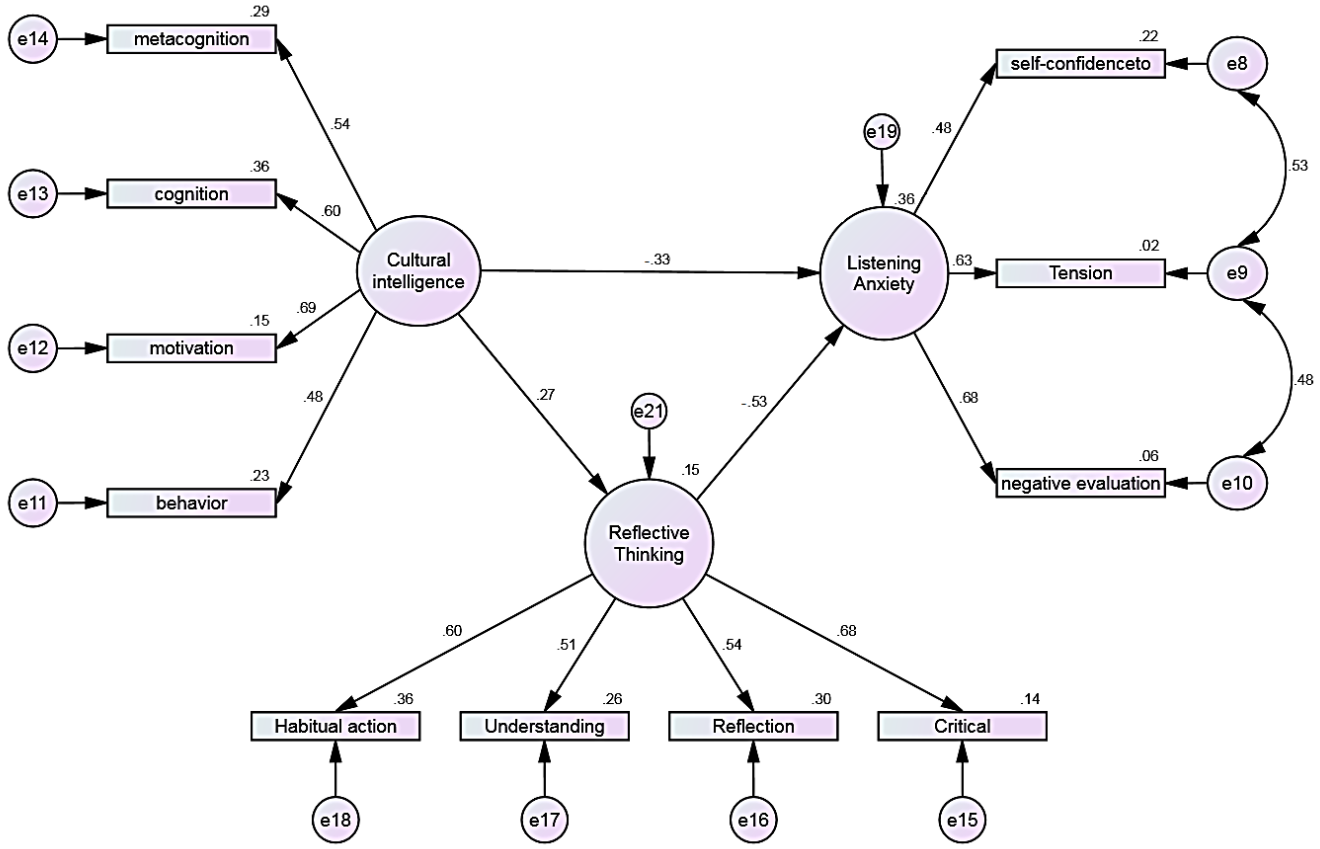
Table 8 shows the prediction path values from the variable, based on the t-values obtained in the model. Overall, all the values are statistically significant, indicating meaningful predictions.

Table 8
Indirect Model Estimation Using the Bootstrap Method

Variable	B	R^2	lower limit	upper limit	Sig.
CQ and LA with RT playing a mediating role	-.534	.361	-.597	-.412	.001

Based on Table 8, it is evident that the indirect paths, as indicated by the standardized values (β), confirm the relationship between CQ and LA with RT playing a mediating role. This confirmation was achieved through the bootstrap estimation method at a significant level.

Figure 2
The final Model of the Tested Paths with the Prediction Statistics



To probe the effect of CQ on LA with LLM playing a mediating role, a SEM analysis was conducted (See Table 9).

Table 9
The Fit Indices after two Steps of Correction

Indicator	Values obtained modification
χ2/df	2.478
RMSEA	.037
GFI	.999
AGFI	.991
NFI	.999
CFI	.998
TLI	.993
RFI	.993
DF	202

The RMSEA value is .037, which is below .1, indicating that the model's mean squared errors are within an acceptable range. Additionally, the chi-square value for the degrees of freedom (2.478) falls between 1 and 3, and the GFI, CFI, and NFI indices are all approximately equal and above 0.9. This demonstrates that the measurement model for the research variable is suitable.

Table 10
Regression and Critical Ratios of the constructs

Exogenous variable	direction	Endogenous variable	b	B	R^2	t	P
CQ	➔	Listening Anxiety	-.452	-.337	.152	4.546	.001
LLM	➔	Listening Anxiety	-.394	-.297	.117	3.978	.001

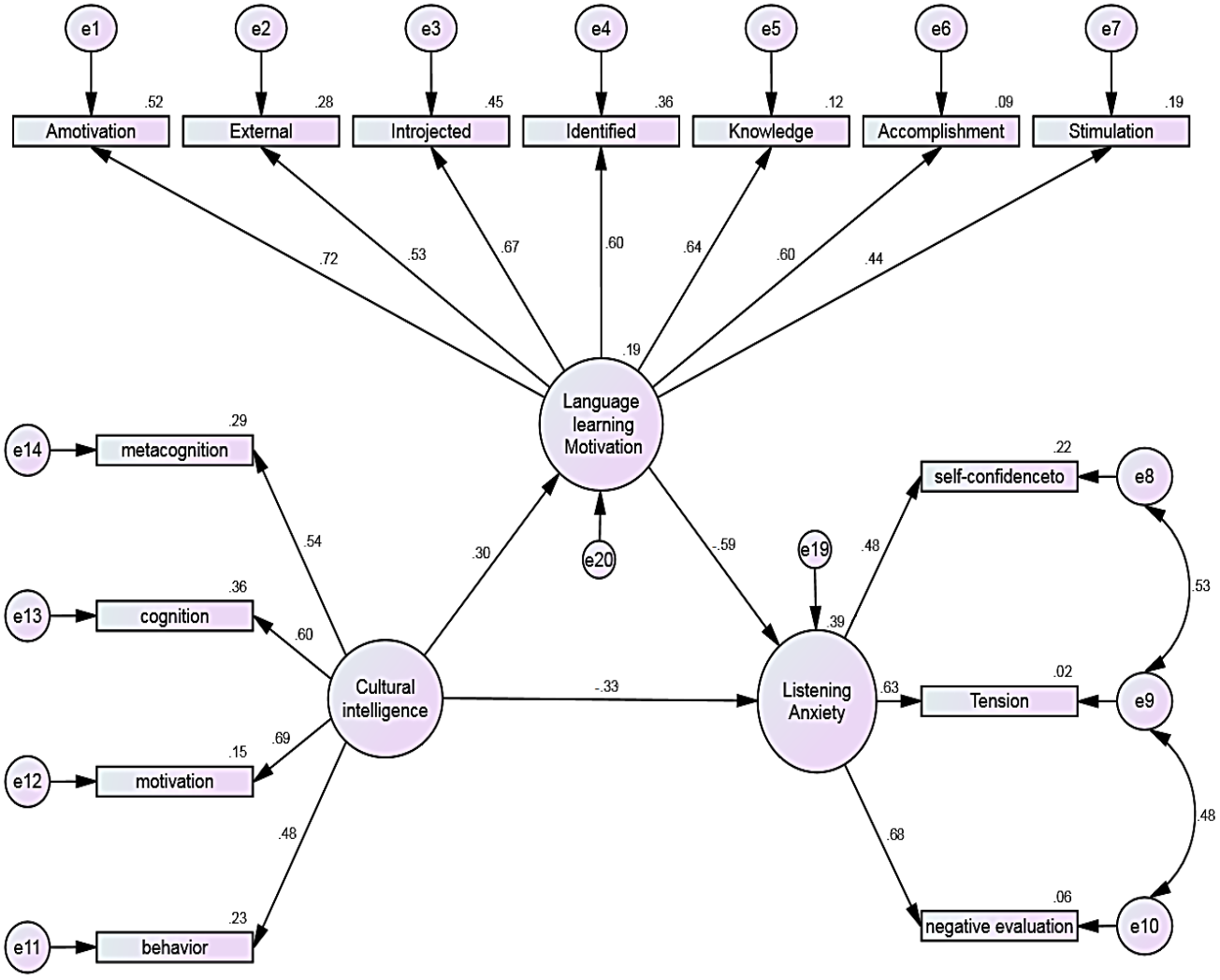
Table 10 displays the values of the prediction paths between the variable based on the t-values obtained from the model. Overall, all the values are significant, indicating meaningful prediction.

Table 11
Indirect Model Estimation using the Bootstrap Method

Variable	B	R^2	lower limit	upper limit	Sig.
CQ on LA with LLM as the mediator	-.592	.393	-.641	-.453	.001

Table 11 shows that the indirect paths, based on the standardized values (β), confirm the indirect effect of CQ on LA through the mediating role of LLM. This confirmation is according to the bootstrap estimation method and is significant at the specified level.

Figure 3
The Final Model of the Tested Paths along with the Standardized Prediction statistics



To test the direct impact of CI, LLM, ad RT on students' LA, MLE was used. MLE is a method for estimating distribution parameters by maximizing a likelihood function, ensuring that the observed data is most probable under the assumed statistical model (Richard, 2018). Table 12 presents the MLE results for LA.

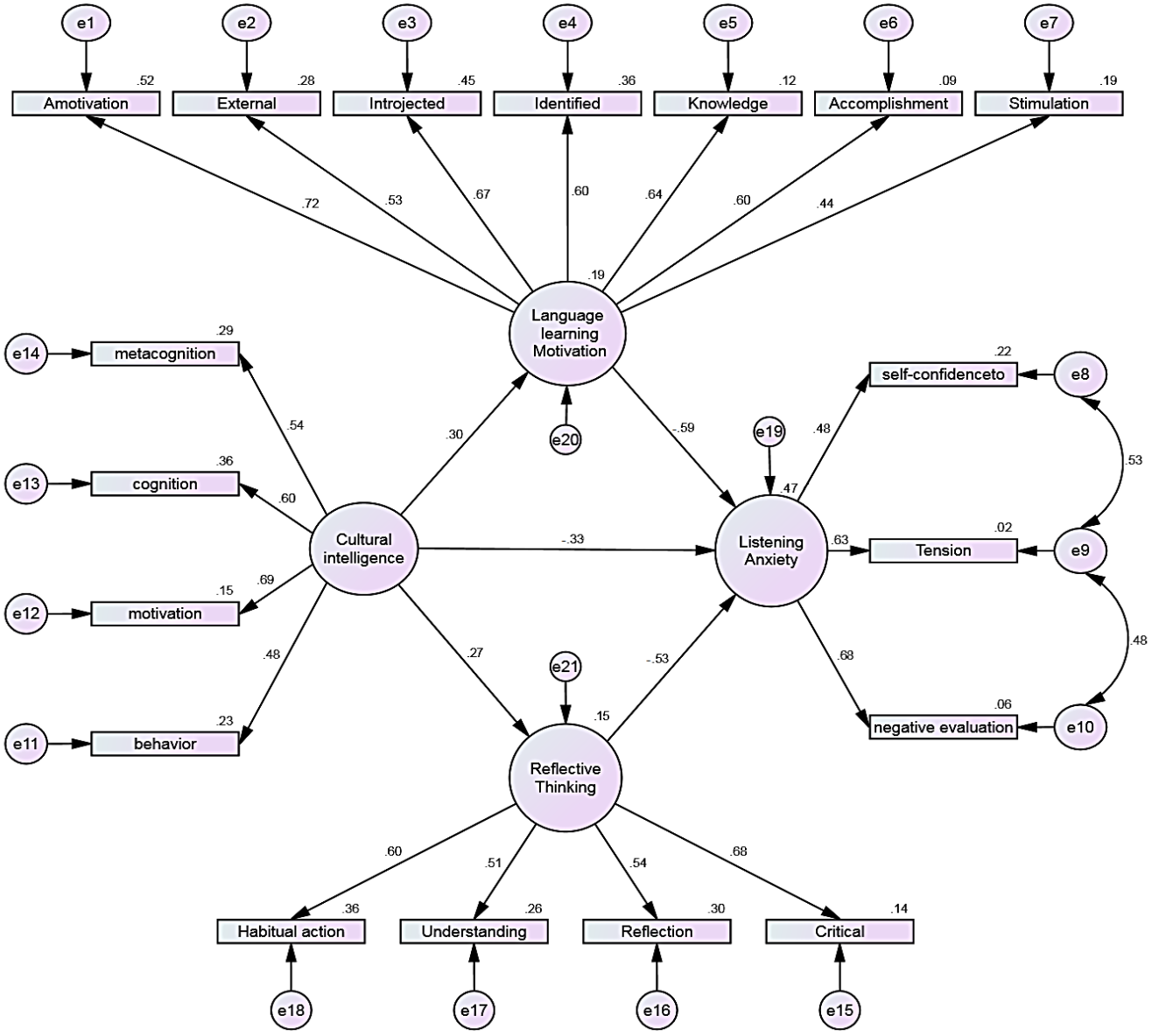
Table 12
Direct Maximum Likelihood Estimation on LA

Variable	b	β	R^2
CQ	-.452	-.337	.152
LLM	-.394	-.297	.117
RT	-.377	-.274	.103

The results of β and R^2 analysis indicate that the models are statistically significant. The direction of the results obtained from the measurement model and the final model of the research can be drawn between the obvious and hidden variables. Therefore, the conceptual model was confirmed.

Figure 4
Final Model with Respect to Constructs and Predicted Values

*p < .05; **p < .001.



The findings suggest that the conceptual model was validated. Specifically, the external variables show predictive strength (R2 = .47) for LA. These results highlight the important individual roles of CQ, RT, and LLM as the predictors of LA. Together, CQ, RT, and LLM explain 47% of the variability in LA through both direct and indirect pathways. Besides, the Beta coefficient table was analyzed to determine which

independent variables, such as CQ, RT, and LLM, had a greater impact on increasing LA. The beta coefficient for CQ was .337, indicating that it was the most significant factor in increasing LA. In fact, CQ emerged as the primary predictor of EFL learners' LA.

Discussion

This study investigated how RT and LLM mediate the impact of CQ on students' English listening anxiety. The findings indicated that CI, RT, and LLM serve as the predictors of LA, with CQ being the primary predictor of EFL learners' LA. Data revealed significant relationships between the variables, showing a negative association among the main constructs. The findings suggested that high levels of CQ and motivation help reduce listening anxiety among students. Notably, Iranian EFL learners with high CQ scores demonstrated greater listening abilities. Additionally, highly motivated students showed lower anxiety levels in listening skills, suggesting that students with higher CQ and motivation excel in their listening abilities. These results align with some studies (e.g., Horwitz et al., 1986; MacIntyre & Gardner, 1994) that have examined factors influencing L2 listening anxiety. The findings support the trilateral theoretical framework of LCA, conceptualizing anxiety through psychological, context-dependent, and social dimensions.

The second research question explored the extent to which LLM influences students' listening anxiety. In this study, LLM was predicted by the seven dimensions, indicating that highly motivated students experience less anxiety in listening skills. These findings align with theoretical propositions (e.g., Dörnyei, 2005; Ryan & Deci, 2017) emphasizing motivation's significant role in L2 attainment. The study used seven sub-scales for motivation, revealing that external, identified, and internal regulation, as well as intrinsic motivation for accomplishment, amotivation, and intrinsic motivation for simulation and knowledge, were important for reducing listening anxiety. These results are consistent with other studies in the literature (Alamer & Lee, 2021; Vallerand, 1997, Gardner & MacIntyre, 1994; Murayama & Elliot, 2019), which recognized the impact of motivation. The study confirmed that motivation influences learners' perceptions toward learning. This study also argued that listening and motivation are correlated, echoing previous findings on the positive association between orientation toward learning. The findings of some studies (e.g., Alamer & Lee, 2021; Murayama & Elliot, 2019) have confirmed that student motivation enhances L2 achievement. Similarly, this analysis highlighted the significant roles of external, identified, and introjected regulation.

External regulation was found to be the strongest negative predictor of listening anxiety, followed by identified and internal regulation. The possible explanation is that regulated learning involves a dynamic process where students should manipulate different processes to achieve their goals (Zimmerman & Kitsantas, 2002). Zimmerman and Kitsantas (2002) classified such dynamic process as social, cognitive, affective, and motivational aspect. This result supported Zimmerman (1986) stating that self-regulated learning can facilitate academic achievement. The findings are also in line with those of Heidarzadi et al. (2022) who found that self-regulated learning promotes students' language skills. The findings of this study revealed that external and identified regulation are essential in reducing LA. The findings suggest that higher levels of such regulation enhance listening efficacy and may help alleviate listening anxiety. SDT posits that learners' sense of competence can boost their orientation for continued learning (e.g., Alamer, 2022).

In terms of intrinsic motivation, the findings showed that some cub-factors such as accomplishment, simulation, and knowledge were identified as predictors of anxiety. Greater feelings of such sub-factors in learning language skills can motivate learners to improve their language abilities. This suggests that students with high intrinsic motivation are more efficient in listening performance. However, some limitations should be attended when interpreting the findings. First, although both male and female participated in this study, there was no consideration of gender in the analysis. Another study may be conducted to see whether similar results will be obtained for male and female learners. Second, all the participants were selected from different private language institutes. It is important to exercise caution when interpreting the results in different contexts due to this restriction on the sampling procedure. Finally, this study was conducted using a SEM approach, a replication of the same study may be conducted using log linear modeling to examine the causal relationships among the mains constructs of the present study.

Conclusions

The results showed that students with high motivation and CQ tend to have lower anxiety levels during listening comprehension. Motivation was found to be a stronger predictor than CQ Besides, RT as the mediator appears to enhance the negative association between the three sub-scales of CQ and LA. It seems that CQ, RT, and LA are significantly negatively related. The findings showed that both RT and CQ uniquely contributed to LA. However, RT emerged as a stronger predictor of

LA, indicating that a high level of RT enhances students' listening comprehension. Therefore, teachers may consider enhancing their RT to foster their students' listening skill when teaching EFL. The research findings indicated that a high level of CQ can help decrease anxiety in listening skills. Therefore, teachers should understand the factors related to CQ that can cause anxiety in listening comprehension. The findings of this study are important for language educators, teachers, and materials developers. Factors such as external and identified regulation, intrinsic motivation, simulation, and knowledge were identified as significant predictors of reduced listening anxiety. By fostering intrinsic motivation, it is possible to reduce anxiety levels in the classroom. Additionally, the role of culture was highlighted, with motivation, metacognitive skills, cognition, and behavior being significant predictors of reduced anxiety.

Based on the positive outcomes and educational significance, further research is required to explore the influences on FLLA. Drawing from the insights gained throughout this research, recommendations for future studies have been put forward. Subsequent research could investigate the factors predicting FLLA on a national scale, encompassing diverse English language institutions and schools. These studies should be conducted meticulously, taking into account various variables like students' educational levels (e.g., BA, MA, or PhD), age, gender, and cultural backgrounds. As the main concerns of this study were based upon testing a model, the SEM approach was employed. Therefore, a non-experimental correlational design was adopted due to the nature of the study. As far as the limitations of the study are concerned, it is acknowledged that the findings of such explanatory study cannot prove causal dependencies. Therefore, in order to obtain more reliable findings on the same constructs, future research design may be employed with experimental and control groups to uncover the cause and effect factors. The generalizability of these findings can be enhanced if future researchers utilize qualitative or mixed methods research designs with different validated scales. Such studies are likely to provide a more in-depth understanding of the predictors of FLLA in the EFL context. Future studies can examine the interrelationships with different variables such as speaking anxiety, reading anxiety, writing anxiety. Besides, it can be conducted with different proficiency levels such as beginner, intermediate, and advanced. Another potential area for future research involves examining the reflective levels of EFL learners and their use of learning strategies, as well as exploring how RT and LLM contribute to their strategy use (including cognitive, socio-affective, and metacognitive strategies). The current SEM modeling approach could be applied in an English for Specific Purposes course to validate the results, or a comparative study could be conducted to investigate differences between ESP and English for general purposes. This study could be replicated to confirm the findings with diverse groups of students, such as those studying psychology or sociology, using additional methods like face-to-face interviews or focused group interviews.

Author Contributions

All authors contributed the process of writing, data collection and revising the paper.

Ethical considerations

Participants were informed that by responding to the scales, they were indicating their consent and willingness to participate in the study.

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Conflicts of interest

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