Iranian EFL Learners' Online Self-Regulated Learning, Use of Communication Strategies, Test Anxiety, and Online Speaking Test Performance: A Structural Equation Modeling Approach

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ARTICLE INFO	ABSTRACT
	The obligatory prevalence of online education during the COVID-19 pandemic has drawn researchers' attention to the challenges involved in foreign language pedagogy in such virtual educational contexts. Against this backdrop, this study investigated the impact of online self-regulated learning, use of communication strategies, and test anxiety on Iranian English as a Foreign Language (EFL) learners' online speaking test performance. For this purpose, 132 EFL learners were given the e-Oxford Quick Placement Test and the speaking part of a sample A2 Key and B1 Preliminary test. Next, translated versions of the given measures were administered to the pre- and intermediate EFL learners and the obtained data were subjected to Structural Equation Modeling analyses that verified strong links between online self-regulated learning and the use of communication strategies, test anxiety, and online self-regulated learning, and test anxiety and EFL learners' use of communication strategies. Furthermore, the direct impacts of online self-regulated learning and use of communication strategies on learners' online speaking test performance were verified; however, test anxiety was found to indirectly impact the learners' online speaking test performance through its negative effect on EFL learners' online self-regulated learning and use of communication strategies. In addition, online self-regulated learning turned out to be the strongest predictor of the learners' online speaking test performance. As for the implications of the findings, it appeared that the attested model lends support to Bachman and Palmer's (1996) language use framework illustrating test performance as a vulnerable construct affected by test takers' attributes and features of the test tasks and the impact of construct-irrelevant factors like test takers' personal characteristics on their test performance.

1. Introduction

The abrupt conversion of educational procedures from face-to-face in-person mode to virtual online mode that took place primarily due to the unprecedented outbreak of the COVID-19 pandemic, led Teaching English as a Foreign Language (TEFL) researchers among other educationalists to focus on the challenges and obstacles of online English language testing, teaching, and learning (e.g., Amirian et al., 2023; MacIntyre et al., 2020; Maican & Cocorada, 2021; Momeni, 2022; Moser et al., 2020). Among the most frequently identified challenges of foreign language education in the online context, English as a Foreign Language (EFL) researchers have referred to the decreased level of learner-learner and learner-teacher interactions (Heckel & Ringeisen, 2019; Maican & Cocorada, 2021). Given that

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different forms of symmetric and asymmetric interactions are quite essential for the development of second or foreign language skills (Ahmadi Safa & Motaghi, 2024; Beheshti & Ahmadi Safa; 2020), the development of speaking skill as the most test anxiety-provoking skill (Ariamanesh et al., 2023; Goh & Burns, 2012; Horwitz et al., 1986; Zhang, 2019) seemed to be adversely affected. Such a condition calls for intensified development of the learners' online self-regulatory strategies (Barnard et al., 2008; Broadbent & Poon, 2015; Cho et al., 2017; Karbakhsh & Ahmadi Safa, 2020; Zheng et al., 2018) to mitigate the negative received impacts.

On the other hand, researchers have both theoretically justified and empirically confirmed the close ties between self-regulated learning, language learning strategies encompassing communication strategies (Oxford, 2017; Oxford & Pawlak, 2018; Zimmerman & Moylan, 2009), and different forms of anxiety including test anxiety (MacIntyre & Gregersen, 2012; Zimmerman, 1989). Communication strategies and test anxiety have also been confirmed to affect language learners' speaking test performance (Bachman & Palmer, 1996; 2010).

Given that what propels the majority of EFL learners to acquire a second or foreign language is a vision of being an articulate English speaker (Luoma, 2004; Pawlak, 2018; Scrivener, 2011; Souzandehfar, 2024), it is not surprising to note that the study of the aforementioned variables affecting emergency online speaking test performance has hardly received the researchers' attention in online learning contexts. Further, even the limited number of studies that have dealt with the interrelations among such individual difference variables including test anxiety, self-regulated learning, communication strategies, and speaking skill (e.g., Broad, 1999; Griffiths & Soruç, 2020) have underscored the significance of follow up similar studies which might help to clarify different aspects of learning in online learning contexts. On such a basis, the present study sought to explore the path analytic relations among online self-regulated learning, test anxiety, use of Communication Strategies (CSs), and online speaking test performance of EFL learners.

2. Review of Literature

In an attempt to situate the study in the context of the related literature, a brief description of the theoretical underpinnings of the study variables, and a brief overview of the most seminal and/or recent empirical studies on the same variables are in order in this part. It needs to be mentioned that to the best knowledge of the researchers, only a limited number of studies were found to explore the path analytic relations of all of the present study variables simultaneously. On this basis, attempts are made to briefly describe the studies that share the most number of variables with the current study and were designed and conducted on the basis of a common theoretical disposition (i.e., Bachman & Palmer, 1996).

2.1. Self-regulated Learning

Grounded in educational psychology, the notion of self-regulated learning ascribed to understanding individual differences in learning (Dörnyei & Ryan, 2015; Zimmerman, 2002) has been described as the learners' proactive use of cognitive, metacognitive, affective, behavioral, and environmental processes to attain academic achievements (Brown, 2014; Dörnyei & Skehan, 2003; Zimmerman & Schunk, 2011). Studies have confirmed self-regulated learning as a critical factor in predicting language learners' use of effective language learning strategies (Erdogan, 2018), academic performance (Theobald, 2021), test performance (Cleary et al., 2008), and even online course satisfaction (Wang et al., 2013).

From a theoretical perspective, as most self-regulated learning models indicate (e.g., Pintrich, 2000; Winne & Hadwin 2008; Zimmerman, 2013), the process of self-regulation is a cyclical three-phase mental activity. The three-phase mental activity comprises preparatory, performance, and appraisal/self-reflection phases (Panadero, 2017).

During the preparatory phase or what Zimmerman and Moylan (2009) call the forethought stage, the learners opt for a precise plan of what and how they intend to learn. At this stage, motivated learners analyze the tasks, set goals, and strategically plan to attain their learning goals (Chiu et al., 2023; Sasaki et al., 2018). The performance phase signifies the processes occurring during learning in which learners strive to put their predetermined plans into ongoing actions (Ziegler, 2014). At this phase, relying on metacognitive strategies the learners direct the affective, cognitive, and environmental

aspects of their learning toward the attainment of predetermined goals (Zimmerman, 2013). Having applied performance phase processes, high self-regulated learners employ more efficient strategies and self-observe their adopted techniques and learning outcomes (Zimmerman & Kitsantas, 2005). In the appraisal or self-reflection phase that encompasses self-judgment and self-reaction (Zimmerman, 2008), learners self-evaluate their performance (Schunk, 2005). Then, they attribute their success/failure to controllable/uncontrollable factors (Shores & Shannon, 2010). Such an attribution results in different levels of self-satisfaction (Eom, 2019) and constructive/destructive inferences (Dorrenbacher & Perels, 2016), which in turn influence upcoming preparatory processes (Zimmerman, 2013).

Studies have documented the effects of self-regulated learning on some aspects of online learning. For instance, Chiu et al. (2023) conducted an experimental study with 123 adolescent EFL learners to investigate the effects of teacher support and students' self-regulated learning to learn English with a chatbot in Hong Kong. The results showed that both teacher support and EFL learners' ability to self-regulate their learning play roles in enhancing language learning achievement. Broadbent (2017) compared the adopted self-regulatory learning strategies of online and blended Australian university students and explored the relationship between the aforesaid strategies and academic performance. The results verified time management and effort regulation as predictors of academic achievement in both groups, which in turn were adopted more frequently by online learners compared to the other group. Eom (2019), also examined the relationships among self-regulated learning, learners' satisfaction, and perceived learning achievement in courses delivered online and found strong predictive relationships among the variables.

Notably, Ramire-Arellano et al. (2018) presented a model of strong causal associations between motivation, self-regulated learning (cognitive and metacognitive strategies), negative emotions (anxiety, boredom, and frustration), learning strategies, and Mexican blended learners' overall grades. Lastly, Erdogan (2018) vividly confirmed the association between Turkish EFL learners' self-regulation and the use of language learning strategies, a finding which lends support to Oxford's (2017) argument concerning the link between self-regulated learning and the use of communication strategies as a subcomponent of language learning strategies (Oxford, 1990).

2.2. Communication Strategies

Deeply rooted in the heart of communicative competence models (e.g., Bachman & Palmer, 1996; Canale & Swain, 1980), communication strategies (CSs) are defined as "the ways in which an individual speaker manages to compensate for the gap between what s/he wishes to communicate and her immediately available linguistic resources" (Faucette, 2001, p.1). CSs have been approached from two interactional and psycholinguistic perspectives. According to Nakatani and Goh (2007), the former puts an emphasis on the learners' employed strategies while interacting with interlocutors to negotiate their intended meaning and enhance communication effectiveness, whereas the latter has an eye on various mental processes language learners undergo to solve communication problems.

Although CSs are approached from the two aforesaid diverging perspectives leading to the proposition of several taxonomies (e.g., Brown, 2014; Celce-Murcia et al., 1995), they can be grouped into two main categories, namely, achievement strategies and avoidance strategies (Dörnyei & Scott, 1997). Resorting to achievement strategies (e.g., circumlocution, approximation, and word coinage), EFL learners seek goal attainment. On the other hand, by applying avoidance strategies (e.g., topic avoidance and message abandonment), they surrender to their incompetent selves (Celce-Murcia et al., 1995).

Studies on the possible effects of the application of CSs on the development of speaking skill are most frequently carried out in traditional (in-person) learning contexts. Nakatani (2010), for instance, examined the impact of CSs training on 62 Japanese EFL female students' speaking test performance and concluded that the negotiation for meaning, social-affective, and response for maintenance strategies were strong predictors of the learners' oral test performance. Similarly, in the Iranian educational context, Maleki (2007) explored the cause/effect relationships between CSs instruction and speaking performance and reported the efficacy of the use of CSs on speaking test performance. Adopting a rather more inclusive perspective than just considering CSs, Swain et al. (2009) studied the strategic behaviors employed by 30 test takers taking the speaking section of the TOEFL, the extent to which the strategic behaviors varied across different types of tasks (independent

and integrated), and the associations between using the adopted strategies and oral test performances. They found that (a) the most frequently adopted strategies comprised cognitive, metacognitive, and CSs, (b) undergraduate students employed more CSs, whereas the graduate students employed more cognitive strategies, (c) approach and metacognitive strategies were used almost to the same extent across the two groups, and (d) use of cognitive and communication strategies and test scores were positively related; the associations between affective and metacognitive strategies and test scores were negative.

Huang and Hung (2018) studied 177 Taiwanese EFL learners' strategic behaviors elicited from the integrated tasks and their relationships with test performance through the conduct of two-step structural equation modeling. The results revealed that integrated speaking tasks elicited discourse synthesis strategy use, cognitive strategy use, and communication strategy. Standing in stark contrast with the findings of the previous studies and theoretical backgrounds of the field, however, CSs negatively impacted the integrated speaking performance. The authors attributed the discrepancy to the test takers' insufficient resources.

2.3. Speaking Skill

The development of a relative mastery over speaking skill and the ability of language learners to successfully deal with the demands of oral communication in various situations is perceived as the main index of knowing a language by all accounts (Celce-Murcia, 2001; Scrivener 2011). At the same time, given the large number of foreign or second language resources the learners are required to master (e.g., semantic, syntactic, and pragmatic knowledge) to engage in successful oral interaction, many scholars (e.g., Brown, 2001; Field, 2011; Tarone, 2005; Thornbury, 2012) view the speaking skill as the most demanding ability to master especially in a foreign language environment (Ortega, 2007).

Similar to Ortega's (2007) perspective in this regard, Shumin (2002) believes that developing speaking skill for the people who have the least amount of exposure to the target language and culture turns into a highly challenging task since exposure is a prerequisite to understanding sociolinguistic and paralinguistic traits, and cultural assumptions. Additionally, for the EFL learners who are developing their interlanguage, the complexities involved in mastering the speaking ability are exacerbated as they are supposed to conceptualize requisite concepts (Field, 2011), formulate lexical, grammatical, and phonological features of their speech (Bygate, 2002), articulate their message (Kormos, 2006), and monitor all of the aforesaid stages instantly (Thornbury, 2012). More importantly, as pointed out by Carter and Nunan (2001), what adds to that difficulty is the fact that the mentioned main stages of processing speaking should be applied automatically and under the pressure of transient time.

Concerning the pressure induced due to the transient time in oral interactions, scholars have indicated (e.g., Brown, 2007; Lazaraton, 2001) that perhaps the most formidable aspects of mastering the speaking ability for the EFL learners are the demands of real-time interaction including being able to comprehend the interlocutors' utterances (Luoma, 2004) and maintaining the flow of conversations (Derwing, 2017).

Against such a background, it is quite logical to expect that such an intricate and complex process is affected by a wide variety of affective and cognitive factors the study of which has always been a major preoccupation of second and/or foreign language teaching experts and researchers. However, it is noteworthy that the bulk of such studies are primarily carried out in traditional or so-called real educational contexts and the study of the interplay of different affective and cognitive factors and the speaking ability of the language learners in virtual and/or online educational contexts is a much more recent and ignored undertaking. As a few instances of such studies carried out in regular contexts, El-Sakka (2016), for example, found a significant positive association between self-regulation and enhanced speaking performance of language learners. On the other hand, focusing on the impacts of anxiety on speaking test performance, Huang (2018) explored the structural model of interrelations amongst four types of anxiety (i.e., state, trait, test, and language anxiety) and Taiwanese EFL learners' speaking test performance and confirmed the negative impact of test anxiety on speaking test performance through the mediation of language anxiety.

2.4. Test Anxiety

Language learning anxiety is a multidimensional construct (Horwitz, 2010) and has been described as a complex of emotional and cognitive distress accompanied "with an arousal of the autonomic nervous system" (Spielberger, 1983, p. 1). It is widely accepted to encompass three interrelated researchable components of communication apprehension, fear of negative social evaluation, and test anxiety (Brown, 2014). To Horwitz et al. (1986), communication apprehension is a communication-hindering state stemming from second/foreign language learners' inability to convey their thoughts and views appropriately. Fear of negative social evaluation arises from an individual's enthusiasm to create a positive impression on other society members (Brown, 2014). Finally, test anxiety refers to language learners' disposition to react physiologically and behaviorally to their concerns about tests results (Zeidner, 2007).

Test anxiety is believed to be of trait, state, situation-specific, debilitating, and euphoric types, and two main components of worry and emotionality in the literature. Trait test anxiety is identified as language learners' predisposition to experience anxiety permanently, whereas state test anxiety is experiencing anxiety temporarily (Gregersen et al., 2014). Test anxiety is also described as a situation-specific trait language learners experience in situations specifically pertinent to evaluative incidents (Bonaccio et al., 2012; Jiang & Papi, 2021; Stober, 2004; Zeidner, 2007). Euphoric or facilitating anxiety finally refers to low and moderate levels of anxiety (Brown, 2014; Horwitz, 2010; MacIntyre & Gardner, 1989) which is verified to be an aid to language achievement (Hewitt & Stephenson, 2012; Teimouri, 2017). Debilitating test anxiety, on the other hand, refers to high levels of test anxiety that are confirmed to hinder performance (MacIntyre & Gregersen, 2012; Schnell et al., 2015; Teimouri et al., 2019; Zhang, 2019).

Concerning the two components of test anxiety, i.e., worry and emotionality, worry has been described as a learner's concerns and cognitive reactions to being in evaluative situations, and involves thoughts such as being compared to others and being the cause of parents' sadness (Bonaccio & Reeve, 2010; Cassady & Johnson, 2002; Stober, 2004). Emotionality, on the other hand, refers to the individuals' perceptions of physiological reactions such as perspiration, palpitations, and dizziness evoked by evaluative situations.

Studies have explored the impact of anxiety on different aspects of learning achievement in online contexts. As a notable example, Heckel and Ringeisen (2019) presented the structural model of the relations among anxiety, pride, self-efficacy, appraisal, and students' online learning achievement. The resulting model revealed the impact of anxiety on self-efficacy and learning outcomes. Hurd (2007), as another instance, studied nature-related aspects of language anxiety in an online mode of learning. She found that test anxiety was perceived as a negative factor affecting speaking performance as the most anxiety-provoking aspect of online language learning. Wang and Zhan (2020) also explored the relationships between learner beliefs, foreign language learning anxiety, motivation, and online self-regulated learning and confirmed the influence of learner beliefs and foreign language anxiety on online learners' use of self-regulatory strategies, meanwhile, the mediating role of motivation was confirmed as well. Ahmadi Safa and Majidi Kia (2023), As the final study reviewed here, adopted a path analytic research design to investigate the interrelationships among test anxiety, metacognitive awareness, test-wiseness, and Iranian EFL learners' test performance. The results depicted a strong relationship between test wiseness and test performance. In addition, test wiseness was the mediator between test performance and metacognitive awareness of learning strategies. Further the inverse relationship between test anxiety and learning strategies metacognitive awareness was verified.

As is evident in the brief literature reviewed above, the number of studies focusing on the causal or correlational relationships among individual variables and speaking test performance in traditional classroom-based contexts is out of proportion to the studies carried out in online learning environments. Moreover, considering the path analytic association of the aforesaid variables, the number of studies shrinks even more considerably. Hence, on the basis of the reviewed literature and taking into account the significance of the studied variables and the scarcity of the confirmed models depicting the path analytic relations among online self-regulated learning, use of CSs, test anxiety, and online speaking test performance, the researchers in the present study raised the following research questions, assumed a model of hypothetical interrelations among the variables (Figure 1) and took the necessary steps to test the validity of the hypothesized model.

Research Questions and The Hypothesized Model

1. Is there any significant relationship between EFL learners' online self-regulated learning and the use of CSs?

2. Is there any significant relationship between EFL learners' online self-regulated learning and speaking test performance?

3. Is there any significant relationship between EFL learners' use of CSs and speaking test performance?

4. Is there any significant relationship between EFL learners' online self-regulated learning and test anxiety?

5. Is there any significant relationship between EFL learners' use of CSs and test anxiety?

6. Is there any significant relationship between EFL learners' test anxiety and speaking test performance?

7. Among EFL learners' online self-regulated learning, test anxiety, and use of CSs which one is the strongest predictor of their speaking test performance?

The above-mentioned research questions were hypothetically responded to on the basis of the reviewed literature, and a hypothetical model of structural relations was assumed (Figure 1.)

Figure 1
The Hypothesized Model
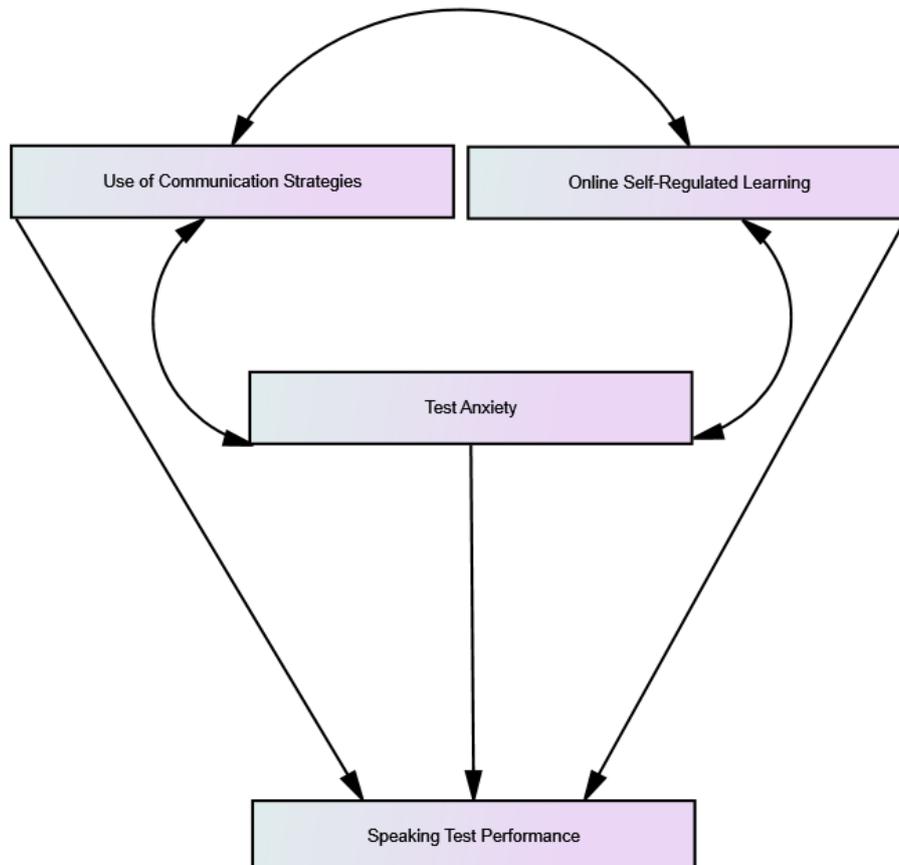
3. Method

Give adequate information to allow the experiment to be reproduced. This section will include sub-sections.

3.1. *Participants and Setting*

The participants who expressed their consent to take part in the study were 132 EFL learners (26% male and 74% female) who were selected through a convenience nonrandom sampling procedure due to the impracticality of a true random selection of the participants in the study context. They were recruited as English learners in the private English institutions of Kermanshah, a western province of Iran, which held online language courses during the COVID-19 pandemic. Concerning general English proficiency level, 70 participants were found to be at intermediate, and 62 at pre-intermediate levels of general English proficiency. The mean age range of the participants was 15 (SD=2).

3.2. *Instrumentation*

The measures and scales applied to collect the required data are described below in order. Additionally, a brief description of the structure and psychometric features of the measures are provided as well.

3.2.1. Oxford Quick Placement Test. A sample paper and pencil Oxford Quick Placement Test (OQPT) was administered to guide the selection of pre-intermediate and intermediate-level participants (Oxford University Press [OUP], 2001). OQPT is a standardized English proficiency test in two paper and pencil and computer-based versions. The 60-item paper and pencil version was applied for the present study purpose. According to the test rubrics, participants whose scores fell between 18 to 29 were considered to be at pre-intermediate level of proficiency and those whose scores were between 30 to 39 were considered intermediate-level learners.

3.2.2. A2 Key. The speaking part of a sample A2 Key was administered to test the pre-intermediate participants' speaking skill. A2 Key is a test of three parts: reading and writing, listening, and speaking. The speaking part of this test which was used to assess the speaking proficiency of participants of this study includes two parts and lasts for about 8 to 10 minutes per each pair of candidates. In the first part, the examinees are required to answer some personal information questions, and in the second part, the candidates are shown some cards to talk about with their counterparts. Concerning the validity of use and the reliability of the test scores, studies (e.g., Soodmand Afshar, 2020; Taylor, 2011; West & Frumina, 2012) have confirmed the A2 Key test as a reliable and valid instrument for assessing English proficiency in different contexts.

3.2.3. B1 Preliminary. The speaking part of a sample B1 Preliminary was administered to test the speaking skill of the intermediate participants. Similar to A2 Key, B1 Preliminary comprises three parts: reading and writing, listening, and speaking. The speaking part of the test which lasts for about 10 to 12 minutes for each pair of candidates consists of four sections. The validity and reliability of the B1 Preliminary has also been confirmed by Taylor (2011) and studies have widely applied and confirmed the psychometric merits of the test (e.g., Ahmadi Safa & Afzalimir, 2021).

3.2.4. Online Self-regulated Learning Questionnaire. Online Self-regulated Learning Questionnaire (OSLQ) developed by Barnard et al. (2009) was administered to assess the participants' online self-regulated learning. The questionnaire includes 24 five-point Likert-scale items grouped in six subscales of goal setting, environment structuring, task strategies, time management, help seeking, and self-evaluation. Barnard et al. (2009) confirmed the validity of the measure and reported the reliability estimates of its factors to range from 0.87 to 0.96. In order to make sure of the validity of the questionnaire in the context of the present study, Confirmatory Factor Analysis (CFA) was conducted on the obtained data which resulted in the revalidation of the scale in the new context. The CFA results are presented in the following preliminary analyses part in detail. The reliability of the questionnaire was also re-estimated which resulted in an acceptable level of Cronbach's alpha ($\alpha = 0.96$) hence the scale was considered as a reliable measure of online self-regulated learning in the context of study.

3.2.5. Oral Communication Strategy Inventory. The speaking part of Oral Communication Strategy Inventory (OCSI) developed by Nakatani (2006) was applied to assess the participants' use of CSs. The questionnaire taps into the use of speaking and listening strategies. The speaking strategies are classified into eight main types of social affective, fluency-oriented, negotiation for meaning, accuracy-oriented, message reduction and alteration, nonverbal strategies, message abandonment, and attempt to think in English. This part contains 32 five-point Likert-scale items. The reliability of the speaking strategies part was reported to be 0.86 in Nakatani (2006). The validity of the questionnaire was rechecked (described in detail in the preliminary analyses part below) and confirmed in the context of this study. The reliability of the inventory was re-estimated and confirmed as well (α=.92).

3.2.6. Test Anxiety Scale. Test Anxiety Scale (TAS) developed by Sarason (1975) was administered to assess the participants' level of test anxiety. The original version of TAS, developed based on the theory and evidence that test anxiety is composed of test-relevant and irrelevant thinking, consisted of 37 two-point scale items; however, In'nami (2006) in order to ensure the normality of data distribution, to increase the accuracy of answers, and to make the response format of this scale consistent with that of the other scales of his study first reformatted it into a five-point Likert scale, then verified the normality of the distributions of the items, and finally conducted exploratory factor analysis followed by confirmatory factor analysis to confirm the validity of the scale. In'nami (2006) reported the reliability of the new questionnaire scores to be α= 0.85. In order to verify the validity of the questionnaire in the Iranian online context, a CFA was conducted, the results of which are presented in the preliminary analyses part below. The reliability of the scale was also re-estimated (α = 0.96) and confirmed to be highly reliable.

3.3. Procedures

The data collection procedure of this study lasted from September to December 2021. Initially, the verbal informed consent of 198 so-called pre-intermediate and intermediate EFL learners selected based on a convenience nonrandom sampling procedure was obtained. They were assured that their performances on the tests and scales would remain confidential and be used for the study purposes only. Next, to assess the participants' English proficiency level, a sample e-OQPT was administered to them via Whats App, the completion of which lasted for approximately 30 minutes. Out of 198, 147 EFL learners including 69 pre-intermediate and 78 intermediate EFL learners whose actual English proficiency level was verified to be as expected on the basis of e-OQPT scoring rubrics were identified to be given the measures of the study.

The identified pre-intermediate and intermediate EFL learners were given the tests (i.e., A2 Key and B1 Preliminary respectively) via WhatsApp, and their audio-recorded speaking performances were rated by the researchers following the rating rubrics of the tests. Afterward, the translated version of the questionnaires (i.e., OSLQ, OCSI, and TAS) were administered to the identified participants via WhatsApp. Concerning the translation process of the scales, it is noteworthy that the adopted questionnaires were translated into Farsi, back translated, and double-checked in order to verify the accuracy of the translation. It needs to be stated that the researchers chose to apply the translated version of the scales to make sure that the pre-intermediate participants' responses to the scales were not affected by the probable item comprehension problems and difficulties. In addition, given that the applied measures for the study groups needed to be identical, the translated versions of the scales were administered to the intermediate group of participants as well. To address the probable impact of the translation process on the validity and reliability of the scales, confirmatory factor analyses were run on the obtained data and Cronbach's alpha measure of internal consistency was applied to re-estimate the reliability of the translated scales. Finally, to make sure of the validity of the responses and safeguard the quality of the obtained data, initial data screening was carried out which resulted in the omission of 15 carelessly completed questionnaires. The final set of data was fed into the AMOS statistical package to test the hypothesized model of the relations among study variables.

3.4. Design of the Study

This study adopted a survey-type path analytic correlational design and examined a hypothetical model of interrelations among Iranian EFL Learners' online self-regulated learning, use of communication strategies, test anxiety, and online speaking test performances. The study variables were

measured through either educational or psychologically valid tests and the obtained data were subjected to descriptive and inferential statistical analyses. In order to test the validity of the assumed model of relations, the AMOS 24 statistical package was applied.

4. Results
4.1. Preliminary Results
Before conducting the main statistical analyses addressing the posed research questions and hypotheses, preliminary analyses including the reliability estimation of the instruments using Cronbach's alpha, conducting Confirmatory Factor Analysis (CFA) to verify the validity of the scales, rechecking the reliability of the scales after modifications, conducting inter-rater reliability ($\rho = .956$, n = 132, p < .05), and checking the normality of the data distribution through One-Sample Kolmogorov-Smirnov Test were carried out on the obtained data. The obtained reliability coefficient estimates of the scales conducted before and after running CFA on instruments are displayed in Table 1.

Table 1
Results of Cronbach's Alpha Measure of Internal Consistency

Scale	Number of items before/after modification	Cronbach's alpha before/after modification
Test Anxiety Scale	37/28	.94/.96
Online Self-regulated Learning Questionnaire	24/24	.96/.96
Oral Communication Strategy Inventory	32/30	.91/.92

As displayed in Table 1, all scales were found to enjoy satisfactory reliability levels before and after modifications. In order to verify the validity of the adopted scales, CFA was conducted on the obtained data. The resulting values for the fit indices of the measurement models (X2/df, GFI, IFI, TLI, CFI, NFI, and RMSEA) are presented in Table 2.

Table 2
Goodness of Fit Indices of Measures before Modification

	X2/df	GFI	IFI	TLI	CFI	NFI	RMSEA
Acceptable fit	<3	>.90	>.90	>.90	>.90	>.90	<.08
Model fit for TAS	2.079	.619	.759	.742	.756	.621	.091
Model fit for OSLQ	2.102	.742	.912	.896	.911	.844	.092
Model fit for OCSI	1.618	.756	.925	.914	.924	.825	.069

As displayed in Table 2, most of the fit indices for TAS (i.e., GFI<.90, IFI<.90, TLI<.90, CFI<.90, NFI<.90, and RMSEA>.08), did not lie within the acceptable fit thresholds. Therefore, the model was found in need of modification. To modify the model, items with factor loadings lower than 0.40 (items 3, 15, 20, 26, 27, 29, 33, 34, and 35) were removed (Comrey & Lee, 1992).

As for the OSLQ, some of the fit indices (i.e., GFI<.90, TLI<.90, NFI<.90, and RMSEA>.08) did not lie within the acceptable fit thresholds but were rather minimally at the borderline level. On this basis, the covariance among errors was needed to be checked for this scale (Comrey & Lee, 1992). But with regard to the OCSI, for which some of the fit indices (i.e., GFI=.756<.90, and NFI=.825<.90), did not lie within the acceptable fit thresholds too, similar to TAS, items with loading level below .40 were removed (i.e. items 3 and 31). Thereafter, the goodness of fit indices was reexamined, the results of which are displayed in Table 3.

Table 3
Goodness of Fit Indices of Measures after Modification

	X2/df	GFI	IFI	TLI	CFI	NFI	RMSEA
Acceptable fit	<3	>.90	>.90	>.90	>.90	>.90	<.08
Model fit for TAS	1.098	.858	.988	.984	.988	.881	.027
Model fit for OSLQ	1.405	.847	.970	.962	.970	.904	.056
Model fit for OCSI	1.116	.852	.989	.956	.988	.901	.030

As shown in Table 3, almost all of the fit indices lied within the acceptable fit thresholds after modifications. Afterwards, to confirm the normality of data distribution, the Kolmogorov-Smirnov Test was conducted, the results of which are displayed in Table 4.

Table 4
Results of One-sample Kolmogorov-Smirnov Test

	One-sample Kolmogorov-Smirnov test			
	Speaking test performance	Online self-regulated learning	Test anxiety	Use of CSs
N	132	132	132	132
Normal parameters[a,b]				
Mean	17.861	76.712	84.325	98.854
Std. Deviation	3.110	25.857	27.605	20.402
Kolmogorov-Smirnov Z	.706	.847	.879	.836
Asymp. Sig. (2-tailed	.701	.480	.423	.487

[a] Test distribution is normal, [b] Calculated from data

As indicated in Table 4, the Sig. values for the scores of the variables of the study, i.e., online speaking performance (0.701), online self-regulated learning (0.480), test anxiety (0.423), and use of CSs (0.487) were above the critical value (0.05). Therefore, the normality of distribution for the scores of the aforementioned variables was confirmed. Lastly, to evaluate the strength of the association among the studied variables, Pearson Correlation analysis was adopted, the results of which are presented in Table 5.

Table 5
The Relationship among the Variables of the Study

	1	2	3	4
1. Test anxiety	1			
2. Online self-regulated learning	-.738**	1		
3. Use of CSs	-.545**	.663**	1	
4. Online speaking test performance	-.497**	.633**	.564**	1

As displayed in Table 5, EFL learners' online self-regulated learning associated positively with online speaking test performance (r=.63, p<.05), use of CSs associated positively with online speaking test performance (r=.56, p<.05), and test anxiety associated negatively with online speaking test performance (r=-.49, p<.05). Moreover, the results showed that online self-regulated learning and use of CSs were positively correlated (r=.66, p<.05), online self-regulated learning and test anxiety were in inverse association (r=-.73, p<.05), and use of CSs and test anxiety were also in inverse association (r=-.54, p, p<.05).

4.2. Confirmatory Analyses

Structural equation modeling (SEM) procedures were employed to examine the validity of the hypothesis model shown in Figure 1 and to examine the structural relations AMOS statistical package was used. A number of fit indices including the Chi-square magnitude, degree of freedom ratio, Normed Fit Index (NFI), Good Fit Index (GFI), Comparative Fit Index (CFI), and the Root Mean Square Error of Approximation (RMSEA) were examined, the results of which are shown in Table 6.

Table 6
Goodness of Fit Indices of the Hypothesized Model

|	X^2/df	NFI	GFI	CFI	RMSEA
Acceptable fit	<3	>.90	>.90	>.90	<.08
Model fit	42.723	1.00	1.000	1.000	.564

As it is evident in Table 6, some of the fit indices (i.e., chi-square/df ratio=42.72 and RMSEA=0.564), did not lie within the acceptable fit thresholds. Therefore, the model was in need of modification. In order to modify the model, the non-significant direct path from test anxiety (β= -0.03, p>.05) was removed. Afterward, some of the fit indices were reexamined, the results of which are presented in Table 7.

Table 7
Goodness of Fit Indices of the *Modified Valid Model*

	X2/df	NFI	GFI	CFI	RMSEA
Acceptable fit	<3	>.90	>.90	>.90	<.08
Model fit	.160	.999	.999	1.000	.000

As shown in Table 7, all the fit indices (i.e., chi-square/df ratio=.160, RMSEA =.000), NFI =.999, GFI =.999, and CFI=1.000) lied within the acceptable fit thresholds. Hence, it was concluded that the model had a perfect fit with the empirical data after modification. Figure 2 shows the resulting final model of interrelationships among online self-regulated learning, use of CSs, test anxiety, and online speaking test performance.

Figure 2
The Verified Final Model
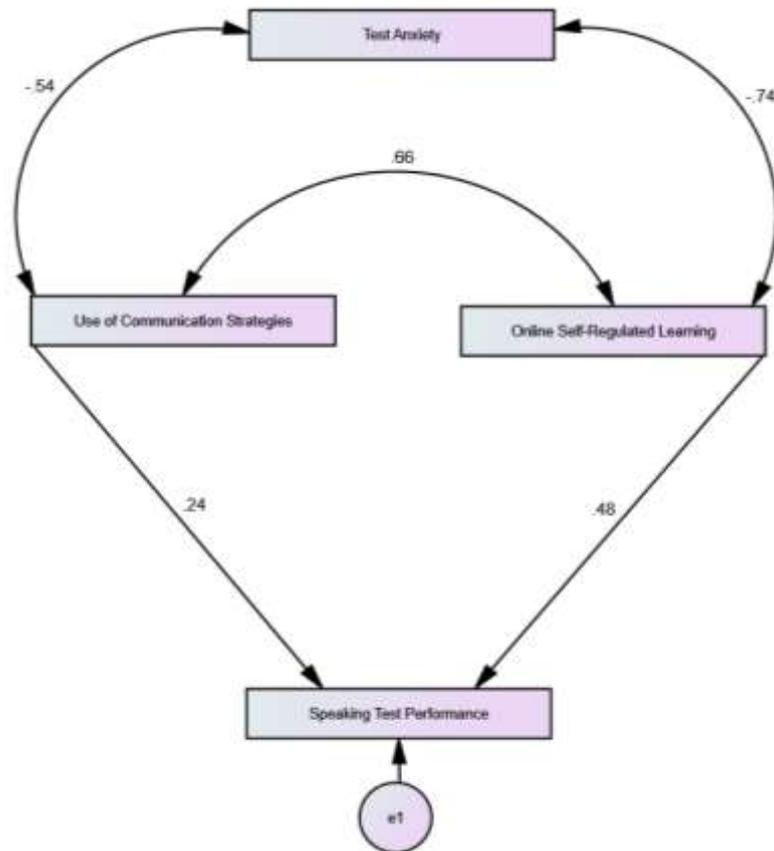
Concerning the last research question which sought the strongest predictor of online EFL learners' speaking test performance, multiple regression analysis was conducted on the obtained data, the results of which are presented in Tables 8 and 9.

Table 8
Multiple Regression Results: ANOVA Analysis

		Sum of Squares	df	Mean Square	F	Sig.
	Regression	531.520	3	177.173	26.466	.000^b
1	Residual	856.871	128	6.694		
	Total	1388.392	131			

a. Dependent Variable: Speaking Test Performance
b. Predictors: (Constant), Test Anxiety (modified), Use of Communication Strategies (modified), Online Self-Regulated Learning (modified)

TTable 9
RRegression Output: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	7.239	2.141		3.382	.001
	Online Self-Regulated Learning	.000	.024	-.001	-.014	.989
	Use of Communication Strategies	.097	.011	.610	8.586	.000
	Test Anxiety	-.012	.015	-.057	-.788	.432

a. *Note*: Dependent Variable: Speaking Test Performance

As shown in Table 9 and Figure 2 both online self-regulated learning (Beta=0.440 and t=3.973) and use of communication strategies (Beta=0.255 and t=2.860) were significant predictors of EFL learners' speaking test performance. However, it was found that test anxiety (Beta=-.034 and t=-.341) did not predict Iranian pre-intermediate and intermediate EFL learners' speaking test performance. Consequently, based on the results, it can be concluded that online self-regulated learning was the most prominent predictor of online speaking test performance. Furthermore, the model displays a positive association between online self-regulated learning and the use of CSs (β= 0.66, p<.05), however, test anxiety was in inverse association with both online self-regulated learning (β= -0.74, *p*<.05), and use of CSs (β= -0.54, *p*>.05).

5. Discussion

Drawing upon Bachman and Palmer's (1996) interactional framework of language use, this study set out to present and test a model of interactions among EFL learners' online speaking test performance and online self-regulated learning, test anxiety, and use of CSs. On the basis of the final verified model the relation between online self-regulated learning and online speaking test performance was confirmed to be a strong association. Partially consistent with this finding, Broadbent and Poon (2015) concluded that online self-regulated learning and academic achievement had close ties. Similarly, having explored whether online self-regulated learning would predict online learning achievement, Eom (2019) proved the association as a strong one, and so did Chiu et al., (2023). The results in this regard might be due to the online EFL learners' proactive use of strategies such as goal setting, allocating more time to study, and self-assessing predetermined goals, since as Zimmerman (2013) contended, high achievers might probably adopt more self-regulatory strategies to attain their learning goals compared with their low achiever counterparts.

With regard to the path from use of CSs to online speaking test performance, the analyses also proved the relationship as a strong one. Having explored the same association in traditional in-person learning contexts, Swain et al. (2009), Nakatani (2010) and Barkaoui et al. (2013) came to a similar conclusion and confirmed that EFL learners' use of CSs positively affected their speaking performance. It seems to be rather controversial, however, to report that in Huang and Hung (2018), due to the test takers' insufficient resources, use of CSs negatively affected speaking test performance. This piece of results of the current study might be justified regarding the attested importance of the use of effective CSs such as accuracy-oriented, fluency-oriented, and social-affective ones confirmed to improve speaking skill (Nakatani, 2006).

Regarding the assumed path from test anxiety to online speaking test performance, the results of the correlational analyses indicated that these two variables were in inverse association; the results of path analytic interrelations among the variables in the valid model, however, rejected the direct path. Concerning the verified strong association between test anxiety and speaking test performance, the results of this study partially resembled those of Ramirez-Arellano et al. (2018), which showed the impact of test anxiety on learning achievement and also those of Shores and Shannon (2010). Standing in stark contrast with such results, In'nami's (2006) showed that due to the test takers' possible high levels of self-esteem, test anxiety and listening test performance were not associated. The indirect path

from test anxiety to online speaking test performance mediated through the use of CSs and online self-regulated learning in our model might be attributable to the fact that anxiety hinders test performance through its debilitating impact on test takers' focus and tendency to maintain the flow of conversation, since as also pointed out by MacIntyre and Gregerson (2012), anxiety interferes with cognitive processes.

Analyses also revealed that test anxiety and online self-regulated learning were in inverse association. This might be ascribable to the hindering impact of test anxiety on the metacognitive process, as is also pointed out in Zimmerman (1989), since those processes have been figured out to affect self-regulatory strategies such as goal setting and self-evaluating. Test anxiety, indeed, was displayed as a negative predictor of online self-regulated learning. Partially in accordance with this piece of finding in this regard, Wang and Zhan (2020) confirmed learning anxiety as a negative predictor of online self-regulated learning, so did Gua et al. (2018) and Shih (2019). Similarly, Dorrenbacher and Perels (2016) showed that test anxiety and self-regulated learning were inversely correlated.

Additionally, test anxiety was found to be a negative predictor of EFL online learners' use of CSs in the verified final model. Similarly, Liu and Zhang (2013) verified that test anxiety and use of CSs were inversely correlated in traditional classroom contexts. Investigating the potential association between language learning anxiety and language learning achievement in an Iranian context, Golchi (2012) came up with the same results. It probably means that test anxiety through its negative effect on cognitive processes impedes EFL online learners' use of CSs; use of CSs such as social-affective strategies, on the other hand, might help reduce test anxiety of online EFL learners, since as pointed out by O'malley and Chamot (1990), the aforesaid strategies help EFL learners control anxiety through encouraging themselves, taking risks, and enjoying communication with their peers and/or interlocutors.

Concerning the path from online self-regulated learning to the use of CSs, the analyses showed a strong association between these variables as well. This finding supports the results of Erdogan (2018); furthermore, the findings partially resemble those of Sasaki et al. (2018), which indicated that the development of the use of writing strategies was due to self-regulation. It seems that the more self-regulated the online EFL learners are, the more proactive they are in setting goals and thriving to reach those goals by adopting effective CSs, the point that was also echoed by Pintrich (2000).

6. Conclusion

The study explored the model of intricate interactions among Iranian pre-intermediate and intermediate EFL test takers' features (i.e., self-regulation, use of CSs, and test anxiety) and speaking test performance in an online context. A close look at the overall verified pattern of relations among the studied variables in the final model revealed that online speaking test performance was directly affected by online learners' use of self-regulatory (the strongest predictor) and communication strategies. Test anxiety, however, affected online speaking test performance through its debilitating impact on online learners' self-regulated learning and use of CSs. Furthermore, the verified model depicted a positive association between online self-regulated learning and the use of CSs and a negative association between test anxiety and self-regulatory and communication strategies.

Theoretically, the attested model might lend support to (a) Bachman and Palmer's (1996) language use framework illustrating test performance as a vulnerable construct affected by test takers' attributes and features of the test tasks, (b) Oxford's (2017) definition of language learning strategies governed by self-regulation, and (c) the impact of construct-irrelevant factors (test takers' personal characteristics) on test performance.

The results might also have some pedagogical implications. With regard to the strong interrelations between the studied variables, it seems necessary, as also echoed by some scholars (Oxford, 2017; MacIntyre & Gregersen, 2012), for language teachers to leave some room for teaching online self-regulatory strategies while teaching CSs in their schedule and dealing with their students' affective states such as anxiety. Further, EFL teachers are recommended to introduce artificial intelligence (AI) to their students in the digital wilds. AI chatbots such as Duolingo which sends daily notifications to its EFL users' helps them to become more self-regulated. Moreover, such chatbots can play the role of a speaking partner to the EFL learners anytime, anywhere they need one which may in turn decrease their speaking anxiety.

Our results might also have some implications for EFL learners learning English in traditional and online learning contexts. Regarding the interactions among the studied variables, it seems beneficial for EFL learners to practice self-regulation, anxiety management techniques, and CSs which can be facilitated through the use of technology beyond the classroom. Furthermore, as is pointed out by many scholars (Maleki, 2007, for instance), incorporating CSs into the EFL syllabi seems to be of paramount importance, and so is incorporating online self-regulatory strategies.

Finally, as for the limitations of this study, it needs to be made clear that focusing on pre-intermediate and intermediate EFL learners in private language institutions excluding other proficiency levels and the public sector are among the limitations of this study. Furthermore, the inevitable convenience sampling method which was adopted due to the impracticality of random selection might limit the generalizability of the findings. Lastly, since the participants completed the speaking tests remotely from their homes, uniform administration conditions were not guaranteed for them.

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