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Research Article

Changes in and Effects of Anxiety on English Test Performance in Chinese Postgraduate EFL Classrooms

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As an important affective factor in language learning, foreign language anxiety (FLA) has been extensively researched. Nevertheless, not many studies have targeted postgraduate students or been longitudinal to reveal the dynamic nature of FLA. Hence, the present quantitative study examined changes in and effects of FLA on postgraduate students' performance over a 10-week period. A total of 324 postgraduate students from a prestigious university took a pretest and posttest, answered a set of questionnaires before (phase 1) and after (phase 2) the 10-week period, respectively. Analyses of the data revealed three major findings: (1) Toward the end of the period, the respondents became significantly less apprehensive of speech communication in English and less worried about the English class, English classroom performance, and other students' performance. Their overall English language classroom anxiety was significantly lower as well, though they became significantly more worried about tests. (2) In both phases, anxiety was largely highly related to students' performance in English speaking, listening, reading, and writing tests as well as the overall test performance, especially speaking test performance. Nevertheless, this correlation became weaker in phase 2. (3) In both phases, foreign language classroom anxiety and achievement anxiety powerfully predicted students' English test performance, especially speaking test performance. These results show that FLA is an important issue even for postgraduate students, affecting their test performance to varying degrees over time. Based on these findings, implications and suggestions are discussed.

1. Introduction

Since early 1970s, foreign language anxiety (FLA) has become a hot topic of research and proved to be an important affective factor influencing second/foreign language (SL/FL) learning outcomes. A multitude of empirical research on FLA in relation to learning of various skills of a SL/FL has revealed a consistently negative association between anxiety and language learning outcomes, especially between anxiety and SL/FL speaking performance [1–10]. Even so, most quantitative studies rely on correlation analyses to explore the relationship between FLA and language learning outcomes, which reveals little cause and effect relationship between the two. Though a few studies have employed regression analyses to reveal the effects of anxiety on students' performance in a SL/FL [9, 11], more such studies are needed to further verify the effects of FLA on language learning outcomes [12, 13].

In addition, the current literature shows that FLA is dynamic as it interacts with other variables such as motivation, self-confidence, and learning experiences [14–20]. Nevertheless, one-time research still prevails in the current literature [13, 21, 22], meaning that most studies approach FLA at a frozen moment while ignoring the changing nature of FLA. Consequently, longitudinal studies on FLA, especially those with large samples, are urgently needed [22].

Moreover, as discussed in [23], most current studies target college students, with only a few targeting postgraduate or middle school or younger learners, which also

deserve research considering the diversity of learner populations and complexity of individual characteristics.

For these reasons, the present quantitative research, targeting Chinese first-year postgraduate EFL (English as a FL) learners, sought to collect data with a large sample over a 10-week period to better reveal changes in anxiety and its relationship with students' English learning outcomes.

2. Literature Review

Research on language anxiety has evolved from a general psychological construct to language-related anxiety, to foreign language anxiety (FLA), and then to specific situational types of anxiety related to various skills of a SL/FL. The earlier definition of anxiety covered two dimensions: the debilitating function or "unpleasant emotional state" [24, p. 482] and the potential causal or consequential effects, which were "indirectly associated with an object" [25, p. 18]. Later, FLA tends to be conceptualized as learners' negative responses, including learners' self-beliefs, emotional awareness, and their associated actions in coping with SL/FL learning [26, 27].

A major line of FLA research focuses on relationships between anxiety and SL/FL learning outcomes. When exploring such associations, researchers tend to employ language achievement/performance tests, final course grades, and ratings of students' proficiency in the target language [1, 6, 9, 23, 28–30]. Adopting scales such as Spielberger's State-Trait Anxiety Scale [24] and Gardner's French Class Anxiety scale [31], earlier studies yielded mixed and sometimes even contradictory results about the relationship between FLA and language learning outcomes [32–34]. This inconsistency in findings was attributed to the "absence of a well-built construct" [35, p. 639] and to the treatment of anxiety as one of the affective learner variables in a general sense [33]. Consequently, researchers began to focus more on specific situational type of anxiety related to SL/FL learning [27, 28, 30]. For example, [27] narrowed down the study of anxiety to the foreign language classroom context and developed a 33-item Foreign Language Classroom Anxiety Scale, which has been widely used in empirical studies thereafter [1, 6, 9, 11, 28, 29, 36, 37]. And a variety of specific language skill-related scales have also been developed to measure SL/FL listening, speaking, reading, and writing anxieties, [5, 7, 8, 10, 30, 38, 39]. These studies, as well as subsequent research [2–4, 28, 40–43], have generally revealed a consistently negative association between anxiety and SL/FL learning outcomes, especially between anxiety and SL/FL speaking performance. Even so, since this negative relation is largely dependent on correlation analyses in most studies, little cause and effect relationship can be inferred from this relationship. Despite the attempts to reveal the effects of anxiety on students' performance in a SL/FL via regression analyses in a few studies [9, 11], more research of this stream is expected to further validate the assumption that FLA is more debilitating than facilitating [12, 13].

As the endeavor of FLA study advances, researchers realize that anxiety is dynamic [14–16, 18–20, 44]. This epistemological view takes language anxiety as an ongoing and nonstatic construct, which echoes the essential properties of a dynamic system featuring the variations of the learning process and interrelations among various subsystems [45]. Varying degrees of anxiety are likely to occur during the learning process due to a variety of reasons, including the interactive effects of anxiety with other variables like motivation, interest and enjoyment, and increasing exposure to and use of the target language [3, 20, 22, 46]. Because of this, more researchers tend to adopt dynamic approaches to FLA, one of which in the current literature is embraced as idiodynamic on an individual base, advocating taking moment-to-moment snapshots of anxiety and then connecting the dots into an overall system to delineate the picture of vibrating trends [16, 18, 44]. Another dynamic approach mixes a variety of complex techniques, including latent growth curve modelling and longitudinal cluster analysis, to trace the changing status of anxiety and its relationship with other variables like motivation [22]. In spite of the efforts for alternative approaches, cross-sectional studies still dominate the current literature [21, 22, 32]. Hence, there is a call for longitudinal studies on FLA, especially those with large samples, to further explore the fluctuating nature of FLA and its effects on students' performance in the target language [22].

Moreover, as discussed in [23], most current studies target college students, only a few have examined foreign language anxiety in postgraduate, middle school, or younger students. Considering the diversity of learners and the complexity of individual characteristics, foreign language anxiety in various student populations is worth researching. Hence, the present quantitative research, targeting Chinese first-year postgraduate EFL learners, adopted a 10-week longitudinal pretests and posttests design with a large sample, aiming to better reveal the changes in anxiety and its relationship with students' English learning outcomes during the learning process. And the following two research questions were of particular interest:

(1) How does anxiety change over the 10-week period?

(2) What are the effects of anxiety on students' English test performance?

3. Research Design

3.1. Context. The present study was conducted in a prestigious research institute in Shenzhen, where an English language course was mandatory for all postgraduate students, aiming to enhance their listening, speaking, reading, and writing skills. The course adopted an integrated method of teaching, which included a variety of teaching and learning activities such as group discussion based on a video clip, individual presentation, and role play. Most postgraduate students were (highly) motivated to study English well since they were required to publish research articles in English to graduate in time.

3.2. Participants. Altogether, 324 (218 male and 106 female) first-year postgraduate students registered in the

abovementioned English language course participated in the present study, who were from ten natural intact classes which were grouped based on their English placement test results taken upon entering the institute. With an average age of 22.38 (SD = 2.01), the participants came from various disciplines such as Material Science, Industrial Engineering, Computer Science, Chemistry, and Biology.

3.3. Instruments. Data in the present study were collected via the background information questionnaire, English tests, the English Language Classroom Anxiety Scale, and the Achievement Anxiety Test, as detailed below.

3.3.1. Background Information Questionnaire. The background information questionnaire was designed to collect information such as name, gender, discipline, and age of the participants.

3.3.2. The English Test. Both pretests and posttests consisted of the following 4 parts: listening, reading, writing, and speaking, with 25 points for each part. The listening part included one 3-minute long conversation; the reading part had one passage of around 350 words; the writing test asked students to write a 200-word business email in 20 minutes, and the speaking test was conducted in the form of 3-minute debate/discussion on a given topic between 2 students. The listening and reading tests were standardized, multiple-choice measures, while the writing and speaking tests were marked holistically.

3.3.3. English Language Classroom Anxiety Scale. To suit the present study, the 36-item Foreign Language Classroom Anxiety Scale modified from the original scale developed by [27] and used in [47] was employed in the present study (Table 1). The scale was named English Language Classroom Anxiety Scale (ELCAS) to cover different aspects of English learning in class. Examples were "It frightens me when I don't understand what the teacher is saying in English" and "I get tense and nervous when I have to discuss things unfamiliar to me."

3.3.4. The Achievement Anxiety Test. This 19-item Achievement Anxiety Test (AAT) was adopted from that developed by [48] consisting of the 10-item facilitating anxiety scale (FAS), which measures the degree to which test anxiety improves student performance, and the 9-item debilitating anxiety scale (DAS), which measures the negative effect of test anxiety.

Placed on a 5-point Likert scale, each item of ELCAS and AAT scales had five alternatives, ranging from "*Strongly Disagree*" to "*Strongly Agree*" with values of 1–5 assigned to the descriptors, respectively. A higher ELCAS score, FAS score, and DAS score indicated higher facilitating anxiety, higher debilitating anxiety, and greater positive effect, respectively. The basic characteristics of the measures are presented in Table 2, which revealed fairly high reliability and good mean item-total correlation for each measure in either phase.

3.4. Procedure. The present quantitative study collected data over a 10-week period in a semester. At the beginning of the term, a form of consent was distributed to around 10 natural intact classes of first-year postgraduate students, inviting them to participate in the present study. In week 2 (phase 1), they took the pretest and answered the battery of questionnaires, from whom 347 sets of complete data were collected. Then in week 11 (phase 2), students of the same intact classes took the posttest and filled in the same battery of questionnaires, from whom 335 sets of complete data were collected. After that, incomplete questionnaires and questionnaires with no matching in either phase were deleted, which resulted in 324 sets of complete matching data in both phases for further analyses.

3.5. Data Analyses. Students' performance in the writing and speaking tests was scored by two instructors teaching the same course with a reliability of .91 and .923, respectively, with the mean being a student' final score in the writing or speaking test. Then all the data were analyzed via SPSS 20. The ELCAS was first subjected to rotated (varimax) principal factor analysis in both phases to determine its underlying components. Correlation analyses were run to examine the correlations between ELCAS and AAT scales. Then, paired sample t-tests were run in ELCAS and AAT scales to explore the changes in foreign language anxiety in two phases. After that, correlation and regression analyses were conducted to explore the relations between ELCAS and AAT scales and students' English test performance and the predicting effects of ELCAS and AAT scales on the latter.

4. Results

Prior to any statistical analysis, the adapted English Language Classroom Anxiety Scale (ELCAS) was subjected to rotated (varimax) principal components analysis in both phases, as performed in [27, 28]. The analysis yielded five factors in phase 1 and six factors in phase 2, with all eigenvalues exceeding 1 (see Table 3). Based on these results, coupled with a detailed examination of each ELCAS item and the findings of the reviewed literature, the present study adopted a 5-factor solution on the ELCAS. Then a confirmatory factor analysis was conducted on the ELCAS in both phases with this 5-factor solution (the results are reported in Table 1). The resultant 5 factors were 13-item ELCAS1 indicative of fear of speech communication in English, 11-item ELCAS2 suggestive of worry about the English class, 8-item ELCAS3 implicative of worry about one's own classroom performance, 2-item ELCAS4 indicating worry about peers' classroom performance, and 2-item ELCAS5 showing worry about tests in English. These 5 factors were then used in subsequent analyses in this paper. As shown in Table 4, the ELCAS factors were highly significantly correlated with each other ($r = 0.273 \sim 0.786$, $p \leq 0.001$) and the overall ELCAS

Table 1: Loadings of principal components of ELCAS (phases 1/2) ($N = 324$).

ELCAS items	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
11. I never feel quite sure of myself when I am speaking English in my class	**0.660/0.639**	0.006/−0.027	−0.275/−0.159	−0.226/0.201	−0.053/0.333
12. I do not worry about making mistakes in the English class	0.568/−0.482	−0.004/−0.045	**−0.394/0.475**	−0.050/0.148	0.189/0.201
13. I tremble when I know that I'm going to be called on in the English class	**0.712/0.681**	−0.239/0.201	−0.025/0.013	−0.112/−0.159	−0.214/0.037
14. It frightens me when I do not understand what the teacher is saying in English	0.646/0.635	−0.191/0.270	**0.129/0.147**	−0.022/−0.184	−0.146/0.145
15. It would not bother me at all to take more foreign language classes	0.476/−0.375	**0.386/0.240**	−0.261/0.553	0.093/−0.059	−0.031/0.074
16. During my English class, I find myself thinking about things that have nothing to do with the course	0.337/0.364	**0.100/−0.219**	0.430/0.516	0.114/−0.347	−0.237/0.262
17. I keep thinking that the other students are better at English than I am	0.714/0.668	0.315/−0.104	−0.040/−0.063	**−0.369/0.407**	−0.064/0.168
18. I am usually at ease during English tests in my class	0.631/−0.433	0.179/0.038	−0.295/0.344	−0.077/0.305	**−0.026/0.238**
19. I start to panic when I have to speak without preparation in the English class	**0.691/0.753**	−0.239/0.190	−0.189/−0.063	−0.102/−0.022	−0.148/0.139
20. I worry about the consequences of failing my English class	0.554/0.549	**0.197/−0.139**	0.080/0.030	−0.227/0.421	−0.403/−0.022
21. I do not understand why some people get so upset over English classes	0.557/−0.378	**0.246/0.179**	−0.283/0.394	0.294/0.130	−0.321/0.391
22. In the English class, I can get so nervous I forget things I know	0.665/0.690	**−0.111/0.103**	0.171/0.179	−0.112/−0.037	−0.235/−0.021
23. It embarrasses me to volunteer answers in my English class	**0.716/0.705**	−0.234/0.181	−0.011/0.083	0.000/−0.005	−0.055/0.210
24. I would not be nervous speaking English with native speakers	**0.541/−0.451**	−0.245/−0.164	−0.324/0.472	0.167/0.006	0.131/−0.090
25. I get upset when I do not understand what the teacher is correcting	0.569/0.572	−0.090/0.335	**0.175/0.180**	0.295/0.005	−0.100/0.322
26. Even if I am well prepared for the English class, I feel anxious about it	0.674/0.669	**−0.100/0.094**	0.153/0.235	−0.005/−0.081	0.099/0.202
27. I often feel like not going to my English class	0.548/0.553	**0.213/−0.271**	0.213/0.287	0.267/−0.348	−0.188/−0.020
28. I feel confident when I speak English in class	**0.677/−0.588**	0.094/0.046	−0.310/0.479	−0.018/0.068	0.128/−0.043
29. I am afraid that my English teacher is ready to correct every mistake I make	0.577/0.553	−0.108/−0.062	**0.263/0.382**	0.265/−0.190	0.162/−0.150
30. I can feel my heart pounding when I'm going to be called on in the English class	**0.694/0.680**	−0.387/0.255	−0.047/0.018	−0.124/−0.002	−0.013/−0.187
31. The more I study for an English test, the more confused I get	0.545/0.551	0.245/−0.455	0.434/0.317	−0.086/0.067	**0.182/0.013**
32. I do not feel pressure to prepare very well for the English class	0.505/−0.403	**0.467/0.384**	−0.117/0.405	−0.075/0.083	0.369/−0.346
33. I always feel that the other students speak English better than I do	00.713/0.694	0.206/−0.129	0.013/−0.103	**−0.380/0.436**	0.017/0.060
34. I feel very self-conscious about speaking English in front of other students	**0.796/0.837**	−0.124/0.040	−0.017/0.049	−0.128/0.048	0.013/−0.040
35. The English class moves so quickly I worry about getting left behind	0.677/0.700	**0.185/−0.105**	0.225/0.317	0.051/−0.077	−0.011/−0.103
36. I feel more tense and nervous in my English class than in my other classes	0.765/0.756	**0.126/−0.007**	−0.043/0.090	0.044/−0.143	−0.043/−0.270
37. I get nervous and confused when I am speaking English in class	**0.824/0.813**	−0.052/0.032	0.037/0.006	0.082/−0.051	0.029/−0.181
38. When I'm on my way to the English class, I feel very sure and relaxed	0.672/−0.527	**0.287/0.115**	−0.225/0.344	0.187/0.222	−0.017/−0.202
39. I get nervous when I do not understand every word the English teacher says	0.614/0.619	−0.108/0.169	**0.238/0.266**	0.115/0.061	−0.019/−0.110
40. I feel overwhelmed by the number of rules I have to learn to speak English	0.641/0.623	0.100/−0.436	**0.440/0.169**	0.048/0.118	0.114/−0.098
41. I am afraid that the other students will laugh at me when I speak English	0.718/0.723	−0.109/−0.102	**0.154/0.095**	0.030/−0.016	0.200/−0.069

Table 1: Continued.

ELCAS items	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
42. I would probably feel comfortable around native speakers of English	**0.509/−0.285**	−0.025/−0.038	−0.405/0.516	0.431/0.332	0.118/−0.276
43. I get nervous when the English teacher asks questions which I have not prepared in advance	**0.738/0.745**	−0.298/0.302	−0.034/−0.049	0.092/0.127	0.019/−0.206
44. I get tense and nervous when talking to a person whose sex is opposite to mine	**0.489/0.639**	−0.214/0.065	0.178/0.097	−0.217/−0.038	0.374/−0.078
45. I get tense and nervous when I have to discuss things unfamiliar to me in English	**0.691/0.666**	−0.266/0.230	−0.152/−0.121	−0.037/0.312	0.044/−0.135
46. I feel overwhelmed by the number of words I have to learn to speak English	0.524/0.659	0.208/−0.243	**0.302/0.088**	0.135/0.122	0.210/0.004

Table 2: Characteristics of instruments.

Phase	Measures	No. of items	Reliability	Mean item-total correlation ($p = 0.01$)
Phase 1 ($N = 324$)	ELCAS	36	0.956	0.602
	Debilitating Anxiety Scale (DAS)	10	0.885	0.617
	Facilitating Anxiety Scale (FAS)	9	0.797	0.486
Phase 2 ($N = 324$)	ELCAS	36	0.878	0.39
	Debilitating Anxiety Scale (DAS)	10	0.901	0.652
	Facilitating Anxiety Scale (FAS)	9	0.799	0.488

Table 3: Eigenvalues and explained variances of ELCAS factors.

	Phase 1		Phase 2	
	Eigenvalue	% of total variance	Eigenvalue	% of total variance
ELCAS1	14.592	40.533	13.662	37.951
ELCAS2	2.005	5.571	2.846	7.907
ELCAS3	1.656	4.600	1.494	4.419
ELCAS4	1.161	3.225	1.408	3.912
ELCAS5	1.055	2.932	1.214	3.373
ELCAS6			1.103	3.064

Table 4: Correlations between ELCAS scales ($N = 324$).

	ELCAS2	ELCAS3	ELCAS4	ELCAS5	ELCAS
ELCAS1	0.786**/0.649**	0.780**/0.743**	0.639**/0.607**	0.609**/0.363**	0.937**/0.917**
ELCAS2	1/1	0.773**/0.636**	0.694**/0.380**	0.706**/0.273**	0.925**/0.827**
ELCAS3		1/1	0.609**/0.547**	0.638**/0.275**	0.895**/0.886**
ELCAS4			1/1	0.614**/0.191**	0.751**/0.664**
ELCAS5				1/1	0.741**/0.385**

Note. Each column presents the coefficients in phases 1 and 2, respectively, separated with a slash; ** $p < 0.001$; coefficient of determination: small = $r \leq 0.1$; medium = $r = 0.3$; large = $r \geq 0.5$ [49]. ELCAS1 = fear of speech communication in English; ELCAS2 = worry about the English class; ELCAS3 = worry about one's own English classroom performance; ELCAS4 = worry about peers' classroom performance; ECLAS5 = worry about tests.

($r = 0.385$~0.937, $p \leq 0.001$) in both phases, with a large effect size for most coefficients.

As shown in Table 5, the ELCAS factors were highly significantly correlated with DAS ($r = 0.188$~0.699, $p \leq 0.001$) in both phases and with FAS ($r = -0.153$~-0.305, $p \leq 0.006$) in phase 1, largely with a medium effect size for all the coefficients (To avoid Type I errors, Bonferroni correction was carried out in the analyses, with the threshold of p lowered from 0.05 to 0.006 and from 0.01 to 0.001.). Meanwhile, DAS and FAS ($r = -0.169$~-0.403, $p < 0.006$) were significantly negatively related to each other in both phases, with a medium effect size.

4.1. Changes in Anxiety in Two Phases. In order to explore changes in anxiety in two phases, paired samples t-tests were run and the results are reported in Table 6.

As shown in Table 6, the respondents scored higher on all ELCAS scales except ELCAS5 and FAS in phase 1 than in phase 2. And the differences were all statistically significant ($t = -2.34$~10.26) except in DAS and FAS, largely with a medium effect size ($d = 0.12$~0.71), as proved by paired samples t-test results presented in Table 6. Alternatively, compared with phase 2, the participants self-reported to be significantly more apprehensive of speech communication in English (ELCAS1) and more worried about the English

Table 5: Correlations between ELCAS and AAT ($N = 324$).

	ELCAS1	ELCAS2	ELCAS3	ELCAS4	ELCAS5	ELCAS	FAS
DAS	0.516**/0.663**	0.578**/0.514**	0.586**/0.639**	0.446**/0.505**	0.540**/0.188**	0.606**/0.699**	−0.403**/−0.169*
FAS	−0.213**/−0.010	−0.305**/−0.008	−0.188**/−0.067	−0.153*/−.083	−0.255**/0.241**	−0.257**/−0.028	1/1

Note. Each column presents the coefficients in phases 1 and 2, respectively, separated with a slash; ** $p < 0.001$; * $p < 0.006$ coefficient of determination: small = $r \leq 0.1$; medium = $r = 0.3$; large = $r \geq 0.5$.

Table 6: Means and SDs of ELCAS and AAS scales in two phases ($N = 324$).

	Phase 1			Phase 2			Paired samples t-test results (df = 323)		
	Mean	SD	Range	Mean	SD	Range	t	p	Cohen's d
ELCAS1	3.21	0.77	1–5	2.92	0.54	1.69–4.69	7.96**	0.00	0.44
ELCAS2	3.01	0.69	1–4.64	2.6	0.44	1.45–5	10.26**	0.00	0.71
ELCAS3	2.87	0.73	1–5	2.65	0.63	1.12–4.50	6.35**	0.00	0.32
ELCAS4	3.51	1.05	1–5	3.38	1.03	1–5	2.66**	0.01	0.12
ELCAS5	2.89	0.81	1–5	3.02	0.65	1–5	−2.34*	0.02	0.18
ELCAS	3.07	0.68	1–4.89	2.78	0.46	1.72–4.78	9.11**	0.00	0.5
DAS	2.84	0.74	1–5	2.9	0.75	1–5	-1.73	0.08	—
FAS	3.01	0.58	1.44–5	2.99	0.57	1–4.44	0.66	0.51	—

Notes. ** $p \leq 0.01$ * $p \leq 0.05$. Effect size of Cohen's d: small = $d \leq 0.2$; medium = $d = 0.5$; large = $d \geq 0.8$ [49].

class (ELCAS2), their own classroom (ELCAS3), and other students' classroom performance (ELCAS4) in phase 1. Their overall English language classroom anxiety was significantly higher in phase 1 as well. Nevertheless, they tended to become significantly more worried about tests in phase 2. Although their debilitating anxiety score became higher and facilitating anxiety score became lower in phase 2, no statistically significant difference was observed.

4.2. Effects of Anxiety on English Test Performance

4.2.1. Correlations between Test Scores and ELCAS and AAS Scales. To examine the effects of anxiety on students' English test performance, correlation analyses were first run between English test scores and ELCAS and AAS scales (To avoid Type I errors, Bonferroni correction was carried out in the analyses, with the threshold of p lowered from 0.05 to 0.006 and from 0.01 to 0.001.). Then, multiple stepwise regression analyses were conducted, with English test scores as dependent variables and ELCAS and AAS scale scores as independent variables.

As reported in Table 7, in phase 1, the ELCAS scales were significantly inversely related to speaking test scores ($r = -0.264 \sim -0.392$, $p < 0.001$), listening test scores ($r = -0.158 \sim -0.256$, $p < 0.006$), and the overall test scores ($r = -0.265 \sim -0.317$, $p < 0.001$); ELCAS4 and ELCAS5 were significantly inversely related to reading scores ($r = -0.160 \sim -0.169$, $p < 0.006$); writing test scores were significantly negatively related to ELCAS1, ELCAS2, ELCAS4, and ELCAS ($r = -0.155 \sim -0.174$, $p < 0.006$); and DAS was significantly negatively related to overall test scores ($r = -0.180$, $p < 0.001$). This means that a student with greater English language classroom anxiety tended to score lower in the English test. It also means that a student with higher debilitating anxiety tended to perform less well in the English test in phase 1.

Table 7 also shows that in phase 2, speaking test scores were significantly negatively correlated with ELCAS1, ELCAS3, ELCAS4, and ELCAS ($r = -0.187 \sim -0.267$, $p < 0.001$); listening test scores were significantly inversely correlated with ELCAS4 ($r = -0.158$, $p < 0.006$); reading test scores were significantly negatively correlated with ELCAS3, ELCAS4, and ELCAS ($r = -0.165 \sim -0.188$, $p < 0.006$); and overall test scores were significantly negatively correlated with all ELCAS scales except ELCAS2 and ELCAS5 ($r = -0.191 \sim -0.268$, $p < 0.001$). In addition, DAS was significantly negatively correlated with overall test scores ($r = -0.156$, $p < 0.006$) while FAS was significantly positively correlated with speaking test scores ($r = 0.174$, $p < 0.006$). Namely, in phase 2, a student with greater English language classroom anxiety tended to perform worse in the speaking test and the overall test and that a student with higher debilitating anxiety tended to score lower in the overall test, but a student with higher facilitating anxiety tended to perform better in the speaking test. Meanwhile, a student with greater worry about other students' classroom performance tended to score lower in the listening and reading tests, and a student with greater worry about classroom performance and/or higher overall English language classroom anxiety tended to perform worse in the reading test.

Furthermore, comparison of the coefficients in two phases revealed that fewer significant coefficients were observed and that the coefficients generally tended to be smaller in phase 2, although most significant coefficients had a medium effect size.

4.2.2. Predictors of English Test Performance. Results of regression analyses in phase 1 are reported in Table 8. As reported in Table 8, 3 models were resulted with the change in R^2 being all significant for speaking test scores: 0.154 for model 1 (ELCAS1), 0.011 for model 2 (ELCAS1 and ELCAS5), and 0.020 for model 3 (ELCAS1, ELCAS5, and DAS). Of the three variables included in model 3, ELCAS1 (fear of speech communication in English) ($\beta = -0.364$, $t = -5.498$) was the most powerful predictor, followed by

Table 7: Correlations between ELCAS and AAT scales ($N = 324$).

	ELCAS1	ELCAS2	ELCAS3	ELCAS4	ELCAS5	ELCAS	DAS	FAS
Speaking	−0.392**/ −0.248**	−0.328**/ −0.138	−0.286**/ −0.187**	−0.264**/ −0.267**	−0.322**/- 0.028	−0.375**/ −0.233**	−0.118/−0.143	0.129/ 0.174*
Listening	−0.256**/ −0.100	−0.190**/ −0.027	−0.217**/ −0.094	−0.158*/ −0.158*	−0.217**/ −0.096	−0.244**/ −0.100	−0.147/−0.117	0.024/ 0.091
Reading	−0.097/−0.122	−0.134/ −0.133	−0.121/ −0.167**	−0.160*/ −0.188**	−.169*/ −0.083	−0.136/−0.165*	−0.104/−0.094	0.063/ 0.014
Writing	−0.161*/−0.096	−0.158*/ 0.056	−0.086/−0.052	−0.174*/−0.090	−0.061/0.053	−0.155*/−0.044	−0.074/−0.023	0.163*/ 0.052
Total	−0.304**/ −0.191**	−0.276**/ −0.089	−0.265**/ −0.194**	−0.265**/ −0.268**	−0.300**/ −0.104	−0.317**/ −0.202**	−0.180**/ −0.156*	0.101/ 0.105

Note. Each column presents the coefficients in phases 1 and 2, respectively, separated with a slash; $^{*}p \leq 0.006$; $^{**}p \leq 0.001$.Coefficient of determination: small $= r \leq 0.1$; medium $= r = 0.3$; large $= r \geq 0.5$.

Table 8: Multiple regression coefficients and significance of Predictors for Performance in English (phase 1).

		ELCAS1	ELCAS5	DAS
Speaking	β	−0.364	−0.195	0.176
	t	−5.498**	−2.888**	2.811**
	p	0.000	0.004	0.005
	VIF	1.725	1.785	1.533
	Cohen's f^2	0.18	0.2	0.22
Listening	β	−0.256		
	t	−4.76**		
	p	0.000		
	VIF	1		
	Cohen's f^2	0.07		
Reading	β		−0.169	
	t		−3.083**	
	p		0.002	
	VIF		1	
	Cohen's f^2		0.03	
	ELCAS4	FAS	ELCAS	
Writing	β	−0.153	0.139	
	t	−2.777**	2.531*	
	p	0.006	0.012	
	VIF	1.024	1.024	
	Cohen's f^2	0.031	0.052	
Total	β			−0.317
	t			−5.993**
	p			0.000
	VIF			1
	Cohen's f^2			0.11

Note. $^{**}p \leq 0.01$; $^{*}p \leq 0.05$. Effect size of Cohen's f^2: small $= f^2 \leq .02$; medium $= f^2 = .15$; large $= f^2 \geq .35$ [49].

ELCAS5 ($\beta = -0.195$, $t = -2.888$) and DAS ($\beta = 0.176$, $t = 2.811$), respectively, with effect sizes being all medium ($f^2 = 0.18$~0.22). Meanwhile, regression analyses yielded 1 model (ELCAS1) (change in $R^2 = 0.066$) for listening test scores, 1 model (ELCAS5) (change in $R^2 = 0.029$) for reading test scores, and 1 model (ELCAS) (change in $R^2 = 0.100$) for overall test scores. Namely, ELCAS1 ($\beta = -0.256$, $t = -4.76$), ELCAS5 ($\beta = -0.169$, $t = -3.083$), and ELCAS ($\beta = -0.317$, $t = -5.993$) were powerful negative predictors for listening, reading, and overall test scores, respectively, with a medium but to the lower end effect size ($f^2 = 0.03$~0.11). In addition, the analyses produced 2 models with the change in R^2 being all significant for writing test scores: 0.030 for model 1 (ELCAS4) and 0.019 for model 2 (ELCAS4 and FAS). Among the two variables included in model 2, ELCAS4 ($\beta = -0.153$, $t = -2.777$) was the most powerful negative predictor while FAS ($\beta = 0.139$, $t = 2.531$) was a powerful positive predictor, with a medium but to the lower end effect size ($f^2 = 0.031$~0.052).

Results of regression analyses in phase 2 are reported in Table 9, which show that the analyses produced 3 models with the change in R^2 being all significant for speaking test scores: 0.071 for model 1 (ELCAS4), 0.023 for model 2 (ELCAS4 and FAS), and 0.013 for model 3 (ELCAS4, FAS, and ELCAS1). Of the three variables included in model 3, ELCAS4 ($\beta = -0.164$, $t = -2.44$) was the most powerful predictor, followed by FAS ($\beta = 0.159$, $t = 2.992$) and ELCAS1 ($\beta = -0.174$, $t = -2.188$), respectively, with effect sizes being all medium ($f^2 = 0.076$~0.12). Meanwhile, 1 model was resulted for listening (ELCAS4) (change in $R^2 = 0.025$), reading (ELCAS4) (change in $R^2 = 0.036$), and overall test scores (ELCAS4) (change in $R^2 = 0.072$), respectively. Namely, ELCAS4 was a powerful negative predictor for listening ($\beta = -0.158$, $t = -2.865$), reading ($\beta = -0.188$, $t = -3.433$), and overall ($\beta = -0.268$, $t = -4.972$) test scores, with effect sizes being all medium but to the lower end ($f^2 = 0.026$~0.078). No models were produced for writing test scores.

5. Discussion

Factor analyses and correlation analyses, as well as reliability analysis, showed that the ELCAS was highly reliable and valid and that the ELCAS and AAT scales measured the anxiety the participants experienced in this study.

5.1. Changes in Foreign Language Anxiety over the Period. Analyses of the data showed that the respondents became significantly less apprehensive of speech communication in English and less worried about the English class, their own, and other students' classroom performance in phase 2. Their overall English language classroom anxiety was significantly lower in phase 2 as well. All these findings were consistent with those in earlier studies [3, 17, 20, 22]. As discussed in the current literature [17, 22, 29], the lowered anxiety could

Table 9: Multiple regression coefficients and significance of Predictors for Performance in English (phase 2).

		ELCAS4	FAS	ELCAS1
Speaking	β	−0.164	0.159	−0.174
	t	−2.44*	2.992**	−2.188*
	p	0.015	0.003	0.029
	VIF	1.608	1.01	1.597
	Cohen's f^2	0.076	0.104	0.12
Listening	β	−0.158		
	t	−2.865**		
	p	0.004		
	VIF	1.000		
	Cohen's f^2	0.026		
Reading	β	−0.188		
	t	−3.433**		
	p	0.001		
	VIF	1.000		
	Cohen's f^2	0.037		
Total	β	−0.268		
	t	−4.972**		
	p	0.000		
	VIF	1.000		
	Cohen's f^2	0.078		

Note. $^{*}p \leq 0.05$ $^{**}p \leq 0.01$. Effect size of Cohen's f^2: small $= f^2 \leq 0.02$; medium $= f^2 = 0.15$; large $= f^2 \geq 0.35$ [49].

be attributed to various factors, such as increased exposure and use of English, more familiarity with the classroom learning environment (including peers, the instructor, and the teaching mode). It might also be partly thanks to the nature of the course, which aimed to improve students' listening, speaking, reading, and writing skills and adopted an integrated teaching and learning method. Moreover, as postgraduate students, they might be cognitively more mature and psychologically more motivated than their undergraduate counterparts in most current studies. They, thus, became less anxious as they got accustomed to their English learning environment, further confirming the belief that FLA is dynamic as it works with other affective, linguistic, and learner variables.

Nevertheless, the respondents tended to become significantly more worried about tests in phase 2, although no statistically significant difference was observed in debilitating anxiety or facilitating anxiety. The mixed results might suggest that the difficulty of both pretests and posttests triggered the increasing anxiety toward tests, as shown in Table 10. As discussed in [50], the difficulty of the pretest might lead to the accumulation of fear and avoidance of the posttest in the present study. Further, perceived test difficulty and actual test difficulty can significantly impact students' test anxiety, as evidenced in [51, 52]. Alternatively, students display higher level of test anxiety toward highly difficult exam items, as found in the present study.

5.2. Effects of Anxiety on English Test Performance. Correlation analyses revealed that in both phases, the ELCAS and AAT scales were largely highly related to students' performance in English speaking, listening, reading, and writing tests as well as the overall test, especially speaking

Table 10: Means and standard deviations of the pretest and posttest scores ($N = 324$).

	Pretest			Posttest		
	Mean	SD	Range	Mean	SD	Range
Speaking	17.99	1.78	12–22	20.15	1.40	13–23
Listening	7.41	5.84	0–25	9.89	6.38	0–25
Reading	10.97	6.01	0–25	8.21	5.29	0–25
Writing	17.47	1.56	10–22	18.57	1.94	2–22
Total	53.87	9.83	33–88	56.83	9.54	35–87

test performance, similar to the findings in the current literature [1, 5, 6, 7, 8, 9, 11, 28, 37, 38]. Comparison of the coefficients in both phases showed that in phase 1, the ELCAS scales were significantly inversely related to speaking, listening, and the overall test scores; ELCAS4 and ELCAS5 were significantly inversely related to reading test scores; writing test scores were significantly negatively related to ELCAS1, ELCAS2, ELCAS4, and ELCAS; and DAS was significantly negatively related to overall test scores. Nevertheless, fewer ELCAS scales were significantly negatively correlated to students' speaking, listening, reading, writing, and overall test performance, and the correlations generally became weaker in phase 2, as reported in Table 7. This might largely be because the participants became significantly less anxious toward the end of the period. These findings imply that not only FLA is changing but also the relationship between FLA and SL/FL learning outcomes is changing, which needs to be supported in future research.

Meanwhile, regression analyses revealed that ELCAS and AAT scales were good predictors for students' performance in English, especially speaking test performance in both phases. This means that foreign language anxiety and achievement anxiety had significant predicting effects on students' performance in a SL/FL, as found in similar earlier research [9, 11, 53].

Moreover, Table 7 shows that ELCAS scales were significantly correlated with students' speaking test performance in both phases while fewer ELCAS scales were significantly related to other types of test performance in phase 2 and that DAS was significantly negatively related to overall test performance in phase 1 and FAS was significantly positively correlated with speaking test performance in phase 2. Regression analyses revealed a similar trend: more ELCAS scales powerfully predicted students' speaking test performance than other types of test performance in both phases. These findings seem to further support the long-lasting belief that speaking is the most anxiety-provoking activity in SL/FL learning [1, 6, 27, 29]. This is especially so in EFL contexts, where English is seldom spoken in everyday life.

Furthermore, regression analyses revealed that ELCAS1, FLCAS4, ELCAS5, and FAS were more powerfully causally related to students' test performance. These results imply that fear of speech communication in English, worry about other students' performance or peer pressure, worry about tests, and facilitating anxiety are strong causes for students' test performance, especially speaking test performance, partially supporting learners' self-reports of causes for and consequences of anxiety [2, 27, 29, 46].

All these findings indicate that FLA is an important issue even for postgraduate students, further confirming that FLA is an important factor affecting SL/FL learning outcomes. Moreover, as reviewed and researched in [54, 55], anxiety not only exists in language learning but also in almost all other subjects of learning at various educational levels such as mathematics, psychology, statistics, engineering, and business. Furthermore, it can lead to various consequences, such as delayed assignments, lower academic achievements, decreased satisfaction, and even dropout [27, 33, 56]. Anxiety, thus, deserves serious attention from learners, educators, and administrators as well as those involved in education. It might be the time to consider whether and how to incorporate anxiety into the teaching curriculum and testing rubrics. To better understand and handle it, more research is always needed considering the diversity of student populations and complexity of learning.

6. Conclusions and Implications

The present quantitative study examined changes in and effects of FLA on postgraduate students' performance in English over a 10-week period. The study revealed the following main findings:

(1) Toward the end of the period, the respondents became significantly less apprehensive of speech communication in English and less worried about the English class and their own as well other students' classroom performance, yet significantly more worried about tests.

(2) In both phases, the ELCAS and AAT scales were largely highly related to students' performance in English speaking, listening, reading, and writing tests as well as the overall test, especially speaking test performance. Nevertheless, this correlation became weaker in phase 2.

(3) In both phases, ELCAS and AAT scales powerfully predicted students' English test performance, especially speaking test performance.

These findings clearly show that FLA is an important issue even for postgraduate students, further confirming that FLA is an important factor affecting language learning outcomes at various educational levels. Consequently, how to reduce anxiety and its negative impact in SL/FL learning is an important issue for both SL/FL instructors and learners [34, 57, 58, 59, 60]. As discussed in [27, 61] and [11, 23, 29], building a friendly classroom atmosphere, being mutually supportive and empathetic, increasing exposure to and the use of the target language, and improving students' proficiency in the target language are all conducive to anxiety reduction in SL/FL learners. As proposed in [26], positive learning experiences and progressive learning results lead to reduced anxiety. A rather intensive environment tends to trigger the coping mechanism with anxiety and a favorable learning achievement leads to reduced anxiety [11, 21, 29]. According to these researchers, efforts in a favorable physical learning space, emotional rapport, and teacher-student interactions are effective in reducing anxiety; a learning environment with low stress delivers more enjoyable instructions and renders possible anxiety reduction. In addition, instructional delivery proves to be useful to reduce anxiety [16, 50]. For example, Tobias [50] highlighted the effects of different instructional delivery modes and the adopted instructional delivery content in reducing negative impacts of anxiety by reviewing anxiety reduction programs. Reference [16] discussed a specific instructional method of confidence-building exercises, which enabled students to overcome the anxiety.

Coping strategies are necessary, especially when FLA proves to change over time and exerts varying effects on learners' test performance accordingly, as found in the present study and the current literature. Nevertheless, what causes FLA to change over time needs to be further researched, better via qualitative data collection methods such as documenting students' learning profiles and emotional status and eliciting their own perceptions and reflections on anxiety. Findings from such data will not only complement those of quantitative data but also help better illustrate how anxiety changes and affects SL/FL learning over time. In addition, the findings of the present study need to be validated in that the participants were cognitively more mature and psychologically more motivated adults and that the purpose of the course was to improve their English listening, speaking, reading, and writing skills. A different learner population may result in different findings. Furthermore, as shown in [54, 55], anxiety exists in various subjects of learning, and it will be meaningful to explore levels of, causes for, and consequences of anxiety in students when learning different subjects. This shall be performed in future research, which will enable us to look further into the complex nature of anxiety and its role in learning.

Data Availability

The research data can be accessed upon request.

Ethical Approval

This research received ethics clearance from the Graduate School at Shenzhen, Tsinghua University. The authors provided sufficient information about this research and received consent from participants before conducting the research. Participants participated in the research on a voluntary basis, and they could withdraw from the research at any time. Personal data of participants were replaced with anonymous identifiers and treated confidentially.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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