

The Relationships between EFL Anxiety, Elaboration Strategies, and Achievement Among Chinese Adolescents

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Abstract:- The control-value theory posits that negative achievement emotions would have adverse effects on the key indicators of school outcomes. Studies have confirmed the negative correlation between academic anxiety and academic achievement. However, studies on the possible mediating effects of cognitive strategies between academic anxiety and achievement are lacking. The present study explored the relationship between foreign language (FL) anxiety, elaboration strategies, and FL achievement in a sample of 501 Chinese adolescents ($M_{age} = 13.67$, $SD = .62$). Results of structural equation modelling (SEM) and mediation analyses demonstrated that elaboration strategies mediated the relationship between FL anxiety and achievement after controlling for gender and age. Furthermore, mediation analyses found that FL anxiety had no direct effect on FL achievement, indicating that elaboration strategies fully mediated the relationship between FL anxiety and achievement. Implications, limitations, and directions for further studies are discussed.

Keywords:- FL Anxiety, Elaboration Strategies, FL Achievement, Mediation Mechanism, Chinese Adolescents.

I. INTRODUCTION

Academic anxiety is a common achievement emotion in learning English as a foreign language (EFL), which is usually generated by low-control appraisals and high-value appraisals [1,2]. In the Chinese education system, English is compulsory from elementary school to university [3]. However, with the increasing emphasis on education and the increasingly fierce competition, especially the implementation of the “Double Reduction” policy, the competition of “one test determines the winner” has sunk to the secondary school stage, which makes Chinese adolescents generally suffer from academic anxiety [4]. The adverse effects of academic anxiety on students’ academic achievement [5], learning engagement [6], and psychological well-being [7] have been confirmed.

Given the importance of academic anxiety to the key indicators of school outcomes (e.g., academic achievement), a set of studies were conducted to explore the mediating mechanism between academic anxiety and achievement [6,8,9]. In the previous studies, the mediating effects of social support, academic self-concept, and academic engagement in the relationship between academic anxiety and achievement were identified. However, quite a few studies have explored the potential mediating effect of

cognitive strategies between academic anxiety and achievement, especially in the EFL learning context in China. On the one hand, existing studies found that achievement emotions affect an individual's cognition, self-regulation, and cognitive strategies [10,11]. On the other hand, the link between cognitive strategies and academic achievement was confirmed in a series of studies [12,13]. The present study hypothesized that achievement emotions (e.g., academic anxiety), mediated through cognitive strategies (e.g., elaboration strategies), influence students' academic achievement. Thus, the objective of the present study was to explore the relationship and mediating mechanism between FL anxiety and FL achievement in a sample of Chinese secondary EFL learners.

II. LITERATURE REVIEW

➤ *Foreign Language Anxiety*

Achievement emotions refer to the emotional experience related to academic outcomes or academic activities [1]. Based on qualitative and quantitative studies, nine common discrete emotions were identified, including enjoyment, hope, pride, anxiety, boredom, hopelessness, anger, shame, and relief [10]. Researchers argued that a particular achievement emotion could be described from three dimensions: valence (positive vs. negative), object focus (activity- or outcome-related), and activation (activating or deactivating) [14,15]. In addition, achievement emotions were found to be organized in a domain-specific way (16), suggesting that achievement emotions should be explored within a specific discipline (e.g., English). Also, the control-value theory posits that control and value appraisals are the two proximal antecedents for generating achievement emotions [1]. The present study focused on foreign language anxiety and defined it as the uneasiness and worry experienced by students in the process of learning English. According to the control-value theory and the features of achievement emotions, foreign language anxiety could be described as a negative, activating, outcome-related emotion [17]. EFL learners are prone to foreign language anxiety when their EFL control appraisals are low while their EFL value appraisals are high.

Both the antecedents and consequences of academic anxiety were explored in the existing literature, which provides a strong empirical basis for the present study. For example, the control-value theory postulated that negative achievement emotions (e.g., academic anxiety) would deleteriously affect students' school outcomes (e.g., academic achievement) [1,10]. In the same vein, empirical studies confirmed that academic anxiety was negatively correlated with academic achievement [5,18]. In a study with Israeli female college students, [19] documented that parental expectations were positively correlated with academic anxiety. In another study with college students, [20] documented that EFL listening anxiety was negatively correlated with EFL listening strategies.

Existing studies provided a solid foundation for the theoretical model of this study. However, two deficiencies in existing research that need to be addressed urgently. First, the relationship between academic anxiety and academic achievement in existing studies was inconsistent. That is, in addition to the negative correlation between academic anxiety and academic achievement, some studies held that academic anxiety could promote the improvement of academic achievement [21]. Second, research on the relationship between academic anxiety and cognitive strategies was limited, even less in EFL education. To fill these knowledge gaps, the present study explored the relationship between FL anxiety and achievement in a sample of Chinese adolescent EFL learners.

➤ *Elaboration Strategies*

Elaboration strategies are a type of cognitive strategies, which refer to the deep processing strategy that connects new learning content with prior knowledge in mind to increase the meaning of new learning content [22]. The importance of elaboration strategies to EFL education has been greatly valued. For example, Salwah and Ashari (2015) found that students' academic achievement could be improved by developing their elaboration learning strategies. Geurten et al. (2018) documented that cognitive strategy selection was domain-specific, determining that elaboration strategies should be explored within specific disciplines (e.g., English). Thus, this research defined FL elaboration

strategies as the tendency of an EFL learner to connect the current learning materials with prior knowledge in learning English.

The antecedents and consequences of elaboration strategies have been explored in correlational studies. For instance, [25] documented that the use of elaboration learning strategy was positively correlated with critical thinking skills and academic achievement among senior high school students. In another study among college students, [26] documented that achievement emotions were significantly correlated with self-regulated learning (e.g., elaboration strategies). Although the existing research has not concentrated on foreign language anxiety, based on the literature, it could be postulated that FL anxiety would affect FL achievement through elaboration strategies. The contribution of this research to the literature lies in testing the mediation model (“FL anxiety→elaboration strategies→FL achievement”) with Chinese secondary EFL learners as participants.

➤ *Covariates*

Gender differences in achievement emotions [27], cognitive strategies [28], and academic achievement [29],

suggesting that gender should be controlled while exploring the relationship between FL anxiety, elaboration strategies, and FL achievement. Furthermore, existing studies documented that there were age differences in achievement emotions [30], cognitive strategies [31], and academic achievement [32], showing that age needs to be controlled. In this research, gender and age were controlled as covariates.

➤ *The Present Study*

Based on the control-value theory and literature review of existing studies [1,25,26], this research hypothesized that FL anxiety could affect FL achievement directly or indirectly through elaboration strategies. More specifically, this research aimed to test the following three hypotheses.

- H1: FL anxiety negatively predicts FL achievement.
- H2: FL anxiety is negatively correlated with elaboration strategies.
- H3: Elaboration strategies mediate the relationship between FL anxiety and achievement after controlling for gender and age.

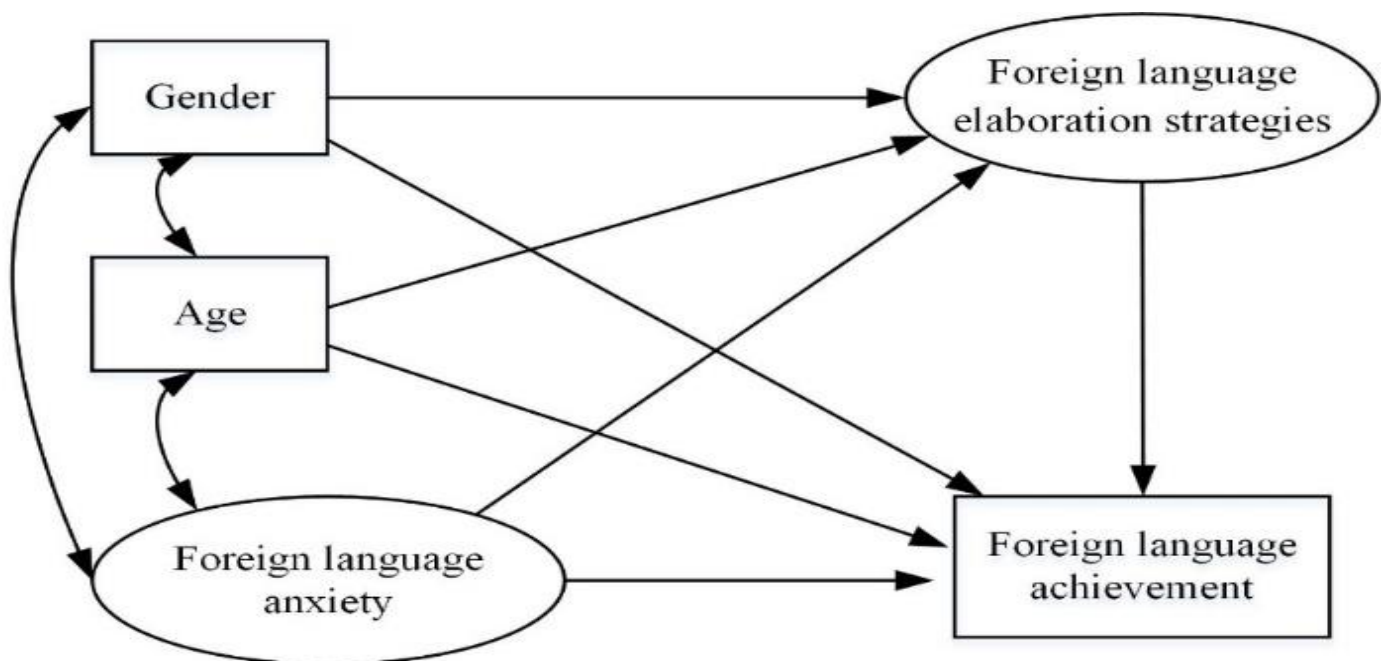


Fig 1 The Proposed Model

III. METHODOLOGY

➤ *Participants*

Five hundred and one participants recruited from a secondary school in Foshan City, Guangdong Province, China, participated in the questionnaire survey. The research school in this study was determined by the convenience sampling method. Participants were 204 seventh graders (40.7%) and 297 eighth graders (59.3%). There were two 263 male students (52.5%) and 238 female students (47.5%). The average age of the participants was 13.67 (SD = .62). Judging from the socioeconomic background, the participants mainly came from middle-class families. Before conducting the questionnaire survey, written informed consent was obtained from the participants and verbal informed consent from their parents or legal guardians.

➤ *Measures*

- *Foreign Language Anxiety Scale*

The four-item foreign language anxiety scale was adapted from the achievement emotions questionnaire [33]. The domain specificity of achievement emotions required us to adapt the items in the original scale to suit the EFL education settings. For example, “I am angry” was adapted as “I am angry when I study English”. Participants’ responses were rated on a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The higher the score, the higher participants’ anxiety level in learning English. The reliability and validity of this scale have been verified in previous studies [34,35]. In this research, the internal consistency of the FL anxiety scale was good, with Cronbach’s alpha equal to .76 (see Table 1).

- *Elaboration Strategies Scale*

The five-item elaboration strategies scale was adopted to measure participants’ use of elaboration strategies in learning English. This scale was adapted from the *goal orientation and learning strategies survey* [36]. One example item of the elaboration strategies scale is “I try to understand how the content I learn in English class fit together with each other”. This scale has been utilized in previous studies and obtained good psychometric properties

[23,37]. The internal consistency of this scale was excellent (Cronbach’s $\alpha = .85$). In the SEM analysis, the variable of elaboration strategies was treated as a latent variable (see Fig. 1).

- *Foreign Language Achievement*

Foreign language achievement was the dependent variable in the proposed model (see Fig. 1). In this research, participants’ English scores in the semester’s final examination were used to represent their foreign language achievement. The English examination paper consisted of five types of questions: listening comprehension (20 points), vocabulary and grammar (25 points), cloze (15 points), reading comprehension (20 points), and writing (20 points). The full score is 100 points, and the higher the score, the better participants’ FL achievement.

➤ *Procedure*

First, the original scales were translated from English to Chinese and then back-translated into English to evaluate whether the items in the related scales were congruent with each other in the English and Chinese versions. With the help of English teachers, the questionnaire survey was conducted in English class and lasted about 20 minutes. Second, participants’ consent was obtained. Third, English teachers collected the completed questionnaires and checked whether there were any missing items. Lastly, researchers entered the survey data into a spreadsheet in preparation for SEM and mediation analyses.

➤ *Data Analysis*

Since the data in this research were self-reported by participants, there might be common method bias. Therefore, it was necessary to assess whether there was common method bias before conducting the mediation analysis. Afterwards, the data analysis was carried out in four steps. First, descriptive statistics of the studies variables, including skewness, kurtosis, and mean value, were performed for the maximum likelihood information. Second, confirmatory factor analysis (CFA) was utilized to test the measurement model’s psychometric properties. Also, FL achievement was added and bivariate correlations analyses between the studied variables were conducted. Third, the relationship

between FL anxiety, elaboration strategies, and FL achievement were explored using SEM. Fourth, the mediating effect of elaboration strategies between FL anxiety and achievement was evaluated using bootstrap estimation. More specifically, the bootstrap estimation was based on 5000 resamples to estimate 95% bias-corrected confidence intervals (BCa 95% CIs) and the indirect effect was considered significant if zero was not included in the BCa 95% CIs [38].

IV. RRESULTS

➤ *Common Method Bias*

Harman’s single-factor test was applied to evaluate the possible problem of common method variance [39]. All the items from all latent variables (i.e., FL anxiety and elaboration strategies) were treated as a single-factor construct, and the model fit of this construct was inferior,

with $\chi^2(27) = 544.674, p < .001, CFI = .658, TLI = .544, RMSEA = .196, 90\% CI [.182, .210], SRMR = .150,$ indicating that common method bias would not be a severe problem in the present study.

➤ *Descriptive Statistics*

The results of descriptive statistics are presented in Table 1. According to the criteria proposed by Roever and Phakiti (2017), $|skewness| < 2$ and $|kurtosis| < 2,$ the constructs of FL anxiety and elaboration strategies demonstrated satisfactory normality for ML estimation. The mean value of Chinese adolescent EFL learners’ anxiety was 3.39 ($SD = .80$), and the use of elaboration strategies was 2.92 ($SD = .50$). These results showed that Chinese adolescent EFL learners experienced high levels of anxiety and moderate levels of use of elaboration strategies in learning EFL.

Table 1 Descriptive Statistics for Studied Latent Variables

	Mean	SD	Skewness	Kurtosis	Cronbach’s α	Factor loadings
FL anxiety	3.39	.80	-.34	.40	.76	.55-.83
Elaboration strategies	2.92	.50	-.15	1.10	.85	.59-.79
FL achievement	.00	.99	-.82	-.21	-	-

➤ *Measurement Models and Latent Bivariate Correlations*

CFA and subsequent analyses conducted in this research were conducted using *Mplus* 8.3 [41]. Hu and Bentler (1999) and Chen (2007) proposed the model fit criteria used in this research. Precisely, the four criteria include the CFI (comparative fit index) and TLI (Tucker-Lewis index) with values greater than .95, RMSEA (root mean square error of approximation) with a value less than .06, and SRMR (standardized root mean square residual) with a value less than .08. Based on these criteria, the measurement model excellently fitted the data, with $\chi^2(26) = 51.167, p < .001, CFI = .983, TLI = .977, RMSEA = .044, 90\% CI [.026, .062], SRMR = .036.$ Besides, the standardized factor loadings of FL anxiety and elaboration strategies ranged from .55 to .83, which satisfied the criterion for factor loadings not lower than .50 [44], suggesting that every item in the relevant scale (e.g., FL anxiety scale) was mandatory.

Table 2 Results of Correlations Matrix for the Variables

	1	2	3	4	5
1 FL anxiety	-				
2 Elaboration strategies	-.13*	-			
3 FL achievement	-.11*	.39***	-		
4 Gender	-.05	.03	.10*	-	
5 Age	-.09	.01	-.10*	-.06	-

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

Latent bivariate correlations between FL anxiety, elaboration strategies, and FL achievement (see Table 2) were tested from a CFA that included gender and age. This CFA ($\chi^2(47) = 75.733, p < .001, CFI = .982, TLI = .975, RMSEA = .035, 90\% CI [.019, .049], SRMR = .033$) demonstrated that this proposed model reasonably fit the data. We found that FL anxiety was negatively correlated with the use of elaboration strategies and FL achievement. Besides, the negative correlation between the use of elaboration strategies and FL achievement was also confirmed. Lastly, this research found gender differences and age differences in FL achievement.

➤ *Structural Equation Modelling and Mediation Analysis*

SEM was utilized to evaluate the proposed model in Fig. 1. The proposed model fitted the data well, with $\chi^2(49) = 80.262, p < .001, CFI = .980, TLI = .974, RMSEA = .036, 90\% CI [.021, .049], SRMR = .038$. Figure 2 displays the proposed model with standardized regression weights. There were five findings. First, FL anxiety was negatively correlated with the use of elaboration strategies ($\beta = -.14, SE = .07, p < .05$). Second, the use of elaboration strategies was positively correlated with FL achievement ($\beta = .38, SE = .04, p < .001$). Third, gender (0 = male and 1 = female) was positively correlated with FL achievement ($\beta = .08, SE = .04, p < .05$), indicating that female EFL learners had higher FL proficiency than their male counterparts. Fourth, age was negatively correlated with FL achievement ($\beta = -.10, SE = .04, p < .05$), showing that FL achievement got worse with age. Fifth, the proportions of explained variances of elaboration strategies were $R^2 = .021$ and FL achievement $R^2 = .175$.

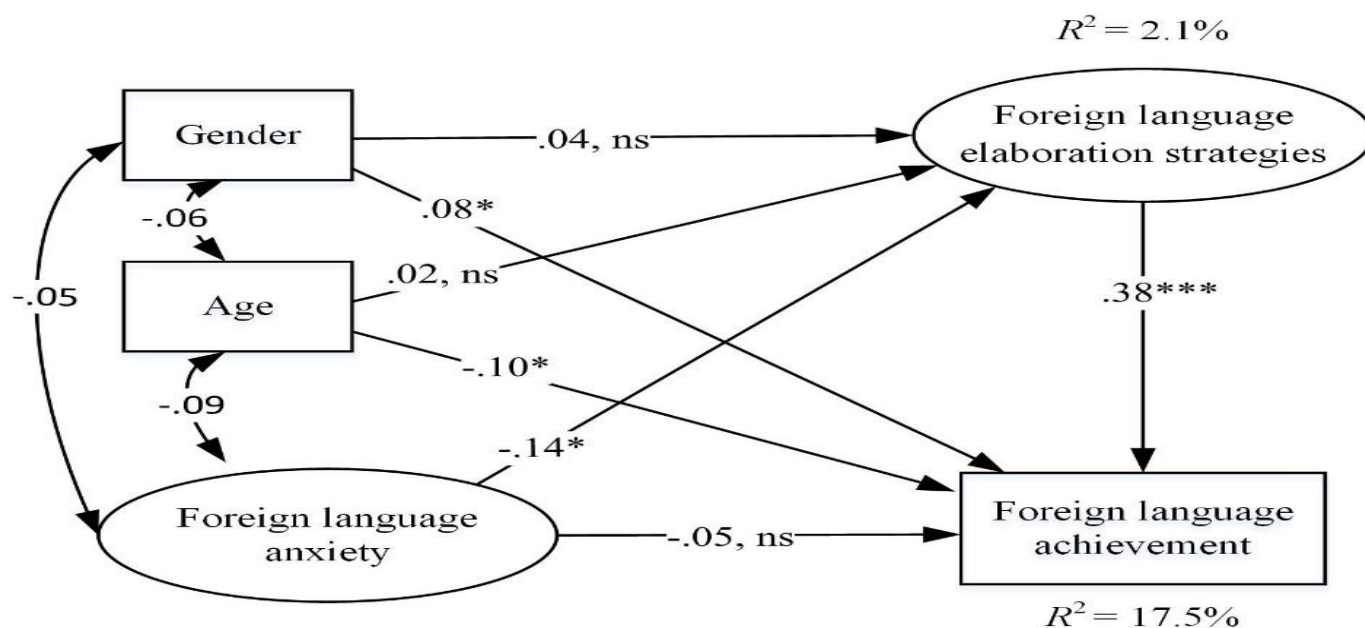


Fig 2 SEM Evaluation of the Relationship between FL Anxiety, Elaboration Strategies, and FL Achievement

- *Note.* All the correlations and path coefficients shown are standardized, and ‘ns’ denotes insignificant coefficients. $^{***} p < .001; ^* p < .05$.

The mediating effect of elaboration strategies between FL anxiety and achievement was examined using bootstrap method with 5000 resamples. The mediating effect was significant if BCa 95% CIs did not include zero [45]. The results of the mediation analysis are shown in Table 3. Elaboration strategies fully mediated the link between FL anxiety and achievement BCa 95% CIs $[-.10, -.01]$, and the direct effect of FL anxiety on achievement was not significant BCa 95% CIs $[-.14, .05]$.

Table 3 Results of Mediation Analysis

Model path	Effect	SE	Bias-corrected CIs 95%	
			Lower	Upper
Total effect	-.10	.05	-.20	-.01
Indirect effect: Anxiety →Elaboration strategies→Achievement	-.05	.03	-.10	-.01
Direct effect	-.05	.05	-.14	.05

V. DISCUSSION

The mediating effect of cognitive strategies in the association between achievement emotions and academic achievement has yet to be explored. This research focused on FL anxiety and explored the potential mediating effect of elaboration strategies between FL anxiety and achievement in a sample of Chinese adolescent EFL learners. The findings have implications for educational theory and practice. In addition, the limitations and areas for further improvement are discussed.

First, the results of the correlations matrix for the studied variables demonstrated that FL anxiety was negatively correlated with FL achievement, and H1 was supported. On the one hand, this finding is consistent with the theoretical hypothesis of the control-value theory [1,10]. On the other hand, some existing studies have also proved that academic anxiety and achievement are negatively correlated [5,18,46]. However, academic anxiety is not without any benefits to school outcomes but rather a continuum of anxiety that even has bright sides [47]. In view of the inconsistency of existing studies, this research found that Chinese adolescents’ FL anxiety level was relatively high, and FL anxiety was negatively correlated with FL achievement. Also, this finding contributes to the literature by providing empirical evidence for the control-value theory.

Second, it was found that FL anxiety was negatively correlated with the use of elaboration strategies, indicating that H2 was supported. This finding can be explained by the resources limitation theory [22]. The resources limitation theory posits that human cognitive resource are limited when processing information, and anxiety would occupy

part of an individual’s cognitive resources and thus squeeze the use of cognitive strategies (e.g., elaboration strategies). Besides, this finding is consistent with previous literature [20,48] . This research contributes to the literature by verifying the negative correlation between FL anxiety and elaboration strategies in Chinese EFL learning. This study enriched research on the relationship between FL anxiety and cognitive strategies and provided empirical evidence for the resource limitation theory.

Third, after controlling for age and gender, it was found that elaboration strategies fully mediated the association between FL anxiety and achievement, showing that H3 was supported. Correlations between achievement emotions and cognitive strategies [20], cognitive strategies and academic achievement [23], and achievement emotions and academic achievement [1,5] have been confirmed. However, to our best knowledge, no studies have explored the relationship between academic anxiety, elaboration strategies, and academic achievement, especially in EFL education. The present study confirmed that elaboration strategies fully mediated the link between FL anxiety and achievement, which reveals the mediating mechanism between FL anxiety and achievement. Moreover, the direction of elaboration strategies’ mediating effect was identified, which might be beneficial for EFL educators to take targeted interventions [49].

Although the research hypotheses have been proved, three deficiencies need to be addressed. First, the reciprocal relationship between FL anxiety, elaboration strategies, and FL achievement could not be identified because the present study was conducted in a cross-sectional design. Accordingly, future studies are suggested to examine the relationship between the three constructs using longitudinal

data. Second, the data of the present study were self-reported. Future research is recommended to collect data from participants' significant others (e.g., parents, teachers, and peers) to improve the objectivity of the data. Third, participants were recruited from the Han cultural region, which concealed the richness of Chinese culture. In addition to Han culture (i.e., Confucian heritage culture), there are fifty-five minority cultures, Taoist culture, and Buddhist culture in China [50]. Therefore, future studies are suggested to recruit participants from more cultures to reflect the actual situation of EFL education in China comprehensively.

There are theoretical and practical implications. On the one hand, this study provides empirical evidence for the control-value theory and the resource limitation theory [1,22]. On the other hand, the negative correlation of FL anxiety with elaboration strategies and FL achievement suggests that EFL educators take measures (e.g., constructing positive teacher-student relationships and adopting effective teaching strategies) to alleviate the adverse effects of FL anxiety [51,52].

VI. CONCLUSION

This research aims to explore the direct and indirect effects of FL anxiety on FL achievement among Chinese adolescent EFL learners. It was found that elaboration strategies could mediate the association between FL anxiety and achievement. Theoretically, this research provides empirical evidence for the control-value and resource limitation theories. Practically, EFL educators are recommended to take measures to alleviate the destructive effects of FL anxiety, enhancing students' use of elaboration strategies and FL achievement.

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