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ORIGINAL RESEARCH

The relationship between academic boredom and EFL achievement: Examining the mediating role of behavioral engagement

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Abstract

In addition to anxiety, academic boredom has also begun to enter the vision of educational researchers in recent years. However, studies on academic boredom in the English as a foreign language (EFL) domain could be more comprehensive, especially the mediating mechanism of academic boredom on EFL achievement needs to be further explored. The present study investigated the direct and indirect effects of academic boredom on EFL achievement in a sample of two hundred and thirty-five Chinese secondary EFL learners. SPSS Process and Mplus were utilized to analyze the data. The findings revealed that academic boredom and behavioral engagement scales were valid and reliable in measuring Chinese secondary EFL learners' boredom and engagement in learning English. Also, mediation analysis showed that behavioral engagement partially mediated between academic boredom and EFL achievement. Implications and directions for future studies are discussed.

Keywords academic boredom; behavioral engagement; EFL achievement; mediation mechanism

1. Introduction

As a kind of negative, deactivating, and activity-related achievement emotions (Pekrun et al., 2007), academic boredom has a negative effect on students' academic outcomes (Sharp et al., 2020; Tze et al., 2016). Pawlak et al. (2020) documented that academic boredom was one commonly experienced emotion in EFL learning. However, due to the inconspicuousness of academic boredom, it has newly become one construct in the EFL domain and has received more and more attention from EFL researchers (Kruk et al., 2021; Li & Li, 2022). Recently, a few studies have explored the effect of academic boredom on the key indicators of academic and well-being outcomes using a correlational design (Li, 2021; Schwartze et al., 2021; Wang & Xu, 2021). For example, Wang and Xu (2021) explored the influence of academic boredom on foreign language learning in a sample of 314 Chinese college EFL learners and identified the negative impact of academic boredom on EFL learning. However, is academic boredom necessarily negative for school outcomes? Hunter et al. (2016) explored the relationship between boredom proneness and curiosity and found that boredom proneness positively predicted curiosity. Given the inconsistency found in the existing studies (Bench & Lench, 2019; Hunter et al., 2016; Li & Li, 2022), the relationship between academic boredom and achievement needs to be further explored, especially in the EFL learning context in China. Also, few studies have explored the mediating mechanism between academic boredom and achievement. To fill these gaps, the present study endeavored to explore the direct and indirect effects of academic boredom on achievement in a sample of 235 Chinese secondary EFL learners.

2. Literature review

2.1. Academic boredom

Academic boredom refers specifically to the destructive feeling experienced by secondary school students in learning EFL, which would negatively influence their EFL outcomes. As one of the nine most commonly experienced achievement emotions during the learning process (i.e., enjoyment, hope, pride, boredom, anxiety, hopelessness, shame, anger, and relief), Pekrun et al. (2007) argued that each discrete achievement emotion could be described from the three

facets of valence (positive vs negative), activation (activating vs deactivating), and object focus (activity-related vs outcome-related). Unlike enjoyment, which is positive, academic boredom is negative. In terms of activation, academic boredom is deactivating, for it might reduce a student's enthusiasm for learning. Concerning object focus, achievement emotions are either activity-related (e.g., boredom and enjoyment) or outcome-related (e.g., pride, anger, and shame) (Pekrun, 2006; Pekrun et al., 2007; Shao et al., 2020). In sum, academic boredom is a kind of negative, deactivating, activity-related achievement emotion.

Driving upon the control-value theory (CVT, Pekrun, 2006), the antecedents and consequences of academic boredom have been explored using a correlational design (Eren & Coskun, 2016; Nakamura et al., 2021; Pawlak et al., 2020; Tze et al., 2014). For example, Eren and Coskun (2016) documented that the level of boredom was negatively correlated with mathematics performance in a sample of 557 Turkish high school students. In another study with Saudi college EFL learners, Shehzad et al. (2021) found that listening boredom could directly affect listening performance or indirectly through the mediators of coping strategies. A meta-analysis by Sharp et al. (2020) focusing on the relationship among academic boredom, student engagement and performance in a cohort of college students found that academic boredom was negatively associated with student engagement and academic performance. Also, Nakamura et al. (2021) explored the possible antecedents of academic boredom and found that activity mismatch, lack of comprehension, insufficient L2 skills, task difficulty, input overload, and lack of ideas all contribute to boredom.

Existing studies provide a theoretical framework for the present study. However, there are at least two deficiencies that need to be resolved. First, the mediating mechanism between academic boredom and achievement was seldom explored, especially in the EFL context (Macklem, 2018). Second, the relationship between academic boredom and the key indicators of academic outcomes (e.g., academic achievement) was inconsistent (Pekrun et al., 2014). To address these two limitations, the present study explored the direct and indirect effects of academic boredom on achievement in a sample of 235 Chinese secondary EFL learners.

2.2. Behavioral engagement

As one of the four aspects of academic engagement (i.e., behavioral, emotional, cognitive, and agentic) (Reeve & Tseng, 2011), behavioral engagement addresses students' involvement in academic, social, and extracurricular activities (Reeve, 2013). Specifically, behavioral engagement concerns secondary school students' various behaviors in learning English (e.g., attention, effort and concentration, teacher-student interaction, frequency of participation in activities, etc.) (Fredricks et al., 2004). The present study focused on behavioral engagement for other types of engagement (e.g., emotional, agentic, and cognitive engagement) that would indirectly affect academic achievement via behavioral engagement (Putwain et al., 2018).

Scholars have extensively studied the antecedents and consequences of behavioral engagement (e.g., Feng & Hong, 2022; Kang & Wu, 2022; Shih, 2018). For example, Kang and Wu (2022) found that behavioral engagement mediated the relationship between academic enjoyment and EFL achievement among teenagers aged 12 to 15. In a sample of 402 eighth-grade Taiwanese students, Shih (2018) documented that achievement goals would affect coping indirectly through engagement. These findings demonstrated that behavioral engagement might mediate the relationship between achievement emotions (e.g., academic boredom) and academic performance, which provides the theoretical framework for the present study.

2.3. EFL achievement

As the most important indicator of learning, academic achievement refers to students' learning outcomes, showing the degree to which students, teachers, and educational institutions have achieved their goals (Sedaghat et al., 2011; Steinmayr et al., 2014). Obtaining high academic achievement indicates that students are successful academically and will be more successful in completing their studies. Given the domain specificity of academic boredom and behavioral engagement (Goetz et al., 2006; Green et al., 2007), the present study explored EFL achievement and defined it as the English scores achieved by Chinese secondary school students.

2.4. The present study

To sum up, the present study attempted to examine the correlation between academic boredom and EFL achievement. Meanwhile, the mediating mechanism between academic boredom and EFL achievement was also explored. Based on the literature review, academic boredom could indirectly affect EFL performance through behavioral engagement. To be specific, the present study attempted to verify the following two hypotheses (see Figure 1).

H_1: EFL-related boredom negatively predicts EFL achievement.

H_2: EFL-related boredom indirectly affects EFL achievement via the mediator of behavioral engagement.

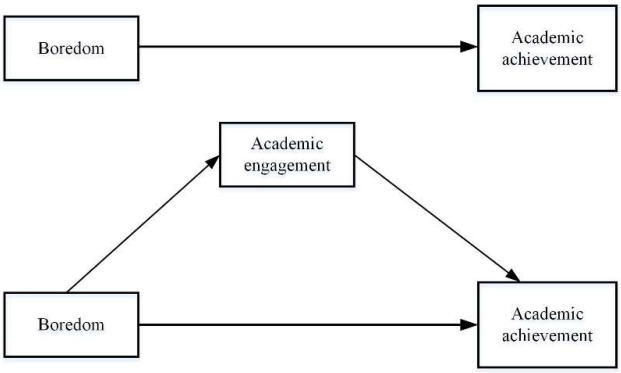

Figure 1. Proposed model

3. Methods

3.1. Participants and procedure

A total of 235 secondary school students from one middle school in Foshan City, China, participated in the study. There were 121 male students (51.49%) and 114 female students (48.51%). The mean age of the participants was 12.81 years (*SD* = .731), ranging from 12 to 14 years old. Participants came from two grades, with 127 in seventh grade (54.04%) and 108 in eighth grade (45.96%). Judging by socio-economic status, participants were mainly from middle-class Chinese families. Participants provided written informed consent before the questionnaire survey began.

With the help of a collaborator and the English teachers, a questionnaire survey was conducted during English class. Although they signed written informed consent, participants were informed that they could withdraw from the questionnaire survey at any point during the questionnaire process. Under the guidance of English teachers, participants completed the questionnaire in approximately fifteen minutes.

3.2. Measures

3.2.1. Academic boredom

The four-item classroom-related boredom that was adopted from the *Achievement Emotions Questionnaires* (Pekrun et al., 2011) was utilized to measure participants' emotional experience of boredom. An example of the academic boredom scale is "I get bored during English class". Participants responded to this scale on a five-Likert scale ranging from 1 = strongly disagree to 5 = strongly agree. The academic boredom scale has excellent internal consistency and construct validity, which has been applied and examined in previous studies (e.g., Kang & Wu, 2021; Shao et al., 2020). In this study, the internal consistency of the academic boredom scale was good, with Cronbach's alpha equal to 0.847.

3.2.2. Behavioral engagement

Participants' engagement in learning English was measured by the 5-item behavioral engagement scale developed from the *Engagement vs. Dissatisfaction with Learning Questionnaire* (Skinner et al., 2009). One example of this scale is "I try hard to do well in English class". This scale was responded to on a five-Likert scale (1 = strongly disagree, 5 = strongly agree). The reliability and validity of the behavioral engagement scale have been identified in previous studies (Wu & Kang, 2021; Zhou et al., 2022). The internal consistency of the behavioral engagement was good for Cronbach $\alpha = 0.909$.

3.2.3. EFL achievement

The most recent English final exam scores were used to represent participants' EFL achievement. The examination paper consists of five types of questions, those are, listening comprehension, vocabulary and grammar, language communication, reading comprehension and writing. The total mark of the examination paper is 120 points. Higher scores indicated higher EFL achievement among the participants.

3.3. Pre-test evaluation of items

A pre-test evaluation of items was conducted to examine the measurement quality of the two scales (i.e., behavioral engagement and academic boredom). According to the size criteria for conducting the pre-test (Oksenberg et al., 1991), fifty-eight participants were involved in assessing the discrimination ability of the items. Accurately, 27 percent of the highest and lowest scores were selected and analyzed (Kelley, 1939). The results are presented in Table 1. It showed that the mean values of each item were significantly different, indicating that all the items in the two studied scales were discriminative. Thus, all items could be applied in the formal investigation.

Table 1. The results of item analysis for pre-test

Items	*t*-test for Equality of Means				Group	*N*	Mean	*SD*
	t	*df*	*p*	Mean Difference				
BO1	-8.059	29	.000	-2.133	Low	16	1.000	0.000
					High	15	3.133	1.060
BO2	-14.132	29	.000	-2.600	Low	16	1.000	0.000
					High	15	3.600	0.737
BO3	-6.660	29	.000	-1.800	Low	16	1.000	0.000
					High	15	2.800	1.082
BO4	-7.107	29	.000	-1.800	Low	16	1.000	0.000
					High	15	2.800	1.014
EG1	-6.959	41	.000	-1.191	Low	19	3.684	.749
					High	24	4.875	.338
EG2	-6.115	41	.000	-.950	Low	19	3.842	.602
					High	24	4.792	.415
EG3	-8.236	41	.000	-1.465	Low	19	3.368	.761
					High	24	4.833	.381
EG4	-7.771	41	.000	-1.213	Low	19	3.579	.607
				-	High	24	4.792	.415
EG5	-7.638	41	.000	-1.340	Low	19	3.368	.597
					High	24	4.708	.550

Note: BO is abbreviation for boredom. EG is abbreviation for behavioral engagement

3.4 Data analysis

Data were analyzed with SPSS 23.0 and *Mplus* 8.3. First, the measurement instrument was validated. In this stage, confirmatory factor analysis (CFA) was conducted using *Mplus* 8.3 and principal component analysis with Varimax rotation, the reliability, convergent validity and discriminant validity were analyzed by SPSS 23.0. Second, simple regression and the PROCESS macro (Model 4) (Hayes, 2022) were utilized to test the hypothesized model (see Figure 1). The bootstrap approach with bootstrapped confidence intervals (CI) of 95% was employed to examine the indirect effects of academic boredom on EFL achievement via the mediator of behavioral engagement. If zero did not include in the CI means that the indirect effect was significant. The results are presented in the next section.

4. Results

4.1. Principal component analysis (PCA)

Sample adequacy and Bartlett's test of sphericity were first conducted to assess that the data were appropriate for principal component analysis. In this study, we adopted the criteria that a KMO value between 0.5 and 0.7 is mediocre, between 0.7 and 0.8 is good, and between 0.8 and 0.9 is excellent (Field, 2013; Hutcheson & Sofroniou, 2006). Results demonstrated that the Kaiser-Meyer-Olkin (KMO) was 0.900, and Bartlett's test of sphericity was significant, with $\chi^2 = 1266.595$, df = 36, $p < .001$, suggesting that the data was appropriate to conduct PCA.

The results of the factor analysis are presented in Table 2. First, the factor loadings of the studied items ranged from 0.689 to 0.846, which were satisfactory for all of them greater than 0.6 (Matsunaga, 2010). In addition, the results of factor analyses showed that no cross-loadings of items were above 0.40 (i.e., with less than 0.4 difference) (Gänswein, 2011), indicating that no items need to be excluded. The eigenvalue values for EFL-related engagement and boredom were 5.101 and 1.354, which satisfied the eigenvalues-greater-than-one criterion proposed by Kaiser (1960). The total variance explained by the two dimensions of behavioral engagement and boredom was 71.72%. Specifically, behavioral engagement explained 56.67% of the total variance, and academic boredom explained 15.05% of the total variance (see Table 2).

Table 2. PCA results for the two dimensions of academic boredom and behavioral engagement

Subscale	Factor loading	
	Boredom	Engagement
BO1	.839	
BO2	.836	
BO4	.777	
BO3	.689	
BEG5		.846
BEG4		.842
BEG2		.838
BEG3		.817
BEG1		.747
Eigenvalues	5.101	1.354
Explained variance	56.673	15.050
Total explained	**71.723**	

4.2. Confirmatory factor analysis

Confirmatory factor analysis (CFA) was

conducted to assess whether the proposed model fits the data well (see Figure 1). First, skewness and kurtosis were used to assess the normal distribution of the data. Byrne (2010) and Hair et al. (2019) proposed that the absolute value of skewness was smaller than two and the absolute value of kurtosis was smaller than seven, indicating that the data was normally distributed. Data were normally distributed as they satisfied the criteria of the skewness and kurtosis values (see Table 3). Also, the comparative fit index (CFI), the Tucker-Lewis index (TLI), the root mean square error of approximation (RMSEA), and the standardized root mean square residual (SRMR) were applied to evaluate the model fit. Typically, RMSEA≤0.06, SRMR≤0.08, CFI and TLI values greater than 0.90 are considered to reflect acceptable fit (Hu & Bentler, 1999; Marsh et al., 2004). The CFA results confirmed the two-factor structure suggested by PCA, since the model fitted the data adequately, with $\chi^2(26) = 67.460$, CFI = .960, TLI = .945, RMSEA = .089, and SRMR = .049. To sum up, all factor loadings were greater than 0.6, and the model indices were adequate, suggesting that satisfactory construct validity was established.

Table 3. Descriptive statistics and factor loadings

Factor	N	Mean	SD	Skewness	Kurtosis
Factor-BO	235	1.87	.905	.939	.281
BO1	235	1.79	1.111	1.480	1.571
BO2	235	2.07	1.113	.737	-.336
BO3	235	1.79	1.073	1.292	.870
BO4	235	1.82	1.076	1.221	.693
Factor-EG	235	4.31	.685	-.751	-.414
EG1	235	4.46	.775	-1.172	.250
EG2	235	4.39	.745	-1.028	.764
EG3	235	4.20	.876	-.902	.400
EG4	235	4.32	.772	-.855	-.075
EG5	235	4.18	.828	-.709	-.021

4.3. Reliability analysis

To test the reliability of the two scales (i.e., EFL-related boredom scale and behavioral engagement scale), inter-item correlation and corrected item-total correlation for each item were analyzed. According to the standards that the value of corrected item-total correlation (above r = 0.40) suggested by Clark and Watson (1995) and the inter-item correlation need to exceed 0.30 (Hair et al., 2019), all items satisfied the criteria, showing that no items need to be omitted from the related scales. Specifically, the corrected item-total correlations for the items of EFL-related boredom ranged from 0.688 to 0.774 and the inter-item correlations of which were greater than 0.40 (see Table 4). For the items of the EFL-related behavioral engagement, the corrected item-total correlations ranged from 0.709 to 0.813, and all the inter-item correlations were greater than 0.40 (see Table 5).

Table 4. Results of reliability for EFL boredom scale

Inter-item Correlation					Internal consistency	
	BO1	BO2	BO3	BO4	Corrected item-total correlation	Cronbach's alpha
BO1	-				.688	.847
BO2	.700	-			.774	
BO3	.503	.612	-		.631	
BO4	.544	.603	.517	-	.647	

Then, Cronbach's alpha was calculated respectively to assess the internal consistency of the boredom and engagement scales. Comrey and Lee (2009) proposed that Cronbach's alpha greater than 0.71 indicated that the reliability of the scale was excellent. The Cronbach's alpha of foreign language boredom was 0.847, and foreign language engagement was 0.909, which was more than the suggested value of 0.70 (Hair et al., 2019). In sum, the reliability of the two scales used in this study was excellent.

Table 5. Results of reliability for EFL-related behavioral engagement scale

Inter-Item Correlation						Internal consistency	
	EG1	EG2	EG3	EG4	EG5	Corrected Item-Total Correlation	Cronbach's alpha
EG1	-					.709	.909
EG2	.642	-				.774	
EG3	.595	.678	-			.757	
EG4	.665	.670	.669	-		.813	
EG5	.598	.689	.693	.785	-	.804	

4.4. Convergent validity

A convergent validity assessment was conducted to examine the degree to which the two studied measures are correlated with each other. Specifically, average variance extracted (AVE) was calculated to assess the convergent validity of the two scales. Hair et al. (2019) suggested that an AVE greater than 0.5 indicated that the related scale has enough convergent validity. In the present study, as demonstrated in Table 6, the AVE values for the EFL-related boredom scale and behavioral engagement scale were 0.620 and 0.670, respectively. The results showed that these two scales had enough convergent validity.

Table 6. Convergent validity and Discriminant validity of the scales

	Convergent validity	Mean	SD	Discriminant validity	
	AVE			BO	EG
BO	.620	1.867	.905	**.787**	
EG	.670	4.311	.685	-.575	**.819**

Note: The diagonal bold is the square root of AVE, and the correlations below the diagonal are Pearson correlation coefficient.

4.5. The predictive effect of EFL boredom on achievement

Simple regression analysis was conducted to examine the potential predictive effect of EFL boredom on achievement. As shown in Table 7, the regression analysis is valid with $F = 48.840$ at $p < .001$. In this study, the regression equation was $Y = 107.201 – 5.649 X$ (X = independent variable of EFL boredom, Y = dependent variable of EFL-related behavioral engagement). Furthermore, Table 7 demonstrated that EFL boredom was negatively correlated with EFL achievement (B = -5.649, t = -6.989, $p < .001$) and explained 41.6% variance (R^2 = .416) of the EFL achievement.

Table 7. Results of regression analysis

Model		Unstandardized Coefficients		t	p	Standardized Coefficients	R^2	F
		B	SE			Beta		
Academic achievement	Constant	107.201	1.676	63.948	.000		.416	48.840***
	BO	-5.649	.808	-6.989	.000	-.416		

Note: *** $p < .001$.

4.6. Behavioral engagement as a mediator between EFL boredom and EFL achievement

A simple mediation model (Model 4) through SPSS PROCESS computational tool (Hayes, 2022) was applied to explore the mediating mechanism between EFL boredom and achievement. Precisely, Model 4 was applied to examine the mediating effect of behavioral engagement between EFL boredom and achievement. The non-parametric bootstrap method with 5000 resamples was adopted to estimate the indirect effect of EFL boredom on EFL achievement via the mediator of behavioral engagement. The bootstrap confidence interval (CI) was used. If 95% CI does not contain zero (Efron, 1988), indicating that the proposed mediating effect is significant.

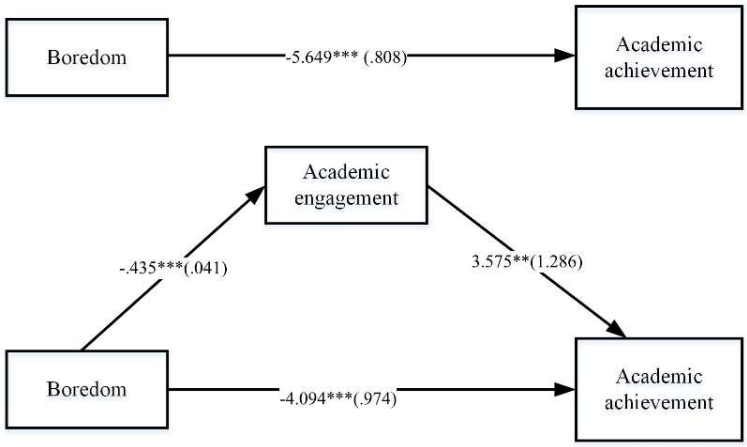

Figure 2. Indirect effect model. All coefficients are unstandardized estimated.
Note: *** p<.001; **p<.01.

As shown in Figure 2, the hypothesized model was supported. EFL boredom was negatively related to behavioral engagement (B = -.435, SE = .041, $p < .001$), and EFL-related behavioral engagement demonstrated a positive predictive effect on EFL achievement (B = 3.575, SE = 1.286, $p < .01$). Also, as demonstrated in Table 8, the indirect path from EFL boredom to EFL achievement via the mediator of behavioral engagement was significant with B = 3.575, SE = .714, 95% CI [-3.172, -.379]. Furthermore, the direct effect of EFL boredom on EFL achievement was also significant with B = -4.094, SE = .974, 95% CI [-6.012, -2.176]. Thus, it could be concluded that behavioral engagement played a partial mediating role between EFL boredom and achievement.

Table 8 Direct and indirect effects of foreign language learning engagement

Model path	Parameter estimate	SE	Bia-corrected CIs (95%)	
			Lower	Upper
Direct effect	-4.094	.974	-6.012	-2.176
Indirect effect: BO→EG→AA	-1.555	.714	-3.172	-.379
Total indirect effect	-5.649	.080	-7.241	-4.056

Note: BO = Foreign language learning boredom; EG = Foreign language learning engagement; AA = Academic Achievement. Bolded CIs considered significant (value do not include zero).

5. Discussion

This study found that EFL boredom could directly affect EFL achievement or indirectly affect EFL achievement through EFL-related behavioral engagement. That is, H_1 and H_2 are supported in a sample of Chinese secondary EFL learners. The finding that EFL boredom was significantly correlated with EFL achievement is consistent with existing studies (Li, 2021; Pekrun et al., 2014; Tze et al., 2016). This finding contributes to the literature by verifying the theoretical hypothesis of the control-value theory of achievement emotions (Pekrun, 2006). The control-value theory postulated that negative achievement emotions (e.g., academic boredom) are negatively correlated with achievement. The present study confirmed the theoretical hypothesis of the control-value theory in a sample of Chinese secondary EFL learners. In addition, the relationships between academic boredom and school outcomes were inconsistent in the existing studies (Hunter et al., 2016; Wang & Xu, 2021). This study clarified the negative relationship between academic boredom and achievement in a sample of Chinese secondary EFL learners.

The finding that behavioral engagement mediated the relationship between academic boredom and achievement could deepen the understanding of the mediating mechanism between academic boredom and achievement. This finding is consistent with the previous studies (Macklem, 2018; Sharp et al., 2020). Drawing upon the control-value theory, serial studies were conducted to investigate the relationships between achievement emotions (e.g., academic boredom) and academic performance (e.g., Hunter & Eastwood, 2021; Shehzad et al., 2021), however, few studies have explored the mediating mechanism between these variables, especially in the EFL learning context in China. The present study found that behavioral engagement mediated academic boredom and achievement, which contributed to the comprehension of the mediating mechanism between the constructs of academic boredom and achievement. To put it another way, behavioral engagement is requested to give play to the predictive effect of academic boredom on EFL achievement.

6. Implications, limitations and future directions

The present study has both theoretical and practical implications. First, academic boredom negatively affected academic achievement, which indicated that educators and policymakers should focus on reducing EFL learners' boredom levels. For example, cultivating a good teacher-student relationship, assigning classroom tasks that are comparable to students' ability levels, and increasing students' appraisals of the classroom tasks are effective ways to reduce students' academic boredom (Clem et al., 2021; Nakamura et al., 2021; Pawlak et al., 2020). Second, behavioral engagement played a partial mediating role between EFL boredom and achievement, suggesting that EFL boredom would affect EFL achievement by acting upon students' behavioral engagement. This finding contributed to the achievement emotions literature by revealing the mechanism by which achievement emotions (i.e., academic boredom) affect academic achievement.

The present study investigated the direct and indirect effects of EFL boredom and achievement in a sample of 235 Chinese secondary school students, contributing to the literature by advancing the understanding of the mediating mechanism between the studied variables. However, three limitations need to be addressed. First, the present study was conducted in a cross-sectional design, and a causal relationship between the studied variables could not be drawn. Future studies are suggested to investigate the causal relationships between academic boredom, behavioral engagement and achievement in a longitudinal design. Second, the present study was based on self-reported data. Although common method bias is ruled out, future studies are suggested to take significant others' (i.e., parents, teachers, and peers) evaluations into consideration to gain a more objective insight into the profiles of the studied variables and the relationships between the studied variables. Third, we solely explored the mediating effect of behavioral engagement between academic boredom and achievement. Future studies are suggested to identify the mediating effects of other variables (e.g., learning strategies and achievement goals) (Daniels et al., 2009; Kang & Wu, 2022) between academic boredom and achievement.

7. Conclusion

This study attempted to investigate the direct and indirect effects of academic boredom on academic achievement in a sample of Chinese secondary EFL students aged 12 to 14. We found that EFL boredom could affect EFL achievement directly or indirectly through behavioral engagement. This study enriched the literature on academic boredom in the field of EFL education. Theoretically, we provided empirical evidence for the hypothesis that negative achievement emotions (e.g., academic boredom) would generate an adverse influence on academic achievement. Furthermore, this study figured out that behavioral engagement is one of the effective paths for academic boredom to act upon academic achievement in the EFL context.

Disclosure statement

All authors declare no conflict of interest.

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