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Teacher support as antecedent of students' academic achievement in EFL learning: Mediating role of academic buoyancy

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Abstract

Teachers' academic support has been empirically shown to positively influence academic performance through both case studies and quantitative research. However, the mechanisms underlying this relationship remain inadequately explored. This gap is particularly evident in the domain of teaching English as a foreign language (EFL), where the integration of positive psychology warrants investigation into how teachers' academic support fosters students' academic buoyancy, subsequently enhancing academic performance. To address this issue, the present study engaged 610 secondary school English learners (292 females, representing 47.5%) in a questionnaire survey. A structural equation modeling analysis was conducted, controlling for variables such as age, gender, and family resources. The findings reveal two key insights: first, both teachers' academic support and academic buoyancy exert significant positive effects on academic performance; second, academic buoyancy serves as a partial mediator between classroom academic support and academic performance. These results underscore the importance of understanding the nuanced roles that teacher support and psychological factors play in educational outcomes. Implications, limitations and direction for further research are discussed.

Keywords: Teacher support; Academic buoyancy; Academic achievement; Mediating mechanism; EFL

1. Introduction

During English language acquisition, Chinese secondary school students inevitably encounter various difficulties and setbacks. During this critical developmental stage, they experience significant psychological and physiological changes associated with puberty, which renders their responses to learning challenges particularly worthy of scholarly attention. Academic buoyancy, defined as an individual student's capacity to navigate academic setbacks and challenges [1], plays a crucial role in this context. It enables students to effectively manage everyday academic stress, exerting a significant positive influence on both learning outcomes and mental health [2]. With the increasing integration of positive psychology into language education, scholars have extensively investigated and validated the positive effects of academic buoyancy on academic outcomes and psychological well-being [3–5]. For example, in a study examining Turkish university students enrolled in English preparatory programs, Aydin and Michou (2020) demonstrated that both motivation and academic buoyancy exert a significant positive influence on academic performance. In another study involving Iranian high school students, Fathi et al. (2024) confirmed that academic buoyancy positively predicts school well-being.

Given the positive effects of academic buoyancy on academic performance and well-being, research has begun to explore the antecedents of academic buoyancy to inform intervention strategies in the educational field. From the perspective of social support theory, scholars have confirmed that school support [3], teacher support [8], and peer support [9] can enhance students' levels of academic buoyancy. Previous studies have separately explored the predictive effects of social support (e.g., teacher academic support) on academic buoyancy, as well as the impact of academic buoyancy on

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academic performance. However, no empirical research has yet connected these three variables to confirm the mediating role of academic buoyancy in the relationship between teacher academic support and academic performance. Furthermore, existing research has largely treated academic buoyancy as a domain-general construct, neglecting its domain-specific characteristics. Accordingly, the purpose of this study is to confirm the mediating effect of academic buoyancy between teacher academic support and academic performance in a sample of Chinese secondary EFL learners.

2. Literature review

2.1. Teacher support

Teachers are pivotal in the educational process and significantly influence students' academic performance. As a fundamental element of the social support system, teacher support encompasses the perceived presence and assistance that students experience within the school environment [10]. Students internally perceive and receive support from teachers. When teachers endorse students' choices and decisions, they provide valuable information, emotional validation, and a reduction in personal stress [11]. An analysis of the concept of teacher support indicates that it embodies the impact of the external environment on student development, while simultaneously emphasizing the importance of students' internal perceptions as social individuals.

Numerous studies have established the considerable impact of teacher support on students' academic performance, personal development, and mental well-being [12–14]. Utilizing data from the PISA 2018 study, Wang and Hu (2022) identified that teacher autonomy support serves as a positive predictor of reading performance, operating through cognitive assessment and the regulation of positive emotions. In another study involving Chinese senior high school students, Li et al. (2023) found that teacher support has a positive predictive effect on academic buoyancy. These existing studies confirm the positive effects of teacher support on academic performance and academic buoyancy, providing empirical evidence for the theoretical model constructed in the present study.

2.2. Academic buoyancy

Although academic buoyancy originates from academic resilience, it differs from academic resilience in that it addresses significant setbacks or long-term academic difficulties. Academic buoyancy refers to the ability to cope with underperformance and recover from minor or infrequent challenges, such as limited interactions with teachers, which are common daily academic adversities [1,16,17]. By comparison, students more commonly encounter academic setbacks, challenges, and difficulties in their daily lives, including high levels of learning stress, declining academic performance, and negative academic evaluations. Therefore, the scope of academic buoyancy is broader than that of academic resilience.

Both the antecedents and consequences of academic buoyancy were broadly explored in existing research [7,18–20]. In these studies, teacher-student relationship quality [21], parental involvement [18], students' self-compassion and benefits of empathy [7], and teacher support [8] were found to be the significant predictors of students' academic buoyancy. On the other hand, the positive impact of academic buoyancy on academic performance [20], learning motivation [22], psychological well-being [2], and academic engagement [3,5] has also been confirmed. Existing research has not yet holistically examined the interplay between teacher support, academic buoyancy, and academic performance, particularly within the specific realm of EFL education. Our study addresses this gap by investigating these relationships among Chinese secondary school students. Specifically, we aim to ascertain whether academic buoyancy serves as a mediating factor between teacher support and academic performance.

2.3. The present study

This study significantly advances the existing literature by addressing the following research questions:

- What are the relationships among teacher support, academic buoyancy, and academic achievement in the EFL context?
- Does academic buoyancy mediate the relationship between teacher support and academic achievement within this context?

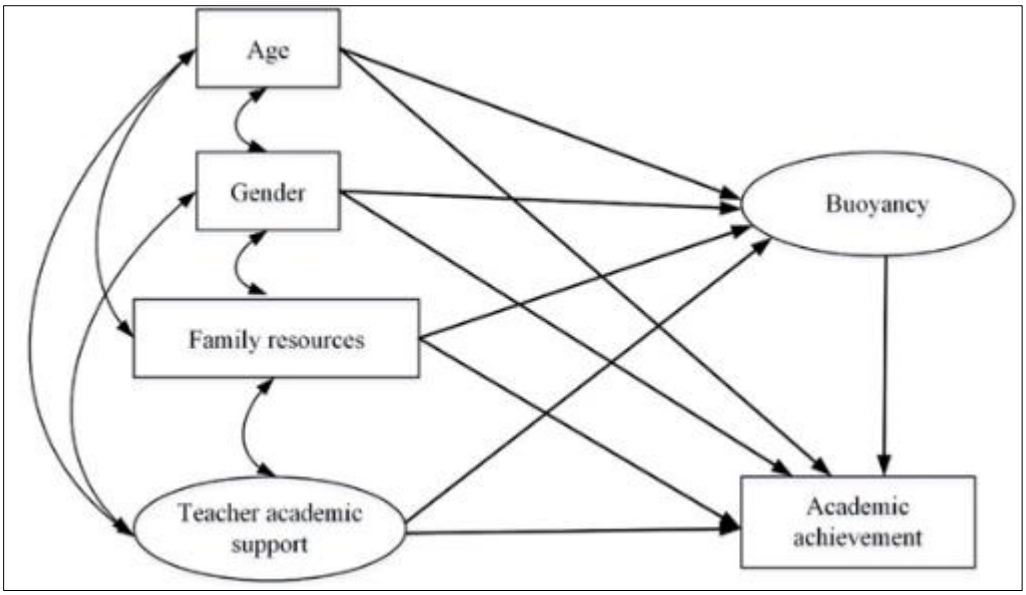


Figure 1 The proposed model

3. Methods

3.1. Participants

The empirical study comprised 610 secondary school students, including 318 males (52.1%) and 292 females (47.9%), thereby reflecting a balanced gender distribution. Participants were aged between 12 and 15 years, with a mean age of 12.97 years (*SD* = 0.76). This age range is particularly significant, as it marks a crucial developmental stage in adolescents' academic and social trajectories. By incorporating a diverse cohort, the research aimed to provide a comprehensive analysis of the interplay between teacher support, academic buoyancy, and academic achievement. The demographic characteristics of the sample establish a robust foundation for investigating the intricate relationships among these variables, yielding insights that may inform effective educational strategies tailored to the distinct needs of male and female students within the EFL context. This balanced methodology enhances the generalizability of the findings to a wider secondary school population, thereby contributing to the broader discourse on educational practices.

3.2. Measures

3.2.1. Teacher support scale

The four items adapted from the Child and Adolescent Social Support Scale [23] were used to measure students' perception of support from their teachers. Recognizing that students may perceive different types of support, reflecting the specificity of their educational context, we adapted items from the original scale to assess perceived support from English teachers. For instance, the item "my teacher cares about how much I learn" from the original scale was adapted to "My English teacher cares about how much I learn". Students responded to each item on a 1 to 5 scale, where 1 indicated "strongly disagree," 3 represented "neutral," and 5 denoted "strongly agree." Higher scores reflect greater endorsement of the items by the students.

3.2.2. Academic buoyancy scale

We measured students' academic buoyancy with the four items adapted from the Academic Buoyancy Scale [1,16]. One example item is "I don't let a bad mark affect my confidence". This scale has been widely used in the previous research and demonstrated excellent psychometric properties [24–26]. In this study, the academic buoyancy scale also demonstrated a good internal consistency with Cronbach alpha equals to 0.82 (see Table).

3.2.3. Academic achievement

Students' foreign language achievement (FLA) was evaluated using their grades in the final examinations. According to Foshan's educational assessment standards, students' grades could range from 0 to 100, with a minimum score of 60 required to pass. For operationalization, FLA was represented by the final English test scores. The comprehensive final semester examination, which took two hours to complete, consisted of multiple sections: Listening (worth 15 points),

Reading Comprehension (20 points), Cloze Test (15 points), Grammar and Vocabulary (25 points), and Writing (25 points). This rigorous assessment ensured a thorough evaluation of students' proficiency in all aspects of the English language.

3.2.4. Covariates

Gender, age, and family resources can influence academic performance or academic buoyancy. For instance, There are gender and age differences in reading achievement [27]. Family and school capital can explain the differences in math and reading achievement across different regions [28], indicating that family resources may also contribute to disparities in academic performance. To better reveal the relationship between teacher support, academic buoyancy, and academic achievement, these three variables were controlled during data analysis.

3.3. Data analysis

Before conducting the main analysis, the issue of common method bias was assessed using Harman's single-factor test [29]. The data analysis was carried out mainly in two steps. First, descriptive statistics were gathered to provide preliminary information. Skewness and kurtosis were examined to ensure suitability for maximum likelihood (ML) estimation. Confirmatory factor analysis (CFA) was then performed to evaluate the properties of the measurement model. Foreign language achievement was subsequently included in the CFA as manifest variables to generate bivariate correlations.

Second, structural equation modeling (SEM) was used to explore the relationships between enjoyment, elaboration strategy, and academic achievement. Additionally, the bootstrap procedure with 5,000 resamples and 95% bias-corrected confidence intervals (CIs) was applied to test for mediation effects. An indirect effect was considered significant if the CIs did not include zero [30].

4. Results

4.1. Common method bias

Harman's single-factor test was applied to evaluate the potential for common method variance in this research [29]. A confirmatory factor analysis (CFA) was performed on all items from the latent variables (i.e., teacher academic support and buoyancy), and the model fit was found to be very poor: $\chi 2(20) = 687.780$, $p < .001$, CFI = .726, TLI = .616, RMSEA = .216, 90% CI [.201, .231], SRMR = .099. These results indicate that common method bias was unlikely to pose a significant issue in the dataset.

4.2. Descriptive statistics

Table 1 presents the descriptive statistics. Following the guidelines from Roever & Phakiti (2017) (|skewness| < 2, |kurtosis| < 2), all variables exhibited adequate normality, allowing for maximum likelihood (ML) estimation. The mean scores show that participants received substantial foreign language teacher academic support (Mean = 4.24/5.00, *SD* = .67) and exhibited a high level of buoyancy (Mean = 3.68/5.00, *SD* = .80) in their EFL classes. As reflected in Table 1, the internal consistency of the latent variables was strong, with Cronbach's α = .82 for both FL teacher academic support and FL buoyancy. In this study, English teacher academic support is the independent variable, student buoyancy in EFL classes serves as the mediator, FL achievement is the dependent variable, and student age, gender, and home educational resources are control variables.

Table 1 Descriptive statistics of the study variables

	Mean	***SD***	**Skewness**	**Kurtosis**	**Cronbach's α**	**Factor loadings**
Teacher support	4.24	0.67	-0.74	0.39	0.82	0.56-0.86
Academic buoyancy	3.68	0.80	0.04	-0.65	0.82	0.55-0.89
Academic achievement	81.63	23.66	-0.71	0.04	-	-

4.3. Measurement models and latent bivariate correlations

An initial measurement model was constructed using four indicators for both FL teacher academic support and FL buoyancy. This confirmatory factor analysis (CFA), along with all subsequent analyses, was conducted using *M*plus 8.3

[32] and evaluated based on several model fit criteria. These included the comparative fit index (CFI), Tucker-Lewis index (TLI), root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR). The model fit for all latent constructs was good, meeting traditional cutoff criteria for excellent and adequate fit: (a) CFI and TLI values of ≥ .95 and ≥ .90, respectively; (b) RMSEA values of ≤ .06 and ≤ .08; and (c) SRMR values of ≤ .08 and ≤ .10 (Chen, 2007; Hu & Bentler, 1999). Based on these criteria, the measurement model demonstrated an excellent fit to the data: $\chi 2(19) = 59.636$, $p < .001$, CFI = .980, TLI = .971, RMSEA = .059, 90% CI [.043, .077], SRMR = .033. Additionally, the standardized factor loadings from the measurement model were satisfactory, ranging from .56 to .89 (see Table 1), all above the recommended threshold of .50 [35].

Table 2 Results of correlations matrix for the study variables

	1	2	3	4	5	6
Teacher academic support	-					
Buoyancy	0.56***	-				
FL achievement	0.32***	0.40***	-			
Age	-0.15***	-0.09*	-0.01	-		
Gender	0.01	-0.05	0.06	-0.04	-	
Home educational resources	0.10*	0.11**	0.20***	0.02	0.01	-

Note. $^{**}p < .01$; $^{***}p < .001$.

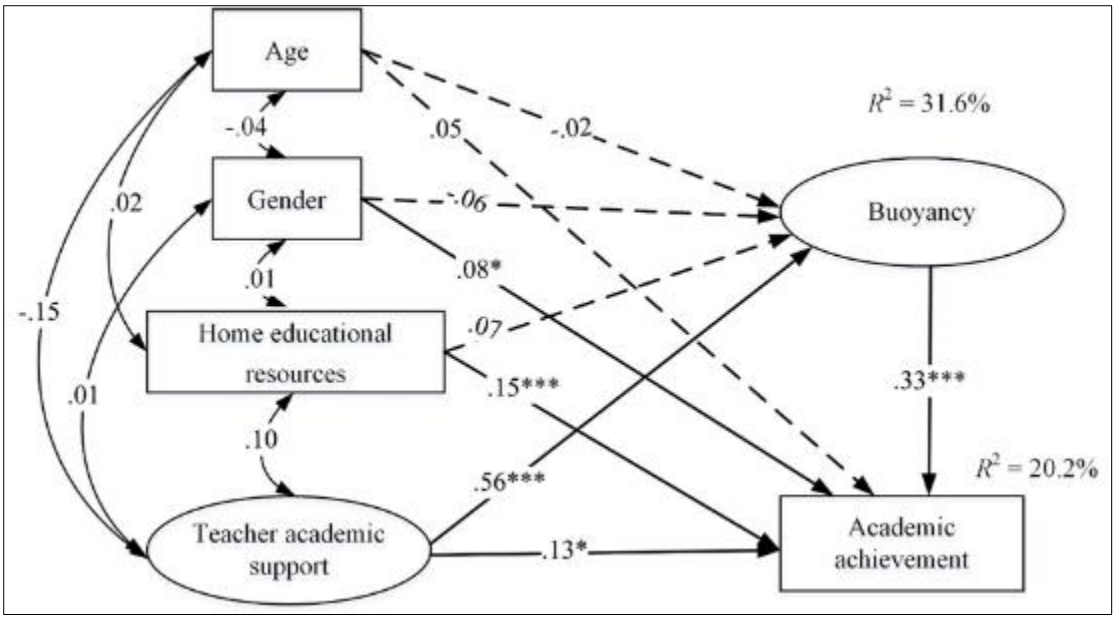
EFL achievement, age, gender, and home educational resources were added to the measurement model as manifest variables, and the model demonstrated a good fit to the data: $\chi 2(43) = 93.193$, $p < .001$, CFI = .977, TLI = .965, RMSEA = .044, 90% CI [.032, .056], SRMR = .029. Latent bivariate correlations from this model are presented in Table 2. Teacher support was positively correlated with both buoyancy and academic achievement, while EFL buoyancy was also positively associated with academic achievement.

4.4. Structural equation modelling

A structural equation modelling was employed to test the proposed model illustrated in Figure 1, incorporating gender, age, and home educational resources as covariates. The model demonstrated a strong fit to the data, with fit indices indicating robust performance: $\chi^2 (46) = 110.591$, $p < .001$, CFI = .971, TLI = .960, RMSEA = .048 (90% CI [.037, .060]), and SRMR = .045. Figure 2 presents the model along with standardized regression weights.

The key findings reveal that: (1) teacher academic support significantly predicted both academic buoyancy ($\beta = .56$, SE = .04, $p < .001$) and achievement ($\beta = .13$, SE = .06, $p < .05$); (2) foreign language buoyancy emerged as a significant predictor of academic achievement ($\beta = .33$, SE = .05, $p < .001$). In terms of the covariates, gender (coded as 0 for male and 1 for female) was positively associated with foreign language achievement ($\beta = .07$, SE = .04, $p < .05$), suggesting that female students outperformed their male counterparts in this area. Furthermore, home educational resources were positively correlated with academic achievement in the foreign language class ($\beta = .15$, SE = .04, $p < .001$). Overall, the proposed model accounted for a substantial portion of the variance in foreign language buoyancy (31.6%) and academic achievement (20.2%).

The mediation effect was assessed using a bootstrap procedure with 5,000 resamples. Mediation was considered significant if the 95% confidence intervals (CIs) did not include zero. As shown in Table 3, the 95% CIs do not cross zero, indicating with 95% confidence that FL buoyancy mediates the relationship between FL teacher academic support and student academic achievement (95% CIs [.12, .25]). Additionally, the direct effect of FL teacher academic support on academic achievement remains significant (95% CIs [.12, .25]), suggesting that FL buoyancy provides partial mediation within the model.



Significance levels: *** p < .001; ** p < .01; * p < .05.

Figure 2 Structural equation model examining the associations between teacher academic support, buoyancy, and academic achievement. For clarity, observed indicators for each variable are omitted from the figure. All correlations and path coefficients are standardized, with non-significant paths indicated by dotted lines

Table 3 Results of mediation analysis

Model path	**Effect**	***SE***	**Bias-corrected CIs 95%**	
			Lower	**Upper**
Total effect	0.31	0.04	0.22	0.39
Indirect effect: TAS → buoyancy → Academic achievement	0.18	0.03	0.12	0.25
Direct effect	0.13	0.06	0.01	0.24

Note. Confidence intervals (CIs) are bolded to indicate significance (values do not include zero). TAS refers to teacher academic support.

5. Discussion

Grounded in social support theory, this study examines the positive influences of teacher support on students' academic buoyancy and academic achievement. Moreover, existing literature has largely overlooked the mediating mechanisms by which teacher support affects academic achievement, often treating academic buoyancy as a domain-general construct while neglecting its domain-specific characteristics. To address this gap, we propose a theoretical model linking "teacher support → academic buoyancy → academic achievement", drawing on established empirical research. The validity of this model is validated through an investigation involving Chinese secondary school students.

First, the support perceived by students from their English teachers is positively correlated with their English grades and academic buoyancy, thereby addressing the first research question. These findings are consistent with existing research [8,36], confirming the positive role of teacher support in enhancing academic achievement and academic buoyancy, while also providing empirical evidence for social support theory. Our findings documented that support from English teachers play a crucial role in enhancing students' ability to main a positive attitude and resilience in the face of academic challenges or setbacks. The possible reasons between these findings might be that teacher support plays a critical role in establishing a safe and dependable environment, thereby encouraging students to engage in academic risk-taking and enhancing their comfort in confronting challenges [37]. Additionally, educators who provide emotional encouragement create an uplifting educational atmosphere that greatly increases student motivation and engagement. When learners feel valued and supported, they are more likely to dedicate themselves to their academic endeavors [38].

Second, academic buoyancy serves as a partial mediator in the relationship between teacher support and academic achievement, elucidating the mediating effect of teacher support on academic outcomes. This finding effectively addresses the second research question. According to social support theory, the positive influence of teacher support on students' academic performance has been established [39,40]. However, the underlying mechanisms that mediate the relationship between these two constructs remain insufficiently understood. This study contributes to existing research by inferring and confirming the mediating effect of academic buoyancy between teacher support and academic achievement, thereby deepening the understanding of intervention studies in the field of foreign language education. Emotional and academic support from teachers plays a crucial role in assisting students in navigating academic setbacks. Such support not only helps students manage immediate challenges but also fosters the development of resilience and problem-solving skills throughout their educational experience [41]. As students enhance their capacity to overcome obstacles, this growth undoubtedly has a positive impact on their overall academic performance. Consequently, the provision of robust support from educators is essential for promoting students' long-term success and well-being in their academic pursuits.

There are both theoretical and practical implications arising from this study. It is essential for educators, in their daily teaching practices, to not only pursue excellence in instructional methods but also to consciously and proactively provide extensive support to their students. This support transcends mere knowledge transfer; it includes emotional and academic guidance that is vital for the holistic development of students. On one hand, the findings of this research contribute to the existing literature by offering empirical evidence from Chinese secondary EFL learners, thereby reinforcing social support theory. This theory asserts that social support, especially from significant figures such as teachers, plays a crucial role in mitigating the negative effects of stressful experiences, including academic setbacks. On the other hand, the identification of academic buoyancy's partial mediating effect between teacher support and academic achievement highlights its importance as a pathway through which teacher support can foster academic success. Academic buoyancy, defined as students' capacity to rebound from academic challenges with optimism and resilience, serves as a critical mediator in the relationship between the support provided by teachers and students' academic outcomes. This insight underscores the necessity of cultivating academic buoyancy among students, as it presents a viable mechanism for enhancing their overall academic performance. Such a focus not only benefits individual learners but also contributes to the broader educational environment by promoting resilience and adaptability in the face of academic challenges.

Despite the positive contributions of this study to the existing literature, there are three shortcomings that need to be acknowledged. First, academic buoyancy plays a partial mediating role between teacher support and academic achievement, indicating that there are other mediating factors present between the two constructs. Therefore, further research could integrate multiple mediating variables (e.g., academic buoyancy, motivation, self-efficacy, and achievement goal orientations) to better explain the mediating mechanisms between teacher support and academic achievement [8,13,36]. Second, this study's mediating model enhances our understanding of the causal relationships among teacher support, academic buoyancy, and academic achievement. However, the cross-sectional design of this research imposes limitations on our ability to fully comprehend these causal dynamics. To gain deeper insights into the interrelationships among these variables, future research should employ a longitudinal approach. Third, this study employed Harman's single factor test to mitigate common method bias. However, all data were derived solely from a student cohort. To enhance the robustness of future research, we recommend expanding data sources to incorporate perspectives from significant others, including parents, teachers, and peers, alongside student data.

6. Conclusion

This study examined the relationships among teacher support, academic buoyancy, and academic achievement among Chinese secondary school EFL learners, controlling for gender, age, and family resources. Two principal findings were identified: First, teacher support was found to positively enhance both academic buoyancy and academic achievement, with academic buoyancy demonstrating a significant positive correlation with academic achievement. Second, academic buoyancy acted as a mediating mechanism between teacher support and academic achievement, suggesting that the positive effects of teacher support on academic success are partially mediated by improvements in students' levels of academic buoyancy. Teacher support in forms of academic feedback or care plays a crucial role in helping students navigate learning difficulties and setbacks, thereby enhancing their overall academic achievement.

Compliance with ethical standard

Acknowledgement

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Statement of ethical approval

The present study was approved by the Human Research Ethics Committee of Foshan University (Reference No.: FUME2023018).

Statement of informed consent

Written informed consent was obtained from all individual participants included in the study and the oral informed consent from participants' parents was also obtained.

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