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Impact of Academic Cultural Adaptation on the Mental Health of Undergraduate Students in Chinese-Foreign Cooperative Education Programs

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Abstract

This study aims to explore the impact of undergraduate students' academic cultural adaptation on their mental health within the Chinese-Foreign Cooperation in Running Schools (CFCRS) programs. The study adopts a quantitative research design. Through a combination of purposive sampling and snowball sampling, 323 valid questionnaires from undergraduate students were collected. The instruments included the Self-Rating Depression Scale (SDS) and a self-developed Academic Cultural Adaptation Scale (ACAS) with six dimensions. Data analysis mainly employed analysis of variance (ANOVA) and structural equation modeling (SEM). It is found that among the six dimensions of academic cultural adaptation, only "academic norms adaptation" and "teacher-student interaction adaptation" could significantly predict mental health levels; while the direct effects of instrumental dimensions such as language, courses, teaching, and assessment were not significant. The study indicates that in cross-cultural education, the possible mechanism for protecting students' mental health is not simply the acquisition of skills, but the internalization of cultural values and the reconfiguration of the power distance between teachers and students. Educational administrators should provide experiential training on academic ethics for new students and offer Chinese culture training for foreign teachers to build an equal and inclusive teacher-student interaction support network.

Key words: *Academic cultural adaptation, mental health, undergraduate students, Chinese-Foreign Cooperation in Running Schools (CFCRS) programs*

Introduction

Transnational Higher Education (TNHE) serves as the primary driving force for the internationalization of higher education worldwide and is expanding rapidly across the globe. In the context of China's higher education, TNHE is commonly referred to as Chinese-Foreign Cooperation in Running Schools (CFCRS) (Hou et al., 2014). It is not only an important part of TNHE's global development (Huang, 2007), consisting of two forms: CFCRS institutions and programs (Yang, 2014), but also a key approach to achieving the internationalization of Chinese universities (Huang, 2007). By the end of 2021, the number of CFCRS institutions and programs registered in China had reached 2,447, with cooperation partners covering over 1,000 higher education institutions (HEIs) in 39 countries and regions across the globe, making it an important component of the international education landscape in China and even globally (Liu & Ling, 2025).

CFCRS programs (alternatively referred to as "transnational programs") are an educational model established by domestic Chinese universities in collaboration with overseas universities. The aim is to achieve internationalization at home (IaH) and specifically cultivate Chinese domestic students (Hou et al., 2014). In these programs, the pedagogical environment exhibits a high degree of cross-cultural convergence. The teaching team consists of lecturers from both the foreign and domestic institutions. The teaching content not only covers language learning but also extensively uses foreign language as the medium of instruction for professional knowledge; at the same time, core educational resources such as teaching syllabi, teaching techniques, textbooks, and course systems are all introduced from the foreign partner universities (Zhao & Hu, 2020). This model also breaks the traditional Chinese assessment system and introduces diversified assessment methods from the foreign partners (such as highly relying on group discussions, classroom presentations, role-playing, and simulations), making the original assessment standard based on a single final exam more complex and diverse (Zhao & Hu, 2020).

Although TNHE provides students with convenient international education, it also triggers deep-seated academic and cultural conflicts. Most Chinese students, after receiving 12 years of highly structured and exam-oriented local education, directly

enter the dual teaching model of CFCRS. They not only have to adapt to the transition from high school to higher education, but also must cope with the intense impact of the Western teaching paradigm in a cross-cultural context. This deep-seated academic cultural adaptation poses significant challenges to the students' cognitive abilities, cross-cultural communication, and self-adjustment levels. In the international academic community, the cross-cultural adaptation and mental health issues of international students have received widespread attention (e.g. Chen et al., 2018; Lee et al., 2004; Minutillo et al., 2020). However, in the IaH context, the mental health status of students in TNHE is often overlooked. In fact, when students encounter academic and cultural conflicts in their native land, the subjective pressure and discomfort they generate will directly affect their mental health. An in-depth exploration of the influence mechanism between academic cultural adaptation and mental health is not only the key to implementing the "student-centered" educational philosophy, but also has important values for the high-quality and sustainable development of global TNHE.

Driven by the practical difficulties faced by CFCRS undergraduate students during their academic cultural adaptation, this study employs a quantitative method to systematically investigate the current state of their adaptation and mental health, further examining the intrinsic relationship between the two. Specifically, this research seeks to uncover the specific challenges and authentic needs encountered by Chinese undergraduate students in cross-cultural academic environments. Doing so not only helps bridge the gap in mental health research concerning IaH students—thereby drawing the global higher education community's attention to this rapidly expanding demographic—but also provides empirical evidence for program administrators, policymakers, and educators from diverse cultural backgrounds. Ultimately, these insights can be utilized to optimize pedagogical interventions, thereby promoting the mental well-being and holistic development of students in TNHE.

Literature Review

Cross-cultural adaptation is a significant challenge faced by students in CFCRS programs, directly affecting their academic performance and mental health. According to Berry (2002), cross-cultural adaptation

refers to the relatively stable outcome achieved by an individual during the process of integrating into a new cultural environment, and is typically divided into two core dimensions: psychological adaptation and sociocultural adaptation (Ward & Rana-Deuba, 1999).

Current research indicates that cross-cultural adaptation for CFCRS students is complex and multifaceted. At the psychological level, 19.6% to 26.5% of students show mild depressive symptoms, and the degree of depression is significantly positively correlated with the severity of cross-cultural adaptation disorders (Tan & Tao, 2014). At the sociocultural level, academic adaptation issues are particularly prominent, manifested as insufficient understanding of institutional regulations and low classroom participation (Tan & Tao, 2014). Zou et al. (2023) further pointed out that academic adaptation predicaments stem from East-West educational differences, forcing students to cope with the dual transformation of the assessment system "from result-oriented to process-oriented" and the learning mode "from passive acceptance to active exploration". Focusing on the bilingual teaching environment, Chen and Ren (2010) proposed that students usually experience four stages in cross-cultural classrooms: "excitement - shock - relief - integration".

The factors influencing students' cross-cultural adaptation can be classified into three macro levels: individual, educational, and cultural. At the individual level, demographic variables such as gender, age, and length of study abroad play varying degrees of roles (Zhou et al., 2016; Tan & Tao, 2014). At the educational level, the quality of teaching and students' satisfaction during the domestic training stage serve as core predictive indicators; Zou et al. (2023) argue that the underlying cause of educational transition disorders is essentially a conflict between behaviorism and constructivism. At the cultural level, the mismatch in teacher-student power distance constitutes a major obstacle to integration: the "authoritative" teacher-student relationship prevalent in Chinese culture contrasts sharply with the "guiding" relationship emphasized in Western culture, creating a significant gap in expectations (Zou et al., 2023).

Multiple studies have shown that CFCRS students exhibit higher risks of mental health problems compared to students in regular programs (Wang et al., 2010; Wan & Ye, 2009; Ma et al., 2018). Regarding the

causes of mental health issues, Wu and Du (2017) pointed out that differences in values, customs, and academic norms between China and foreign countries trigger significant cultural conflicts, and the "dual-campus" training model intensifies these challenges. Tan (2013) further emphasized that cross-cultural adaptation involves the reconstruction of self-awareness and cultural identity, imposing heavy psychological burdens. Du's (2018) research found that the foreign education system's emphasis on autonomous learning and critical thinking requires students to reconstruct their learning strategies, and the frustration experienced during this process is likely to turn into psychological pressure. In terms of individual factors, Li (2023) and Fang (2011) confirmed that learning engagement, coping strategies, and demographic variables (e.g., grade, only-child status) jointly influence students' mental health.

Despite extensive research, significant gaps remain. First, previous studies have paid insufficient attention to "academic cultural adaptation" as an independent construct, rarely examining its specific relationship with mental health. Second, most studies remain at descriptive analysis, lacking in-depth exploration of the mechanisms through which academic cultural adaptation affects mental health.

In view of this, the present study makes two contributions. Theoretically, it separates "academic cultural adaptation" from the broad concept of "cross-cultural adaptation" and proposes six quantifiable dimensions: courses, teaching methods, academic norms, assessment system, language ability, and teacher-student interaction. Empirically, it reveals the direct impact of different dimensions of academic cultural adaptation on students' mental health, addressing a topic rarely examined in existing research.

Research hypotheses

This study explores the impact of undergraduate students' academic cultural adaptation in CFCRS programs on their mental health. Prior research has shown that cross-cultural adaptation is a process that combines psychological adaptation and social adaptation, and the two promote and influence each other. Zhong et al. (2013) point out that the psychological condition of international students is closely related to their degree of cultural adaptation; the greater the difficulty for individuals to accept different cultures, the more prominent their

psychological problems will be (Zhong et al., 2013). Similarly, Tan and Tao (2014) also indicate that there is a significant positive correlation between the various dimensions of psychological adaptation and social and cultural adaptation.

For CFCRS program learners, although they are studying in China, they still need to confront challenges such as non-native academic standards, different ideas and concepts, and language barriers. If students can smoothly adapt to this different academic culture in terms of cognition, behavior and emotions, their self-efficacy will increase. This will effectively reduce the anxiety and loneliness caused by "cultural disconnection", thereby helping to improve their mental health. On the contrary, poor academic cultural adaptation may become a source of stress, which in turn may trigger a series of psychological problems. Therefore, this study proposes Hypothesis H1 and its sub-hypotheses:

H1: The six dimensions of undergraduates' academic cultural adaptation significantly and positively predict their mental health.

H1a: Undergraduates' adaptation to course design and workload significantly and positively predicts their mental health.

H1b: Undergraduates' level of adaptation to foreign teaching philosophies significantly and positively predicts their mental health.

H1c: Undergraduates' adaptation to academic integrity norms significantly and positively predicts their mental health.

H1d: Undergraduates' adaptation to different assessment methods significantly and positively predicts their mental health.

H1e: Undergraduates' English academic communication competence significantly and positively predicts their mental health.

H1f: The depth of undergraduates' interaction with international faculty significantly and positively predicts their mental health.

The individual adaptation process is typically dynamic and time-dependent. Zhu (2011) points out that younger international students (under 22 years old) encounter more problems in academic and psychological adaptation compared to older students (Zhu, 2011). Meanwhile, Wen et al. (2014) find that the longer international students stay in China, the

fewer cross-cultural adaptation obstacles they encounter. From the perspective of personal development, Gaither and Griffin (1971) believe that older students usually have better self-regulation abilities and stronger professional foundations, thus performing better in adaptation (Gaither & Griffin, 1971). For students in CFCRS programs, as their grade increases, their understanding of Western academic paradigms gradually deepens, and their academic resilience and coping strategies also become increasingly mature. Fresh students who first contact with the program may experience a more severe "academic culture shock"; however, senior students, after a period of study, will become calmer both psychologically and academically. Therefore, this study proposes Hypothesis H2:

H2: There are significant differences in academic cultural adaptation and mental health levels among undergraduate students from different grades.

Different educational models (such as "4+0", "2+2", etc.) represent the differences in the duration of international education that students receive during their undergraduate studies, which leads to varying degrees of exposure to foreign education. Such model differences also pose different requirements for individual adaptability. Tan and Tao find that the duration of studying abroad has a significant impact on students' psychological adaptation; students who study abroad for a longer period (two years or more) have better psychological adaptation (Tan & Tao, 2014). Moreover, even short-term study abroad or study tours are a form of "cross-cultural communication", which enables students to receive training in emotions, cognition, and behavior. Pan and Yang (2021) believe that overseas study helps improve the cross-cultural communication skills of Chinese students. This "going abroad" experience can break students' original conceptions and enable them to better understand and cope with cultural differences. Based on this, this study proposes hypotheses H3 and H4:

H3: There are significant differences in academic cultural adaptation and mental health levels among undergraduate students participating in different models of CFCRS programs.

H4: There are significant differences in academic cultural adaptation and mental health levels between undergraduate students who have had overseas study or study-abroad experiences and those who have not.

This study will systematically verify the above hypotheses through questionnaire surveys and quantitative analysis methods.

Method

Data collection

Data were collected using a combination of purposive and snowball sampling to ensure sample relevance and diversity. This research strictly adheres to relevant ethical norms. The research plan and questionnaire design were submitted and successfully approved by the ethics review committee of our university before the survey. Considering that this research is a non-invasive questionnaire survey with minimal risks, the research adopted the verbal informed consent. Prior to data collection, the authors informed potential respondents of the purpose of the research, the voluntary nature of participation, their right to withdraw at any time, as well as the strict measures taken to ensure data anonymity and confidentiality. Participants completed the questionnaire only after providing explicit verbal consent. Initially, students from CFCRS programs at the researchers' university were recruited via campus forums and mainstream social media platforms (e.g., WeChat, QQ). To expand the sample size, a snowball sampling strategy was employed wherein class monitors distributed the online survey within their respective cohorts. Simultaneously, offline recruitment was conducted using QR codes in classrooms. To overcome the limitations of a single-institution sample, recruitment was further extended to similar programs at other universities via cross-institutional alumni networks, thereby increasing sample heterogeneity.

Measures

The questionnaire comprised three sections: demographic information, a mental health assessment, and a self-developed Academic Cultural Adaptation Scale (ACAS). The demographic section collected baseline data (e.g., gender, grade, major) alongside program-specific contextual variables (e.g., program model, prior overseas experience). In this study, mental health was operationalized through depressive symptoms measured by the Self-Rating Depression Scale (SDS), a widely validated 20-item tool measuring depressive symptoms. Items were rated on a 4-point Likert scale, including 10 reverse-scored items. Standard scores (raw score × 1.25) were utilized for assessment, with higher scores indicating greater depression severity. Based on standard clinical cutoffs, scores were categorized as normal (< 53),

mild depression (53 – 62), moderate depression (63 – 72), and severe depression (⩾ 73).

To ensure measurement reliability and validity, the ACAS was developed following rigorous psychometric procedures. Initially, online interviews with five students from CFCRS programs were conducted to gain qualitative insights into their academic experiences (e.g., curricula, teaching methods of foreign instructors). Based on the interview data and existing literature, a preliminary 7-dimension scale was drafted, including curriculum, teaching, academic norms, assessment, language, teacher-student interaction, and peer collaboration. A subsequent pilot study (N = 40) demonstrated strong overall reliability (Cronbach's α = 0.916). However, the "peer collaboration" dimension was removed due to low internal consistency (α = 0.514) and conceptual misalignment with the remaining institution- and teacher-directed dimensions. To optimize measurement reliability, items in the retained six dimensions were refined and expanded from three to four or five items per dimension, culminating in a finalized 30-item scale ready for the main study.

The ACAS, developed specifically for CFCRS contexts, consists of 30 items across six dimensions: curriculum, teaching, academic norms, assessment systems, language, and teacher-student interactions. Notably, "academic norms" was treated as an independent dimension to assess students' internalization of academic integrity and citation ethics. Items were scored on a 5-point Likert scale, with higher total scores reflecting better adaptation. For descriptive purposes, overall adaptation levels were categorized into five tiers (from low to high adaptation) based on the mean and standard deviation.

Data Analysis

Data analyses were conducted using SPSS 29.0 and Amos 26.0. SPSS was utilized for descriptive statistics, analyses of variance (ANOVA) to examine group differences, internal consistency reliability tests, and Exploratory Factor Analysis (EFA). Amos was employed for Confirmatory Factor Analysis (CFA) to validate construct validity and Structural Equation Modeling (SEM) to test the hypothesized pathways.

Results

Reliability and Validity

For mental health measurement, the SDS demonstrated very high internal consistency with a Cronbach's α of 0.975. Validity tests yielded a Kaiser-Meyer-Olkin

(KMO) value of 0.984 and a significant Bartlett's test of sphericity ($p < 0.001$), indicating that the data were suitable for factor analysis.

Dimension	Cronbach's α	No. of items
Curriculum	0.886	5
Teaching	0.881	5
Academic norms	0.901	5
Assessment	0.886	5
Language	0.888	5
Teacher-student interaction	0.860	4
Total	0.934	30

The self-developed ACAS also exhibited high internal consistency, with a total Cronbach's α of 0.934 and sub-dimension α values all exceeding 0.80 (Table 1). Exploratory Factor Analysis (EFA) confirmed the scale's suitability for factor extraction (KMO = 0.927, Bartlett's test $p < 0.001$). Using Principal Component Analysis (PCA) with Varimax rotation, six factors with eigenvalues greater than 1 were extracted, cumulatively explaining 70.01% of the total variance. The factor loadings for all items were satisfactory, with no significant cross-loadings observed. The six extracted factors aligned well with the predefined dimensions of the questionnaire, thereby providing robust support for the six-dimensional theoretical structure of the scale.

Table 1

Reliability Coefficients of ACAS

CFA further validated the model, demonstrating excellent fit indices (CMIN/DF = 1.095, RMSEA = 0.017, GFI = 0.924). Regarding convergent validity, all standardized factor loadings exceeded 0.70, Average Variance Extracted (AVE) values were > 0.50, and Composite Reliability (CR) values were > 0.80. Discriminant validity was also established, as the square roots of the AVEs for each construct were greater than their respective inter-construct correlations (Table 2).

Table 2

Correlations among ACAS Dimensions and Discriminant Validity

	Curriculum adaptation	Teaching adaptation	Academic norms adaptation	Assessment adaptation	Language adaptation
Curriculum adaptation					
Teaching adaptation	0.472***				
Academic norms adaptation	0.488***	0.450***			
Assessment adaptation	0.444***	0.463***	0.512***		
Language adaptation	0.456***	0.383***	0.546***	0.492***	
Teacher-student interaction adaptation	0.414***	0.396***	0.379***	0.472***	0.438***
Square root of AVE	0.781	0.773	0.804	0.781	0.784

***P<0.001

Descriptive Statistics

A total of 323 valid questionnaires were collected (effective response rate: 82.19%). The sample was demographically diversified regarding gender, grade, major, and program models (Table 3). Gender distribution was relatively balanced (149 males, 174 females). The cohort spanned all undergraduate years, with juniors constituting the largest proportion (28.8%). Furthermore, 22.9% of the participants reported having over one month of prior overseas exchange experience, providing a comparative basis for evaluating the spillover effects of cross-cultural experiences.

Table 3.

Overall Status of the Sample

		No.	%
Gender	Male	149	46.1
	Female	174	53.9
Year of study	1st year	64	19.8
	2nd year	81	25.1
	3rd year	93	28.8
	4th year	85	26.3
Education model	"4+0"*	270	83.6
	"3+1"*	28	8.7
	"3+2"*	3	0.9
	"2+2"*	22	6.8
Overseas experience	Yes	74	22.9
	No	249	77.1

*Note: *The number before "+" represents the duration of the student's study in China, and the number after "+" represents the duration of the student's study at the foreign partner university. For example, "4+0" means the students spend the whole four years studying in the Chinese university, no time spent in the foreign partner university.*

Regarding mental health, the mean SDS standard score was 53.89, slightly above the clinical cutoff (53). Specifically, 145 students reported no depression, whereas 178 exhibited varying degrees of depressive symptoms (70 mild, 60 moderate, 48 severe). Item-level analysis indicated that students primarily suffered from general emotional distress and academic stress rather than severe somatic symptoms (e.g., weight loss) or extreme psychiatric dysfunction.

In terms of academic cultural adaptation, the item means ranged from 3.0 to 4.0, indicating an above-average overall level of academic cultural adaptation among the participants. However, the standard deviations for all items exceeded 1.0, demonstrating substantial individual heterogeneity in adaptation capabilities. A cross-dimensional analysis further revealed an uneven developmental pattern across dimensions: the language adaptation dimension yielded the lowest mean score, underscoring that language barriers remain a primary difficulty in students' cross-cultural academic communication. Additionally, the

academic norms dimension exhibited the largest standard deviation, indicating that participants demonstrated the greatest variance in internalizing and adhering to academic ethics, citation conventions, and academic integrity. Furthermore, a stratification based on the mean (M = 101.22) and standard deviation (SD = 20.32) of the total academic cultural adaptation score revealed a distinct polarization trend within the sample, characterized by the coexistence of a low-to-moderate adaptation group (n = 129) and a moderate-to-high adaptation group (n = 79) (as illustrated in Figure 1).

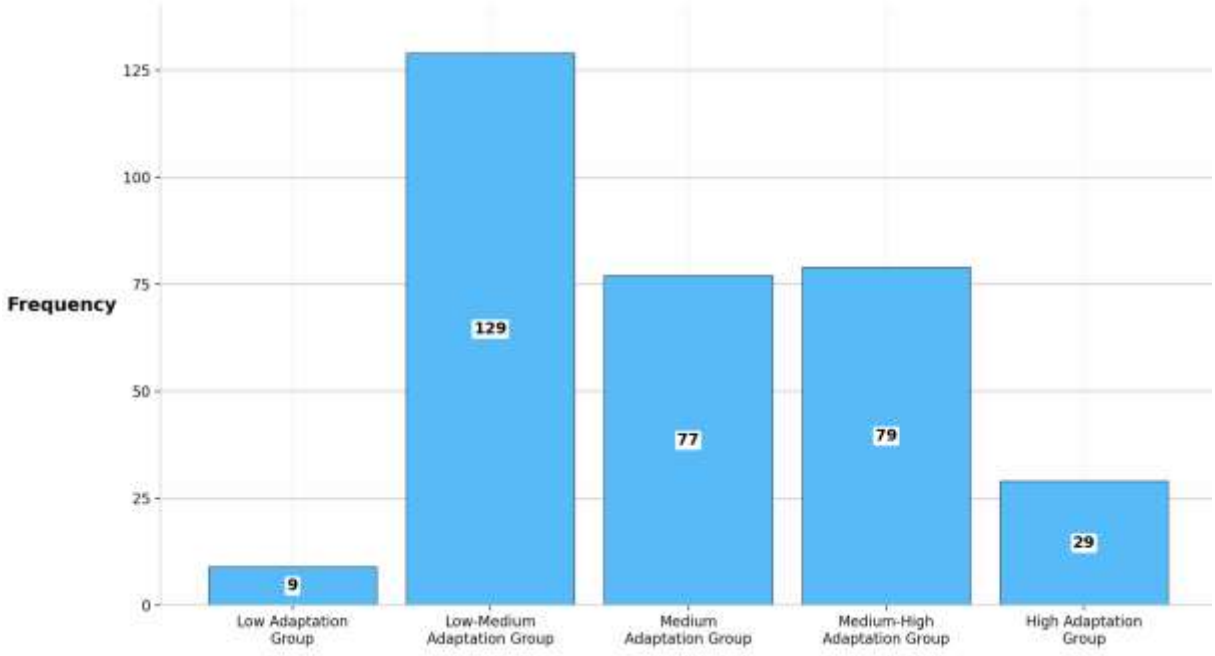

Figure 1. Distribution of Academic Cultural Adaptation Levels by Number of Participants

Analysis of Variance (ANOVA)

Prior to conducting inferential analyses, the normality of the data distribution was assessed. Although the results indicated a significant deviation from strict normality ($p < .001$), given the adequate valid sample size ($N = 323$), the sampling distribution of the means is considered approximately normal according to the Central Limit Theorem. Consequently, the application of parametric tests to examine between-group differences is appropriate and robust. In examining differences in mental health status, an initial one-way analysis of variance (ANOVA) with grade level as the independent variable—having met the assumption of homogeneity of variances ($p > .05$)—revealed a

statistically significant difference across grade levels ($p < .001$). An overall trend of improvement was observed as grade level advanced, with first-year students exhibiting a significantly higher risk of depression compared to their peers. However, to rule out the confounding effects of extraneous variables, "program model" was further incorporated into a two-way ANOVA model. The results demonstrated that after controlling for the confounding effects of the program model, the main effect of grade level on mental health attenuated to non-significance ($p = .073$). Furthermore, neither the main effect of the program model ($p = .843$) nor the interaction effect between the program model and grade level ($p = .746$) reached statistical significance. Additionally, an independent-samples t-test indicated that a short-term overseas exchange experience did not yield significant group differences in mental health outcomes ($t = -1.659, p = .098$). Synthesizing these analyses, the initially observed grade-level differences were, in fact, an artifact confounded by factors such as the program model. Once these confounding variables were isolated, neither grade level, program model, nor overseas experience emerged as valid, independent predictors of mental health outcomes among students in CFCRS programs.

In contrast to the mental health outcomes, students' academic cultural adaptation exhibited significant variations across different grade levels. A one-way analysis of variance (ANOVA) indicated a significant main effect of grade level across all six sub-dimensions of academic cultural adaptation ($p<.05$), revealing an overall upward trajectory in adaptation levels as students progressed through their academic years. Specifically, within the dimension of curriculum and instructional adaptation, first-year students scored significantly lower than their upper-class counterparts. This objectively reflects the transitional struggles and adjustment pressures freshmen experience when shifting from a traditional educational model to an internationalized pedagogical paradigm. Regarding the academic norms and assessment dimension, the data demonstrated a distinct "seniority advantage." Fourth-year students significantly outperformed the other three cohorts, whereas no significant differences were detected among the first-, second-, and third-year groups. This suggests that the internalization of academic integrity and the mastery of diversified assessment

systems are not achieved overnight, but rather necessitate a prolonged process of accumulation. Furthermore, a prominent tiered pattern emerged in the dimensions of language adaptation and teacher-student interaction: third- and fourth-year students exhibited significantly higher language application proficiency and interaction efficacy with foreign faculty compared to underclassmen. This confirms that foreign language proficiency and cross-cultural social confidence undergo a substantial leap during the mid-to-late stages of undergraduate studies.

To corroborate the robustness of the aforementioned developmental trends, a two-way ANOVA was conducted utilizing the total academic cultural adaptation score as the dependent variable. The results indicated that, even after controlling for the influence of the program model, the main effect of grade level on overall academic cultural adaptation remained statistically significant ($p=.006$). Conversely, neither the main effect of the program model ($p=.177$) nor the interaction effect between the two variables ($p=.138$) reached statistical significance. Post-hoc multiple comparisons further substantiated that fourth-year students exhibited the optimal level of overall academic cultural adaptation, followed by third-year students, whereas the first- and second-year cohorts functioned at a relatively lower adaptation baseline. This finding is highly congruent with the conclusions drawn from the one-way ANOVA, indicating that accumulated campus experience and duration of enrollment are the core drivers of academic cultural adaptation. Furthermore, the structural discrepancies between full-time domestic enrollment and split-site transnational models did not exert a decisive impact on the academic cultural adaptation challenges faced by students. Finally, independent-samples t-tests regarding overseas experience similarly failed to reveal any significant between-group differences across all measures (all $ps>.05$). This finding suggests that within the context of highly developed "Internationalization at Home" (IaH) in CFCRS programs, the cross-cultural immersive environment of the home campus is already sufficient to effectively fulfill students' academic cultural adaptation needs. Consequently, this partially negates the traditional comparative advantages typically associated with short-term study abroad or exchange experiences in fostering academic cultural adaptation.

Structural Equation Modeling (SEM)

Building upon the robust construct validity established by the preceding confirmatory factor analysis (CFA), this study constructed a structural equation model (SEM) to examine the predictive effect of academic cultural adaptation on mental health. Statistical results indicated that the overall goodness-of-fit indices for the model generally met the established statistical criteria. Specifically, the ratio of chi-square to degrees of freedom (χ^2/df) was 1.192, well below the empirical threshold of 3.0. The Root Mean Square Error of Approximation (RMSEA) was .024, satisfying the stringent criterion of < .05. Additionally, the Incremental Fit Index (IFI) and the Tucker-Lewis Index (TLI) were .982 and .981, respectively, both substantially exceeding the .90 benchmark. Furthermore, although the Goodness-of-Fit Index (GFI = .862), the Normed Fit Index (NFI = .899), and the Relative Fit Index (RFI = .893) fell slightly below the traditional cutoff value of .90, these indices remain well within a fully acceptable range, given the broader tolerance criteria recognized in the literature for complex structural models. Taken together, the hypothesized theoretical path model demonstrated a robust empirical fit with the observed data, thereby providing a solid statistical foundation for further delineating the predictive relationships among the variables.

When examining the specific path effects (Figure 2), it is first necessary to clarify the scoring rules of the scale and the rationale for interpreting the path coefficients. In this study, the SDS was employed to assess mental health status; higher scores on this scale indicate a greater tendency toward depression and, consequently, a lower level of mental health. Accordingly, a negative standardized path coefficient in the model signifies that the independent variable exerts a protective and positive enhancing effect on mental health. The results of the standardized path analysis revealed that both "adaptation to academic norms" (β = -0.174, p = 0.015) and "adaptation to teacher-student interaction" (β = -0.182, p = 0.012) significantly and negatively predicted SDS depression scores. Based on the scoring rationale of the SDS, it can be further inferred that these two adaptation dimensions have a significant positive predictive effect on individuals' mental health. This indicates that the more thoroughly students internalize and adhere to academic norms, and the more effective

their interactions with foreign faculty members, the lower their perceived psychological stress and risk of depression, thereby reflecting a more optimal state of mental health. In contrast, the direct predictive effects of the remaining four dimensions—namely, curriculum adaptation, instructional adaptation, assessment adaptation, and language adaptation—on mental health outcomes did not reach statistical significance (all p>.05). Synthesizing these path relationships, it can be concluded that within the specific and challenging cross-cultural milieu of CFCRS programs, the proficient mastery of academic ethical norms and the establishment of high-quality teacher-student interaction networks constitute core academic protective factors. These factors effectively buffer psychological stress and safeguard students' mental well-being.

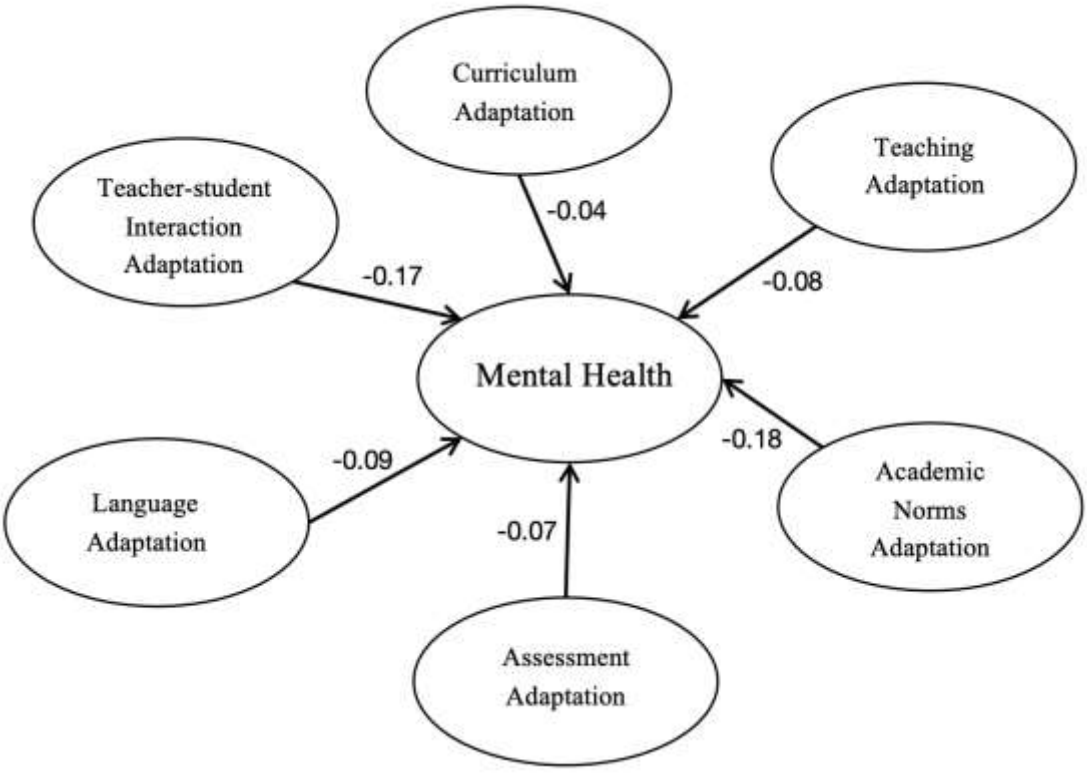

Figure 2. Impact of Academic and Cultural Adaptation on Mental Health

Discussion

According to the results, H1 was partially supported. Specifically, H1c and H1f were supported, whereas H1a, H1b, H1d, and H1e were not supported. H2 was partially supported because grade differences were significant for academic cultural adaptation but not robust for mental health after

controlling for program model. H3 and H4 were not supported.

The most notable finding of this study is that, among the six dimensions comprising academic cultural adaptation, adaptation to academic norms and teacher-student interaction have become two significant and independent protective factors for predicting students' mental health, while the influence of dimensions such as courses, teaching, assessment, and language was insignificant. This result suggests that in CFCRS programs, it is not merely "academic difficulty" that affects students' mental well-being, but rather whether students can gain a clear understanding of academic rules and secure reliable social support. This finding challenges the traditional view that language barriers are the main cause of psychological distress among students in transnational programs. This seemingly counterintuitive result reveals the underlying mechanisms of psychological adaptation within cross-cultural education.

First, adaptation to academic norms involves not only understanding "what is right and wrong" but also decoding and internalizing the deeper cultural values that explain "why." Compared with the explicit and institutionalized academic integrity training commonly emphasized in many foreign-partner universities, some Chinese students may have had less systematic exposure to citation conventions, plagiarism policies, and academic misconduct procedures before entering CFCRS programs. When students abruptly transition from one academic ethical system to another, the anxiety they experience is not due to a lack of skills, but rather a destabilization in cultural identity and a temporary confusion regarding moral standards. Therefore, the adaptation to academic norms is indicative of an individual's "reconstruction" at the cultural value level. Successfully navigating this adaptation process greatly reduces the cognitive dissonance and deep-seated insecurity caused by cultural value conflicts, thereby exerting a direct positive protective effect on mental health. This aligns with Berry's (2002) acculturation theory, which posits that the successful implementation of integration strategies is key to alleviating acculturative stress.

Second, the importance of adapting to teacher-student interactions is that it directly addresses the core conflict between China's "high power distance" educational culture and the Western "low

power distance" approach. In the traditional Chinese educational system, teachers act as authoritative knowledge transmitters, and the teacher-student relationship is strictly hierarchical. In contrast, the Western teaching model regards teachers as guides and collaborators, encouraging equal dialogue and the questioning of authority. For Chinese students, actively initiating discussions with foreign instructors and presenting alternative viewpoints represent not only a behavioral shift but also a psychological breakthrough in challenging established "authority." Furthermore, these interactions serve a vital socio-emotional support function. Positive engagement with faculty can help students build a sense of belonging and social capital in a heterogeneous cultural environment, effectively buffering against the loneliness and helplessness caused by academic pressure. Conversely, if adaptation in this dimension is poor, students may become stranded on a "cultural island"—alienated by the expectations of foreign teachers while feeling cut off from their familiar support networks, thereby exacerbating their psychological exhaustion.

Somewhat counterintuitively, adaptation to language, coursework, teaching, and assessment did not emerge as direct, significant predictors of mental health in this study's model. The possible underlying reasons are as follows: First, these four dimensions represent "explicit instrumental challenges." Before choosing CFCRS programs, students usually already possess well-formed "psychological expectations" regarding all-English instruction, Western curriculum structures, and diverse assessment methods. These anticipated difficulties are generally perceived as a "normative academic burden." While they may induce short-term fatigue or stress, they are insufficient to directly trigger profound psychological distress. Ultimately, these four non-significant dimensions primarily concern "skill acquisition." In contrast, the significant dimensions (academic norms and teacher-student interactions) directly touch upon students' values, identities, and social belonging—factors that exert a far more profound impact on mental well-being.

Second, having navigated 12 years of highly structured and intense exam-oriented education, Chinese students generally develop a remarkable degree of "academic

resilience." When facing heavy course loads, unfamiliar pedagogies, or complex assessment tasks, they tend to view these challenges as hurdles that can be overcome through increased time investment and sheer diligence. The task-focused coping strategies cultivated in the domestic education system effectively buffer the direct negative impacts of instrumental academic obstacles on mental health.

Third, when grappling with language barriers, course comprehension issues, or complex assessment mechanisms (such as group presentations and project reports), students often spontaneously form tight-knit peer learning communities. This frequent collaboration and information sharing acts as a powerful social support network. Such horizontal support among peers effectively diffuses individual anxiety in the face of pedagogical and evaluative shifts, thereby interrupting the pathway from routine academic difficulties to clinical depression.

Finally, from a statistical and mechanistic perspective, poor adaptation in these four areas may not directly lead to depression, but rather function as distal variables. They may first cause diminished academic self-efficacy or poor academic performance, which in turn indirectly affect mental health. In the structural equation model of this study, when directly examining their paths to mental health, their main effects may have been masked or absorbed by the stronger explanatory power of interpersonal variables (such as teacher-student interactions).

The analysis revealed that the main effect of grade on academic cultural adaptation remained significant after controlling for the educational model, reflecting a "cumulative academic socialization" process: students continuously engage in trial and error, and calibrate in cross-cultural classrooms, gradually internalizing foreign academic norms and modes of interaction into their daily learning strategies. However, neither the educational model nor short-term overseas experience yielded significant variations in academic cultural adaptation and mental health. This might be related to the binary (yes/no) measurement of overseas experience, which likely diluted the true effect. More importantly, it highlights the profound influence of Internationalization at Home (IaH). When domestic phases already feature intensive international courses, foreign teacher interactions, and diverse assessments, the

marginal returns brought by studying abroad have significantly diminished. The key to adaptation now shifts to the sustained quality of cross-cultural contact in the daily classroom; domestic campuses have successfully created a highly immersive and rigorous transnational academic environment, ensuring that regardless of whether students go abroad, the cultural shock they experience is almost equally intense.

Nonetheless, this immersion also induces "invisible cultural shocks": unlike the psychological "honeymoon period" experienced by traditional international students after geographical migration (Chen & Ren, 2010), students in CFCRS programs need to transition abruptly from the exam-oriented high school system in their home country to the Western academic model, without the benefit of transitional time buffers. Moreover, the educational model (such as 4+0 and 2+2) confounds the effect of grade on mental health, because different models create entirely different time pressure trajectories. For example, while third-year students in the 4+0 program may have already achieved adaptive stability, their peers in the 2+2 program are simultaneously facing intense visa preparations, upcoming relocation, and higher academic requirements, thereby masking the expected linear increase in mental health with grade. Thus, improving students' adaptation and mental health should not rely solely on increasing the number of overseas opportunities; it also requires optimizing academic norm instruction and support network construction during the domestic stage.

From a theoretical perspective, this study separates "academic cultural adaptation" from the broader concept of "sociocultural adaptation" and constructs a six-dimensional measurement model. This represents a significant contribution to research on TNHE student populations. The results initially establish the pathway through which "academic cultural adaptation influences mental health", clearly indicating that "cultural value internalization" and "reconstruction of teacher-student power distance" are more core psychological protection mechanisms than the mere "acquisition of knowledge and skills". This provides a new theoretical basis for future research in cross-cultural educational psychology.

From a practical perspective, these findings have direct implications for the teaching

and management of TNHE. First, for new students who have just enrolled, current intervention measures generally focus on improving language proficiency and introducing learning skills. This study suggests that orientation programs for new students should be initiated earlier and emphasize the experiential learning of "academic cultural ethics". Through simulated cases and role-playing, these programs should not only teach students "how to cite" but also enable them to understand the cultural and ethical logic behind Western academic integrity. Second, the barriers in teacher-student interactions must be systematically dismantled. It is not only necessary to encourage students to reach out unilaterally, but also to provide systematic training on Chinese culture and student psychology for foreign teachers. Furthermore, institutions should organize institutionalized yet informal teacher-student communication activities to create a more equal and inclusive interaction culture, thereby providing practical socio-emotional support for students. These measures are crucial for alleviating students' deep-seated cultural anxiety and actively promoting their mental health.

Conclusion

In conclusion, this study has clearly demonstrated that in CFCRS programs, academic cultural adaptation is a key indicator influencing the mental health of Chinese undergraduate students. Contrary to traditional perceptions, an important correlate of psychological stress among this group is not the explicit instrumental challenges such as language barriers, academic load, or evaluation methods, but rather the deep and implicit cultural shock, namely the differences in academic ethical norms between China and the West and the conflicting power distance between teachers and students. The study has confirmed that students who can successfully internalize Western academic integrity values and establish positive interactions with foreign teachers exhibit better mental health; and cumulative academic socialization is the core driving force for this adaptation process.

At the theoretical level, this study innovatively constructed a six-dimensional measurement model for academic cultural adaptation, revealing the psychological protective effects of cultural value reconstruction and socio-emotional support in a cross-cultural academic environment. At the practical level, the results of this study call for a transformation in the intervention

paradigm of cross-cultural higher education programs. The focus of administrators must expand from merely language improvement and skill training to cultural ethics guidance and the construction of interaction networks.

To achieve this, universities should not only incorporate experiential teaching on academic ethics into the freshman orientation programs, but also should systematically provide training for foreign teachers on the psychology of Chinese students and local culture. By breaking down institutional barriers and building a truly equal, inclusive and supportive daily academic interaction environment, educators can effectively alleviate students' deep cultural anxiety. This is not only an essential requirement for implementing a student-centered educational philosophy, but also a key path to ensuring the high-quality and sustainable development of global cross-cultural higher education programs.

This study adopted a cross-sectional design. Although the SEM supportrf the predictive effect of academic cultural adaptation on mental health, we cannot establish strict causal relationships. Future research can adopt a longitudinal design to track the dynamic adaptation trajectory of students from freshman to senior year, in order to more accurately capture the long-term causal effect of academic cultural adaptation on mental health. In terms of sample, this study mainly obtained data through purposive sampling and snowball sampling, and the sample was mainly concentrated on a limited number of CFCRS programs. Due to the possible subtle differences in academic cultural traditions among different foreign partner institutions (such as the UK, the US, Australia, etc.), future research can expand the sample size and conduct stratified sampling comparisons across regions and across partner countries to further enhance the external validity/generalizability of the research results. Finally, the SDS employed in the present study is limited to the assessment of depressive symptoms and thus cannot fully capture the overall mental health. Future research may seek to incorporate alternative scales to measure additional indicators associated with mental health.

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