Applied & Educational Psychology (2026)
Clausius Scientific Press, Canada

DOI: 10.23977/appep.2026.070211
ISSN 2523-5842 Vol. 7 Num. 2

Interrelationships among Psychological, Sociocultural, and Academic Adaptation in International Students: A Systematic Review

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Keywords: Psychological Adaptation; Sociocultural Adaptation; Academic Adaptation; International student

Abstract: The continued internationalization of higher education has contributed to the growing number of international students, bringing increasing attention to their cross-cultural adaptation. A systematic search was conducted on Scopus, Web of Science, and the Education Resources Information Center (ERIC)from inception to 19 September 2026 following the PRISMA guidelines. Articles were selected based on the predetermined eligibility criteria. This review aims to integrate existing evidence on the interrelationships among psychological, sociocultural, and academic adaptation, thereby providing a clearer understanding of the multidimensional nature of international students' cross-cultural adaptation and the connections among its constituent domains.

1. Introduction

International students must adjust simultaneously to the new environment and the unfamiliar education system. This transition may involve emotional and psychological stress, challenges in navigating everyday sociocultural life, and difficulties in meeting unfamiliar academic demands[1-4]. Psychological adaptation (PA) primarily concerns individuals' emotional states, mental health, and subjective well-being during cross-cultural transitions, whereas sociocultural adaptation (SCA) emphasizes their behavioral competence in managing everyday life, interpersonal interactions, and social situations within the host cultural environment[5]. Ward and Kennedy demonstrated that, although the two domains are related, they differ substantially in their theoretical foundations, predictors, and patterns of change[6]. This two-dimensional framework has since become an important theoretical basis for research on the cross-cultural adaptation of international students[7-9]. Academic adaptation refers to the process of adjusting to the academic demands of a new educational environment[10-11].

Yu found that both sociocultural and academic adaptation among international postgraduate students were closely associated with their satisfaction with the study-abroad experience[12]. However, existing reviews of cross-cultural adaptation have focused primarily on psychological adjustment and sociocultural adaptation[13-16]. Accordingly, this review focuses on the empirical relationships among psychological adaptation (PA), sociocultural adaptation (SCA), and academic adaptation (AA).

RQ1: How have psychological adaptation, sociocultural adaptation, and academic adaptation been

conceptualized and measured in empirical studies of international students?

RQ2: What relationships among psychological adaptation, sociocultural adaptation, and academic adaptation have been identified in the existing literature on international students?

RQ3: What individual, interpersonal, methodological, and contextual factors may account for variations in the relationships among the three adaptation domains?

2. Methods

Sections of Methods and Results was reported in accordance with PRISMA 2020 guidelines. The target population comprised international students enrolled in higher education institutions outside their countries of origin. Undergraduate, master's, doctoral, and exchange students were eligible for inclusion. Immigrants, refugees, K-12 students, and domestic ethnic minority students were excluded unless they met the definition of international students in higher education.

2.1 Search Strategy

Following the PRISMA 2020 flow diagram (Figure 1), a systematic search was conducted in Scopus, Web of Science, and the Education Resources Information Center (ERIC) from database inception to September 19, 2026. The search strategy included three combinations of terms: international students AND PA AND SCA; international students AND PA AND AA; and international students AND SCA AND AA.

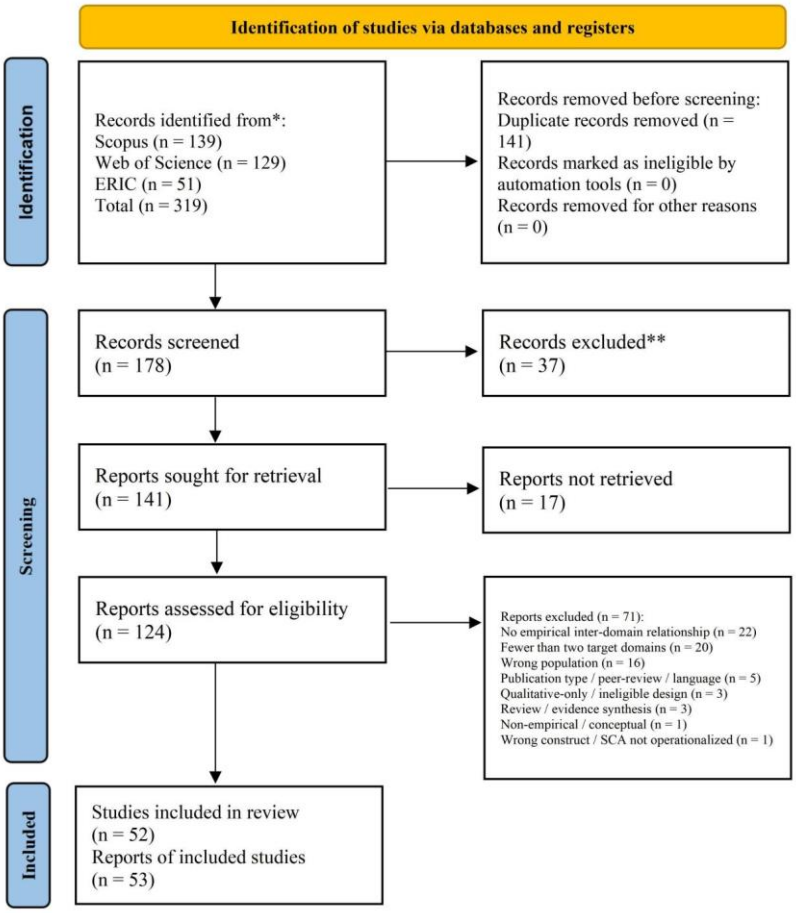


Fig. 1. Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) study selection flow diagram

2.2 Study Selection and Eligibility Criteria

Studies were initially screened for relevance based on their titles and abstracts, after which full texts were retrieved and assessed for eligibility. Studies were included if they met the following criteria: (1) participants were international students enrolled in higher education institutions outside their country or region of nationality; (2) at least two of the three target domains-psychological adaptation (PA), sociocultural adaptation (SCA), and academic adaptation (AA)-were measured; (3) an empirical relationship between at least two target adaptation domains was analyzed or reported; (4) the study employed a quantitative cross-sectional or longitudinal design, or a mixed-methods design from which quantitative data on the relationship between at least two adaptation domains could be extracted; and (5) the study was a peer-reviewed empirical article published in English or Chinese.

Studies were excluded if they: (1) measured multiple adaptation domains but did not analyze or report the relationships among them; (2) were purely qualitative studies, reviews, conceptual papers, editorials or commentaries, dissertations or theses, or other non-peer-reviewed publications; (3) were published in languages other than English or Chinese; or (4) had no accessible full text.

2.3 Data Extraction and Quality Appraisal

A standardized data extraction form was used to collect the following information: (1) study characteristics, including author(s), year of publication, title, DOI, and journal; (2) study population characteristics, including host country, students' countries or regions of origin, and sample characteristics; and (3) study design and measurement time points, operationalization of PA, SCA, and AA, direct relationships between PA-SCA, PA-AA, and SCA-AA, directionality of these relationships, mediators, moderators, and control variables, and extractable statistical information.

The methodological quality of the included studies was assessed using the Joanna Briggs Institute (JBI) critical appraisal tools appropriate to each study design.

3. Results

3.1 Search Results

A total of 319 records were identified, of which 141 duplicates were removed before screening. Following title and abstract screening, a further 37 records were excluded. After 17 reports for which the full text could not be obtained were excluded, 124 full-text reports were assessed for eligibility. Of these, 71 were excluded for not meeting the inclusion criteria, resulting in 53 articles included in the review. Two of the included articles were companion publications based on the same sample of 259 international students. These two articles were therefore treated as representing a single sample, yielding 52 independent samples for the review.

3.2 Study Characteristics

The included studies were conducted spanning four continents: Asia, Europe, North America, and Oceania[17-20]. Sample sizes varied considerably, ranging from approximately 70 to more than 2,000 participants, with most samples comprising international students from diverse cultural backgrounds[21-23]. Overall, cross-sectional designs predominated, with only a limited number of studies employing longitudinal or multiple-wave designs[24-25]. Thus, the available evidence primarily reflects concurrent relationships among the three adaptation domains, with relatively few studies capable of examining changes over time or temporal ordering among them.

Considerable heterogeneity was observed in the measurement of PA, SCA, and AA. PA was

operationalized most diversely, using both dedicated adaptation measures, such as the Brief Psychological Adaptation Scale and indicators of mental health, including depression, anxiety, self-esteem and satisfaction [26-29]. In contrast, the measurement of SCA was relatively consistent, with most studies using the Sociocultural Adaptation Scale (SCAS) or its revised[30-34]. AA was assessed less frequently and showed greater variation in operationalization. Measures included the Academic Adjustment Scale[35-37]. Some studies instead used indicators such as academic performance[11].

3.3 Relationships Among Domains

Better psychological adaptation was generally associated with better sociocultural adaptation, although the strength of this association varied across studies[38-41]. In comparison, evidence on the relationship between psychological and academic adaptation was more limited, with studies reporting positive associations as well as weak or statistically nonsignificant relationships[42-43]. Findings for the relationship between sociocultural and academic adaptation were ranging from nonsignificant or weak associations to relatively strong positive associations[44]. Overall, psychological, sociocultural, and academic adaptation were empirically interrelated, but the available evidence does not support treating them as interchangeable constructs.

3.4 Factors Influencing Relationships Among Domains

Studies suggest that variation in the relationships among PA, SCA, and AA may be associated with a range of individual, interpersonal, and contextual factors. Recurring factors included perceived cultural distance and discrimination, social support, language competence, acculturation orientation, motivation, cultural intelligence and length of residence or stage of adjustment in the host country[45-48]. In addition, network-related factors have also been considered as potential influencing factors, such as social media use[49-51].Overall, these findings indicate that relationships among the three adaptation domains may vary across contexts.

3.5 Quality Appraisal

Table 1 Results of study quality appraisal of the included studies

Design group	JBI item	Yes	No	Unclear	N/A
Cross-sectional (n=47)	Q2	21	0	26	0
Cross-sectional (n=47)	Q2	0	0	0	47
Cross-sectional (n=47)	Q3	37	0	10	0
Cross-sectional (n=47)	Q4	37	0	10	0
Cross-sectional (n=47)	Q5	30	2	15	0
Cross-sectional (n=47)	Q6	14	30	3	0
Cross-sectional (n=47)	Q7	47	0	0	0
Cross-sectional (n=47)	Q8	32	0	15	0
Longitudinal/cohort (n=6)	Q1	2	0	4	0
Longitudinal/cohort (n=6)	Q2	4	0	2	0
Longitudinal/cohort (n=6)	Q3	4	0	2	0
Longitudinal/cohort (n=6)	Q4	3	0	3	0
Longitudinal/cohort (n=6)	Q5	3	0	3	0
Longitudinal/cohort (n=6)	Q6	3	0	2	1
Longitudinal/cohort (n=6)	Q7	4	0	2	0
Longitudinal/cohort (n=6)	Q8	5	0	1	0
Longitudinal/cohort (n=6)	Q9	4	0	2	0
Longitudinal/cohort (n=6)	Q10	3	0	3	0
Longitudinal/cohort (n=6)	Q11	6	0	0	0

As shown in Table 1, all 53 included reports underwent quality appraisal. Of these, 47 provided cross-sectional quantitative evidence and were assessed using the revised JBI analytical cross-sectional framework, while the remaining six longitudinal or cohort-like reports were evaluated using the JBI cohort framework. Statistical analyses were judged appropriate in all studies.

4. Conclusion

4.1 Theoretical Sources of Measurement Heterogeneity Across the Three Domains

PA showed the greatest measurement heterogeneity. The measurement heterogeneity of psychological adaptation stems from its broad conceptual scope. Studies employ either adaptation-specific scales or mental health indicators[52], reflecting varying conceptualizations of this construct. Compared with PA, the measurement of SCA showed substantially greater consistency, possibly because the field has developed a clearer theoretical definition and a more established measurement tradition. AA's primarily stems from the conflation of adaptation processes with educational outcomes. This reflects not only a lack of standardized measurement but also unclear conceptual boundaries. More clearly defining the conceptual boundaries of the three adaptation domains and improving consistency in their measurement are therefore essential for strengthening the cumulative evidence base and cross-study comparability of research on international student adaptation.

4.2 Implications of Relationships Among Domains

The observed PA-AA and SCA-AA relationships further suggest that, academic adaptation should not be viewed solely as an educational outcome of cross-cultural adaptation but may constitute an important component of the adaptation process itself[53-54]. Thus, future research on cross-cultural adaptation should further consider the development of an integrated PA-SCA-AA framework. Placing psychological, sociocultural, and academic adaptation within a common theoretical framework while maintaining their conceptual and measurement distinctions may provide a more comprehensive account of the structure and complexity of international students' cross-cultural adaptation.

4.3 Implications of Factors Shaping Relationships Across Domains

The available evidence suggests that individual resources, social relationships, and intercultural contexts may be associated with different adaptation domains and their interrelationships, but the specific ways in which these factors operate have yet to be systematically established. Future research should therefore incorporate individual, interpersonal, and contextual factors more systematically within a multidimensional PA-SCA-AA framework and use theory-driven moderation analyses, comparative designs, and longitudinal approaches to examine the stability and variation of cross-domain relationships under different conditions. In this way, research on international student adaptation can move beyond describing that different adaptation domains are interrelated toward explaining when, for whom, and under what contextual conditions these relationships vary, thereby contributing to a more context-sensitive framework of multidimensional adaptation.

4.4 Limitations

This review has several limitations. First, the available evidence was dominated by cross-sectional studies, with relatively few longitudinal studies, limiting conclusions about temporal directionality and reciprocal relationships among PA, SCA, and AA. Second, substantial heterogeneity in construct definitions, measurement instruments, and scoring approaches limited direct comparability across

studies. Finally, some studies provided insufficient control for potential confounding factors, meaning that observed cross-domain relationships may partly reflect other individual or contextual influences.

5. Conclusion

The adaptation of international students has long been a prominent topic in academic research[55].The available evidence indicates that the three domains are interrelated but may develop at different rates and under different individual, interpersonal, institutional, and cultural conditions. Future research on international student adaptation requires more longitudinal, and cross-domain studies to clarify how these domains develop and relate to one another over time.

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