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The Domains of Cross-cultural Adjustment: An Empirical Study With International Students

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ABSTRACT

This study examines the dimensionality of a new measure of international students' adjustment using a sample of 189 international students. Drawing on earlier conceptualizations of cross-cultural adjustment as a person-environment fit and a previous scale measuring adjustment from the expatriate literature, this study shows that this scale can be meaningfully adapted to the higher education context. Confirmatory factor analyses identified a stable 8-factor structure with adequate psychometric properties. Descriptive analysis confirms that international students are fairly adjusted in a number of distinct domains. The findings also provide criterion-related validity by showing positive associations between host social interaction and host connectedness and students' adjustment. This study contributes to the literature by offering a theoretically based scale that assesses international students' adjustment on a wide range of dimensions. It puts forward a useful tool for higher education counsellors and support services to monitor international students' adjustment and avoid adjustment difficulties.

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The number of mobile students worldwide has expanded massively over the last two decades and is expected to grow further in the next 15 years (Organisation for Economic Co-operation and Development [OECD], 2019). According to the Organization for Economic Co-operation and Development (OECD), in 2017 approximately 3.7 million foreign students were engaged in higher education programs across the OECD countries, a figure which reached 5.3 million for the world as a whole (OECD, 2019). Worldwide, most students choose the United States (US), the United Kingdom (UK), and Australia to study abroad (Abdullah et al., 2014), although other non-traditional destinations are emerging, like the United Arab Emirates (UAE) and Russia (Johnson, 2020). In Europe, the proportion of international students has increased markedly in the past decade, and in 2018, 1.3 million students from abroad were undertaking tertiary-level studies across the EU Member States (European Commission [EC], 2021). Compared with other parts of the world, European students go abroad for shorter periods mostly under the umbrella of the Erasmus⁺ mobility program (Mikulas & Jitka, 2019). Multiple factors drive this worldwide increase in students mobility, such as European policies that foster mobility within the region (as is the case of Erasmus and Erasmus⁺) and other countries' policies aiming to provide access to quality learning environments in science, technology, engineering, and maths (STEM), including computer science (OECD, 2019).

In this research, we follow the OECD (2019) definition of international student to include all tertiary students “*who received their prior education in another country and are not residents of their current country of study*” (p. 236), thus including foreign students (i.e., students who are not citizens of the country in which they study); credit mobility students (i.e., students who are temporarily studying abroad to gain academic credit within the framework of a tertiary education program at their home institutions, such as Erasmus⁺ exchange students); and other degree mobility students (i.e., external students enrolled as regular students with the aim of graduating in the country of destination).

It has long been recognized that studying in an unfamiliar cultural environment and through the medium of a foreign language poses a myriad of challenges for international students (Conroy & McCarthy, 2019; Spencer-Oatey & Dauber, 2019) and that failure to integrate the new cultural and academic environment can impact both their mental well-being as well as their academic achievement (Duru & Poyrazli, 2011; Gómez et al., 2014) and satisfaction (Merola et al., 2019). Consequently, the study of student adjustment has attracted attention from at least the 1950s (e.g., Abdullah et al., 2014; Smith, 1955; for an overview see Church, 1982) to the present day (e.g., Harzing, 2004; Jing et al., 2020; Li & Gasser, 2005; Mesidor & Sly, 2016). This growth in interest was accompanied by a proliferation of both conceptualizations and operationalization of student adjustment with no consensus emerging (Pedersen et al., 2011). This prevented a meaningful integration of research findings and impeded the growth

of a cumulative body of knowledge (Heng, 2020; Spencer-Oatey & Dauber, 2019). Some commonly used instruments to assess students adjustment, such as the Student Adaptation to College Questionnaire (SACQ; Baker & Siryk, 1984), have been shown to be seriously deficient with regard to their psychometric properties (Taylor & Pastor, 2007). Moreover, the uncritical application of instruments developed to measure adjustment among domestic students has been criticized for missing issues uniquely relevant to international students and for being possibly culturally biased (Anderson et al., 2016). Lacking a valid and reliable instrument for assessing international students' adjustment is unfortunate because having a precise diagnosis of adjustment problems is of great interest to a number of stakeholders. Pinpointing international students' adjustment challenges would allow higher-education institutions (HEIs) to target their counseling and support where it is most likely to be effective, benefitting both the international students and university budgets.

So far, and up to our knowledge, there still remains a need for more information about students' experience outside the leading countries (i.e., United States/Canada, United Kingdom, and Australia/New Zealand) and for non-English-speaking destinations (Abdullah et al., 2014), including an analysis of the dimensions of the host environment that are important to international students' matching (Jing et al., 2020). Although international students' cross-cultural adjustment is a popular topic in global research, this research addresses earlier calls (e.g., Abdullah et al., 2014; Jing et al., 2020) to (i) understand students' experience and cross-cultural adjustment outside the countries that are the major hosts of international students globally; and (ii) complement the existing literature on examining the role of host social interactions and students' social integration.

In the remainder of this article, we will provide a brief overview of the instruments that have been used to assess international student adjustment and identify some of the weaknesses connected to their use. We will then draw on a parallel discussion in the business and management community, which has grappled with similar problems when measuring the adjustment of business expatriates. Borrowing from this literature, we will suggest an alternative approach to conceptualizing and measuring the adjustment of international students before presenting a preliminary test of this instrument with an international student sample from a public European university. We will then establish criterion-related validity by showing positive associations between host social interaction and host connectedness and students' adjustment. Finally, we will discuss how the findings contribute to a wider understanding of students' experience abroad including their cross-cultural adjustment, namely into non-English-speaking destinations.

APPROACHES TO MEASURING INTERNATIONAL STUDENTS' ADJUSTMENT

An early review by Church (1982) identified a plethora of indicators researchers chose to assess international students' adjustment, among them academic/professional performance, degree of social interaction with locals, students' satisfaction, and other

outcomes, such as an international perspective, including a positive attitude toward the destination along with personal and professional growth. A later review by Searle and Ward (1990) added other factors, such as students' acceptance of other cultures, skills and coping, emotions, and behavioral changes. They also deplore the proliferation of terms adopted for the phenomenon of coming to terms with cultural contact, such as adaptation, acculturation, adjustment, and accommodation, which are often used interchangeably.

In terms of the theoretical frameworks used to guide the study of intercultural contact, Searle and Ward (1990) identified three distinct approaches: clinical perspectives, social learning models, and social cognition approaches. A review by Zhou et al. (2008) essentially comes to the same conclusion, distinguishing between stress and coping models, culture learning, and social identification, which they identify as affective, behavioral, and cognitive models. A look at recent studies of international student adjustment shows that this multitude of theoretical approaches, conceptualizations, and operationalizations persists (e.g., Shafaei & Razak, 2016), especially with regard to the stress and coping and behavioral perspectives (Smith & Khawaja, 2011). Brisset et al. (2010) studied psychological distress using Bradley's (1994) well-being questionnaire; Duru and Poyrazli (2011) employed Stroebe et al.'s (2002) Utrecht Homesickness Scale; Wang et al. (2012) relied on Derogatis' (2001) Brief Symptom Inventory; and Yang and Noels (2013) on Radloff's (1977) Center for Epidemiologic Studies Depression Scale.

A number of studies still employ the SACQ (e.g., Gómez et al., 2014; Gonzalez et al., 2012) despite Taylor and Pastor's (2007) scathing criticism of its psychometric properties. With regard to social learning approaches, a consensus emerged pertaining the use of Ward and Kennedy's (1999) Socio-cultural Adaptation Scale (SCAS) (or a variant thereof). This scale was used recently by Yu et al. (2019), and previously by Brisset et al. (2010), Kashima and Loh (2006), Lee and Ciftci (2014), Li and Gasser (2005), or Yang and Noels (2013).

With the possible exception of comparatively widespread adoption of the SCAS, we have to conclude that the study of international student adjustment is as fragmented as ever, both in terms of theoretical approach as well as instrumentation, preventing meaningful integration, and the growth of a cumulative body of knowledge. The closest we have come might be a meta-analysis by Wilson et al. (2013), exploring the correlates of cultural adjustment as assessed by the SCAS. This meta-analysis included samples of business expatriates, immigrants, and mixed samples, including international students (57.6%) that accounted for the largest proportion of participants.

WEAKNESSES IN PAST APPROACHES TO MEASURING INTERNATIONAL STUDENT ADJUSTMENT

While the SCAS may have "the most empirical foundation of any measure used in the study of intercultural relations" (Gudykunst, 1999, p. 553), it is not without problems. Wilson (2013) drew attention to valence, the assumption implicit in the SCAS that adjustment is inherently difficult, as expressed in the item wording and

the response options (“Please indicate how much difficulty you experience in...”, 1 = No difficulty; 5 = Extreme difficulty), and the fact that most researchers employing the SCAS conceive socio-cultural adjustment as taking place in a single domain (i.e., treating the SCAS as unifactorial), when it is known that students’ adjustment abroad is inherently multidimensional (Gilbreath et al., 2011; Hua et al., 2020).

In the related international human resource management literature, it has long been acknowledged that the cross-cultural adjustment of international employees is a multi-faceted phenomenon (e.g., Black & Gregersen, 1991; Thomas, 1998). However, the single conceptualization and operationalization of adjustment from Black and colleagues (Black et al., 1991; Black & Stephens, 1989), had arguably been even more dominant in the expatriate literature than the SCAS is in the students’ adjustment literature. This conceptualization conceives adjustment as “the perceived degree of psychological comfort with various aspects of the host country” (Black & Gregersen, 1991, p. 463) and distinguishes three separate environmental domains: adjustment to the workplace, to interacting with host nationals and to the general environment (Black et al., 1991), represented by a total of 14 items (Black & Stephens, 1989).

Similar to Wilson’s (2013) critique of the SCAS, Hippler et al. (2014) have questioned whether the item wording (“How adjusted are you to...”) adequately reflects the construct’s intended conceptualization. Moreover, Hippler et al. (2014) raised concerns about how the environmental facets represented in the items were selected and the implicit assumption—that could equally be leveled against the SCAS—that all environmental aspects are of equal importance.

In response to these concerns, Hippler et al. (2014) developed an alternative scale to measure the cross-cultural adjustment of business expatriates. As we believe that this alternative scale addresses a number of parallel concerns pertaining to the measurement of the adjustment of international students, this study intends to establish whether this approach can be meaningfully used in the higher education context and the new scale adapted and applied with international student populations from multiple origins and located in different destinations.

In the following, we will anchor international student adjustment in the person–environment fit literature before then defining students’ adjustment by introducing the new scale and outlining how it addresses the concerns identified.

INTERNATIONAL STUDENTS’ ADJUSTMENT AS A PERSON–ENVIRONMENT (P–E) RELATIONSHIP

The wider psychological literature conceives of adjustment as person–environment (P–E) fit, as “the goodness of fit between the characteristics of the person and the properties of the environment” (French et al., 1974, p. 316). Students cannot simply ‘adjust’; they can only ‘adjust to’ something or someone. It is thus immediately obvious that the environment is integral to the understanding of adjustment (Gilbreath et al., 2011). Yet every environmental facet will not be of equal importance to every individual (Conroy & McCarthy, 2019); for some students’ new friendships at the host location or institution may

emerge as more important than coming to terms with the local public transport; for other students maintaining contact with family back home might be more important. Hippler et al. (2014) maintained that it is the interaction between the degree of adjustment to a particular environmental facet and the importance ascribed to that facet rather than the degree of adjustment alone that determines overall student adjustment, well-being, and other more distal outcomes. Finally, adjustment is not determined by the individual or the environment alone, but by the interaction between them. Studying through the medium of a foreign language may be perceived as an unwelcome threat by some students, yet by others as a welcome challenge or an opportunity to finally put to good use the language skills they have acquired. Being in a culturally unfamiliar environment may be experienced as exciting (positive) or frightening (negative). With any relocation an individual's environment changes, and it is thus important that any measure of adjustment takes the perceived direction of change into account—is the change in a particular facet a change for the better or a change for the worse?

To accommodate the fact that (1) environmental facets are unlikely to be of equal importance and (2) the direction of change might differ from one individual to the next, Hippler et al. (2014) developed a 35-item alternative adjustment scale, established its dimensionality, and provided preliminary validity evidence. This scale, developed for international employees from multiple origins and locations in a business context, tapped into ten different life domains (language, work environment, job or task characteristics, work-life balance, leisure time, family life, local friendships, contact to those left behind, living quarters, and urbanity). Criterion-related validity was established by positive associations with self-rated performance, self-rated development, and general satisfaction.

It is our purpose in this study to draw on the person–environment fit approach and operationally define students' cross-cultural adjustment as the perceived harmony (or satisfaction, or comfort) within the P–E relationship in different life domains. We aim to establish whether the scale developed by Hippler et al. (2014) can be meaningfully adapted to the higher education context and applied with international student populations from multiple origins and locations. We believe that the concerns it was designed to address in the business expatriate literature are equally pertinent in international tertiary student populations (i.e., foreign students, credit mobility students, and other degree mobility students). Furthermore, this intent addresses Gilbreath et al.'s (2011) call to use more specific and precise measurement of fit factors relevant to international students.

To assess whether the adapted instrument can be used with international student populations, we (a) tested whether the dimensionality of the scale holds with a sample of international students from a public European university; and (b) started building the nomological network by relating student adjustment as measured with our scale to theoretically related constructs, such as social interaction with host nationals and social connectedness with host nationals (Zhang & Goodson, 2011a). We expect social interaction and social connectedness to be linked to the “social” facets of our adapted scale (e.g., language, local friendships, or leisure time), but not related to the inanimate facets such as urbanity or the living quarters.

METHOD

In 2018, there were 1.3 million students from abroad who were undertaking tertiary-level studies across the EU-27 (EC, 2021). For most EU Member States, the principal country of origin for students was another Member State, although in Southern Europe (e.g., France, Spain, Portugal, and Cyprus), a large proportion of students from abroad came from Asia, Africa, the Caribbean, and the Central and South America. This makes Southern Europe an ideal context to understand international students' experience in non-English-speaking locations, including the assessment of their cross-cultural adjustment. To this purpose, a survey was developed based on Hippler et al.'s (2014) scale to collect the data on students' cross-cultural adjustment while abroad.

International students enrolled in a Southern European public university were invited by email to participate in this study. An initial invitation was sent to the 2,173 international students who were enrolled for the first time in the fall semester of the school year of 2013/2014. To make the results as broadly applicable as possible, incoming and outgoing international students (i.e., foreign students, credit mobility students, and degree mobility students) were surveyed. The email informed them about the research purpose and contained a link to the survey. A reminder was sent two weeks after the initial invitation. All data were collected following students' arrival (late September) and during the first four weeks of the semester (i.e., October), to make comparable the length of time they were in the host country. Participation was voluntary and replies were anonymous, except for students aiming to qualify for a dinner voucher, who were asked to leave an email address at the end of the survey.

Sample

Overall, 189 international tertiary students replied. The sample consisted of international students originated from 33 countries and located in 22 countries, but all were under the umbrella of the Erasmus+ program, as 2014 was the first year of the program (EC, 2021). Of those reporting, 60.6% were female, 72.6% were undergraduates and had host language skills. Of those mentioning the field of study 30.2% were from business, administration, and law, followed by engineering (23.8%), and others (23.3.5%). Table 1 summarizes the demographic characteristics of the sample, which are comparable to other Erasmus samples (e.g., Mikulas & Jitka, 2019).

Table 1: Sample Characteristics

	<i>n</i>	<i>%</i>	<i>Mean</i>	<i>SD</i>
Age			23.21	3.83
Gender			0.39	0.49

		<i>n</i>	%	<i>Mean</i>	<i>SD</i>
	Male	69	39.4		
	Female	106	60.6		
Home region				0.77	0.42
	EU countries	131	74.9		
	Non-EU countries	44	25.14		
Host region				0.99	0.08
	EU countries	172	98.3		
	Non-EU countries	3	1.71		
Host Language skills	Yes	127	72.6	0.73	0.45
	No	48	27.4		

Note: *n* varies between 175 and 189, mean and standard deviation calculated for dummy code variable.

Measures

The survey instrument was designed in English and made available online. The questionnaire took approximately 15 mins to complete. A preliminary version was pilot tested with a similar (but smaller) international student sample, and the instrument was revised in accordance with their feedback.

Cross-cultural Adjustment

This was measured adapting Hippler et al.'s (2014) expatriate adjustment scale. The original 35 items were reworded to fit the student context. For each domain, participants were asked to indicate "How significant is the change you are experiencing" on a scale ranging from (1) "*this change is insignificant in my life*" to (4) "*this change is very significant in my life.*" Sample items included: "*How significant is the change you are experiencing regarding the host students' method of studying, in general*" or "*How significant is the change you are experiencing regarding the autonomy in organizing and structuring the tasks at the host school.*" For each item respondents also had to indicate if the change they experienced was positive (+1), neutral (0), or negative (-1). Therefore, the students' level of adjustment was computed by multiplying the direction of the change with the significance of the change, resulting in a range from (-4) to (+4), extending from "*a very significant negative change*" to "*a very significant positive change*". Cronbach's alpha coefficient for the entire scale was 0.87.

Social Interaction with Host Nationals

Items were adapted from Zhang and Goodson's (2011a) nine-item scale, which measures two dimensions of social interaction with host nationals: quantity and quality. This scale was adapted to the exchange student context (e.g., "*During the last weeks, how often did you visit host nationals' homes?*"). For the items assessing the quantity of social interactions with locals, a five-point Likert scale was used, ranging from (1) "*rarely or never*" to (5) "*very often*", while for the quality items a five-point Likert scale ranging from (1) "*not at all*" to (5) "*very*" was used. Cronbach's alpha coefficient for the nine-item scale was 0.86. The separate scales (quantity and quality) had reliability coefficients of 0.85 and 0.81, respectively.

Social Connectedness with Host Nationals

The eight items from Zhang and Goodson (2011a) were used and reworded to fit the study context. To answer, the respondents used a six-point Likert scale, ranging from (1) "*strongly disagree*" to (6) "*strongly agree*". Cronbach's alpha coefficient for this scale was 0.91.

Control Variables

Demographics known to influence international students' adjustment (Zhang & Goodson, 2011b), such as age, gender, home, and destination regions, and host language skills were used as control variables. Age was computed in years. Gender was dummy-coded (1 = Male; 0 = Female) as well as host language skills (1 = Yes; 0 = No) and home and host regions (1 = EU region; 0 = non-EU region).

Data Analysis and Scale Validity

Given that the dimensionality of the expatriate adjustment scale is known (from Hippler et al., 2014), we considered conducting a confirmatory factor analysis (CFA) more appropriate than applying exploratory factor analysis to assess the factor structure. At the same time, we expected possible variations in the scale throughout the analysis, given that some items may function differently in a student population compared with business expatriates. For example, it is possible, if not likely, that students will think of their parents and siblings when asked about their family, whereas business expatriates are more likely to have their spouse or partner and children in mind.

To check for univariate normality, skewness and kurtosis were assessed for all 35 adjustment items. All skew indices were in the range -1.41 and 0.50 , and all kurtosis indices were between -1.34 and 0.70 . According to Kline (2005), only variables with skewness values greater than 3 and kurtosis values greater than 10 are of concern. We therefore proceeded to the CFA.

The CFA was conducted with AMOS 21 to confirm and refine the 10-factor structure established by Hippler et al. (2014). To evaluate model fit, we used several indices: Chi-square statistic, root-mean-square error of approximation (RMSEA), comparative fit index (CFI), and Tucker-Lewis index (TLI). In

assessing model fit, we followed recommendations by Hu and Bentler (1999), who suggested that RMSEA of 0.08 or less and CFI and TLI above 0.90 indicate at least adequate fit, with RMSEA of 0.05 or less indicating close fit.

The results of the initial CFA did not indicate good model fit (Chi-square = 915.18; $df = 515$), whereas the RMSEA indicated adequate fit (0.064), the CFI and the TLI did not (0.813 and 0.785, respectively). A look at the factor loadings revealed that four items did not reach the minimum threshold of 0.45, which Comrey and Lee (1992) considered fair. We therefore removed these four items from further analysis. This resulted in ‘work-life balance’ and ‘family life’ becoming single item factors. These single items were therefore also removed, and we proceeded with the remaining 8-factor structure. We reran the analysis and repeated the process twice more until no further factor loadings below 0.45 remained. While model fit improved as a consequence, it still fell short of the desired threshold for the TLI (Chi-square = 423.88, $DF = 271$; RMSEA = 0.055; CFI = 0.905; TLI = 0.886). We therefore proceeded to examining the modification indices. This suggested allowing two of the error variances for items reflecting the language factor to covary. Adding this path resulted in a further improvement and overall adequate fit (Chi-square = 401.712, $df = 270$; RMSEA = 0.051; CFI = 0.918; TLI = 0.901).

This 26-item, 8-factor scale was therefore retained as the final model (see Table 2), so the key adjustment domains are work/academic environment, language, study or task characteristics, leisure time, urbanity, living quarters, local friends, and contact to those left behind. Most subscale internal consistency reliability coefficients were acceptable at 0.70 and above (Nunnally, 1978) except for the dimensions that had items deleted and are composed by two or three items, which usually have lower reliability scores (Peterson, 1994).

Table 2: International Students’ Adjustment: 26 Items and 8-factor Scale Retained as the Final Model

Factor	Items	N Items	Cronbach alpha	Mean	SD
Work environment	1–7	7-item Factor	0.798	0.95	1.45
Language	8–12	5-item Factor	0.863	1.01	2.14
Study or task characteristics	14–15	2-item Factor	0.608	1.37	2.04
Leisure time	19–21	3-item Factor	0.732	1.84	1.82
Urbanity	22–24	3-item Factor	0.662	0.61	1.75

Factor	Items	N Items	Cronbach alpha	Mean	SD
Living quarters	28–29	2-item Factor	0.662	1.00	2.12
Local friendships	32–33	2-item Factor	0.757	1.38	2.24
Contact to those left behind	34–35	2-item Factor	0.677	0.91	2.19
Overall Adjustment Scale		26-item scale	0.868	1.09	1.15

To determine the criterion-related validity of this new students’ adjustment scale, the validity was assessed by examining the associations between students’ social interaction in the destination and host connectedness (Zhang & Goodson, 2011a) as antecedents of students’ adjustment, as measured by the new 26-item scale and its subscales.

RESULTS

Table 3 presents the descriptive statistics and zero-order correlations for all variables. There are significant and positive relationships between the composite adjustment measure and all subscales, as well as between self-rated host social interaction and connectedness and self-rated adjustment except for the facets of urbanity, living quarters and contact to those left behind. These results provide initial evidence of criterion-related validity.

Given that students’ adjustment could vary from (–4) meaning a very negative change to (+4) for a positive change, one can observe that participants experienced a positive life change, especially pertaining to their leisure time ($M = 1.84$; $SD = 1.82$), local friendships ($M = 1.38$; $SD = 2.24$), and local study/task characteristics ($M = 1.37$; $SD = 2.04$). The quality of host social interactions and host connectedness were also fairly positive respectively ($M = 3.83$; $SD = 0.85$; and $M = 3.95$; $SD = 1.15$).

To determine whether host social interaction and host connectedness predict the ‘social’ facets of students’ adjustment, several stepwise regression analyses were performed. In step one, the demographic variables that were correlated with the criterion (e.g., students age, home region, and host language skills) were entered, while in step two, social interaction (quantity and quality) and social connectedness were entered as predictors of each cross-cultural dimension. Potential multicollinearity was investigated, using tolerance and the variance inflation factor (VIF) (Cohen & Cohen, 1983). The values for the tolerance were all close to one, and the maximum VIF obtained in all regression models was far below the reference point of 10, which suggest that multicollinearity was not a problem (Cohen & Cohen, 1983). Table 4 presents the results of these multiple regressions.

Table 3: Means, Standard Deviations, and Correlations for All Variables

Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11	12
1 Adjustment 26	1.09	1.15												
2 Work environment	0.95	1.45	0.80**											
3 Language	1.01	2.14	0.64**	0.33**										
4 Study or task characteristics	1.37	2.04	0.61**	0.55**	0.20**									
5 Leisure time	1.84	1.82	0.67**	0.44**	0.33**	0.30**								
6 Urbanity	0.61	1.75	0.38**	0.27**	-0.09	0.24**	0.22							
7 Living quarters	1.00	2.12	0.55**	0.35**	0.21**	0.35**	0.36**	0.18**						
8 Local friendships	1.38	2.24	0.58**	0.35**	0.38**	0.18**	0.38**	0.10	0.23**					
9 Contact to those left behind	0.91	2.19	0.44**	0.24**	0.07	0.28**	0.23**	0.20**	0.27**	0.22**				
10 Host social interaction (quantity)	0.78	1.09	0.34**	0.36**	0.21**	0.13	0.23**	0.07	0.08	0.35**	0.04	(0.85)		
11 Host social interaction (quality)	3.83	0.85	0.34**	0.36**	0.21**	0.13	0.23**	0.07	0.08	0.35**	0.06	0.51**	(0.81)	
12 Host connectedness	3.95	1.15	0.46**	0.46**	0.26**	0.19**	0.36**	0.12	0.12	0.46**	0.08	0.68**	0.58**	(0.91)

Notes: $n = 175-189$; two-tailed Significant at * $p < 0.05$, ** $p < 0.01$ /Cronbach's alpha estimates in parentheses, along main diagonal.

Table 4: Multiple Stepwise Regressions of the Hypothesized Relationships between Host Social Interaction (Quantity and Quality) and Host Connectedness and the Dimensions of Adjustment

Predictors	Adjustment-26 item		Work environment		Language		Study or task characteristics		Leisure time		Urbanity		Living quarters		Local friendships		Contact to those left behind	
	Step 1	2	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2	Step 1	Step 2
Intercept	0.78**	-1.01***	-1.44***	-2.36***	-0.22	-1.97**	2.03**	0.62	1.34***	-0.81	1.51***	0.59	-2.26**	-2.79**	0.5	-2.84*	1.34	0.81
Step 1-Control variables																		
Age																		
Home region (0 = Non-EU)																		
Host language skills (0 = No)	0.16**	0.14**		0.36***		0.35***		-0.94**	0.17*	0.15**		-0.32**	0.25***		0.20**	0.15**		
Step 2-Predictors																		
Host social interaction (quantity)																		
Host social interaction (quality)			0.239*															
Host connectedness		0.46***		0.33**		0.24**		0.38**		0.35**		0.17**						0.46**
Overall F	4.63*	27.35***	50.30***	30.55**	26.18***	20.30***	5.08***	6.87**	5.10*	15.52***	17.19***	11.44***	11.37***	7.95***	7.49**	28.72***	2.76*	1.76
R ²	0.03	0.24	0.23	0.26	0.13	0.19	0.03	0.07	0.03	0.03	0.09	0.09	0.06	0.09	0.04	0.25	0.05	0.06
Adjusted R ²	0.02	0.23	0.22	0.25	0.13	0.18	0.02	0.06	0.02	0.14	0.09	0.11	0.09	0.07	0.04	0.24	0.03	0.03
Changein R ²	w	0.21	0.23	0.23	0.04	0.06	0.03	0.04	0.03	0.12	0.09	0.03	0.06	0.02	0.04	0.21	0.05	0.01

Notes: Significant at: * $p < .05$, ** $p < .01$, *** $p < .001$; standardized β coefficients are reported after Z-score transformation, $n = 189$. Because gender and host region are not significantly correlated with the criterion, they have not entered into the regression analysis.

As shown, host social interaction (in quality) is a positive predictor of students' adjustment to the work environment ($F = 30.55$; $p < 0.001$). Self-reported host connectedness is a positive predictor of students' adjustment ($F = 27.35$; $p < 0.001$) as well as of the remaining social facets. As expected, social interaction and social connectedness are not predictors of the inanimate facets of students' adjustment, such as living quarters and contact to those left behind. Regarding urbanity, the results show that students' adjustment to this facet is easier among the EU-students ($\beta = -0.32$; $p < 0.001$), who reported higher host social connectedness than non-EU students ($\beta = 0.35$; $F = 11.44$; $p < 0.001$). Furthermore, no other demographic effects were observed, except for the dimension of living quarters, as its importance increases with students' age. However, the percentage of variance for this dimension that was accounted by age was small with a value of 4.7%. The pattern of these relationships suggests preliminary criterion-related validity evidence for the proposed 26-item student adjustment scale as well as some of the subscales (see Appendix 1 for the full list of items).

DISCUSSION

This study follows an alternative approach to conceptualizing and measuring the adjustment of international students and puts forward a preliminary test of a new scale drawn from Hippler et al.'s (2014) expatriate adjustment scale. First, the 35 items comprising the original scale for measuring expatriates' adjustment were rewritten and adapted to the HE context. Second, the answer scale accounted for the various facets of the students' environment by requiring an assessment of the importance and direction of the changes observed during the exchange period, as called by Gilbreath et al. (2011). This procedure conveys an alternative approach to the assessment of students' adjustment that stems from the assumptions that not all changes are equally important (Conroy & McCarthy, 2019). As shown, a final 26-item and 8-factor solution accounts for international students' adjustment and portrays the changes encountered in the new environment. As expected, host social interaction and connectedness are antecedents of the 'social' facets of the adapted scale (e.g., language, local friendships, or leisure time), but are not related to the facets of urbanity and the living quarters, which is consistent with earlier findings with international students (e.g., Duru & Poyrazli, 2011; Yeh & Inose, 2003; Zhang & Goodson, 2011a, 2011b) and supports the scale validity. Furthermore, the findings identify the dimensions of adjustment that were more challenging for international students, consisting of keeping contact with home family and friends and host urbanity (i.e., environmental pollution, street traffic, and people punctuality). Host language, which was not a specific pressure point for the surveyed students predicted their cross-cultural adjustment. This contradicts previous reports (Jing et al., 2020) but highlights the power European languages can have in attracting international students (Mikulas & Jitka, 2019).

The contributions of this study have to be interpreted bearing its limitations in mind. First, we relied on self-report data which incur the risk of same-source bias. Following Podsakoff et al. (2003), we followed several recommendations to

reduce the sources of common-method variance, such as (a) assuring respondents anonymity and informing that there were no ‘right’ or ‘wrong’ answers; (b) randomizing the questions order; (c) using different response formats; (d) pilot testing the survey to avoid unclear and suggestive items and decrease social desirability. Finally, we used the single-common-method-factor approach to statistically control for method biases. As shown, the factor analyses confirmed the underlying constructs and the independence of the variables, which supports our theoretical approach.

Second, the sample includes international students from different origins and locations, but European countries are over-represented, accounting for 74.9% of all home countries and 98.3% of all destination countries. Given that the Erasmus mobility program in the context of the Bologna process has contributed to increase students’ mobility as well as decrease academic differences (Papatsiba, 2006), the findings confirm that European students are now more aware of and receptive to lifestyle differences (Lesjak et al., 2015; OECD, 2019) compared with students from other world regions (Zhou & Todman, 2008) and are less likely to experience acculturative stress (Yeh & Inose, 2003). These features observed among European international students might account for the high levels of adjustment observed in this study. However, as no significant adjustment differences were observed according to students’ demographics, including students’ home and host location, we trust this adjustment scale may prove useful in other international settings.

Finally, another limitation of the study regards the reliability levels of some adjustment factors that were slightly below .70. As a result, the conclusions regarding these dimensions (e.g., study/task characteristics, urbanity, living quarters) must be analyzed with caution although our results would be more conservative since we found significant results with a low reliability. Future studies are needed to further examine the reliability of these measures with other international students’ samples.

Implications for Future Research

This study puts forward a new instrument to assess the multidimensionality of international students’ adjustment, bearing in mind that not all changes are unpleasant or equally important. The findings confirm most students experienced relevant and positive changes once they arrive at destination, which provides empirical evidence of the internal consistency of the subscales used, as well as preliminary criterion-related validity. Given its limitations, future research may extend its contributions by drawing on other samples of international students outside the EU and further examining the convergent and divergent validity of this scale by investigating the relationships with other theoretically related constructs such as cultural competence, stress, anxiety, psychological well-being, and satisfaction. The findings of this study also encourage more research on the main coping strategies and coping skills that international students use, notably those related to fostering host interaction and connectedness. While we have controlled for the time spent abroad by inquiring all respondents within the first

weeks of mobility, future research may usefully employ an experimental design to measure adjustment variations throughout students' international stay.

Finally, this study highlights the importance of the host language for international students. As shown, knowing the host language is a positive antecedent of international students' adjustment within the EU, even when English is the instruction language. The importance of second-language acquisition has been reported before (Abdullah et al., 2014; Jing et al., 2020); however, less is known about the experiences of international students coming from and going to different countries, where English is not widely spoken. Such non-English-speaking contexts are ideal to advance our understanding of international students, including how language skills are relevant and can promote international students' intercultural competence.

Managerial Implications

This study offers a new approach for assessing the multidimensionality of international students' adjustment, that relies on P–E fit. Fit information can result in a better match between higher education institutions and students aiming to faster international mobility. As shown, not every host environmental facet is of equal importance to every individual nor inherently difficult. Therefore, the use of this adapted scale to assess international students' adjustment will enable HE institutions, notably counsellors and support services, to assess international students' level of preparedness (Brutt-Griffler et al., 2020) and cross-cultural adjustment that goes beyond study/task characteristics, thus identifying critical issues and taking remedial actions to avoid adjustment difficulties affecting academic performance and personal well-being. As shown, and even within Europe, where distances and stays are shorter (Mikulas & Jitka, 2019), international students can experience concerns about keeping contact with home family and friends, which emphasizes the need of continuing home support. Being able to pinpoint the key concerns of each student, early in the exchange program, may allow HE managers to proactively intervene as needed. Moreover, the refinement of this tool in the HE context will allow for the use of a common, yet tailored, metric for both the incoming and outgoing institutions that might help introduce timely and effective supporting practices.

The findings of this research also have practical implications to international students. First, this study provides a self-assessment tool that students can use to diagnose the dimensions they consider important to adjust abroad. Second, as students' cross-cultural adjustment is furthered by more and better interactions with host nationals and by host connectedness, HE institutions and international students may foster the engagement in host activities intended to promote the immersion in the local community and increase the sense of belongingness. Third, better fit also result from contact with those left behind, which includes students' family and friends. Thus, keeping contact with friends and relatives at home remains important to international students' adjustment in the destination. This is an issue that has been largely neglected in the literature, so further research down

this line may consider how to design support systems geared toward students' engagement with home relatives and friends.

CONCLUSION

By addressing a number of concerns pertaining to the measurement of international student adjustment, this study aims to establish a new scale that can be meaningfully used in the higher education context and applied with international student populations. We anchored students' adjustment in the person–environment fit literature and offered a multidimensional instrument that takes account of the level of importance that international students place on various aspects of the host environment. The adapted scale includes eight different adjustment domains: work/academic environment, language, study or task characteristics, leisure time, urbanity, living quarters, local friends, and contact to those left behind. Criterion-related validity indicated positive associations between social interaction and social connectedness with host nationals and international students' adjustment, which highlights the importance of social interaction at destination. Although our new instrument provides a way forward to deal with the weaknesses in past approaches to measuring international students' adjustment, further research is required to replicate and validate its multidimensionality and prevent the outcomes of a poor adjustment.

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HONOR NOTE

This paper honors Thomas Hippler's academic work on cross-cultural adjustment. Sadly, Thomas passed away in November 2018. True to his passion for research, we went on with this work until publication. The international students' adjustment scale is now available to the research community, including higher education institutions, advisory centers, academics, students, and families. Those less familiar with the contributions of Thomas Hippler may find inspiration here: A tribute to Thomas Hippler (1972–2018). <https://harzing.com/blog/2019/02/a-tribute-to-thomas-hippler-1972-2018>.

NOTE

Appendices for this article can be found on the JIS website at <https://www.ojed.org/index.php/jis>.

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