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Learning Approaches: Cross-Cultural Differences (Spain–Argentina) and Academic Achievement in College Students

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Abstract. Learning approaches describe the students' degree of cognitive commitment to learning in diverse types of academic tasks and educational environments. Even though from a micro-level perspective different profiles of approaches have been identified in high-achievement undergraduates attending several majors, such profiles have not been examined from a macro-level approach in terms of distinct educational cultures. Therefore, the research involved two studies conducted on undergraduates from Argentina and Spain: The first one was aimed at analyzing the psychometric features of the Approaches and Study Skills Inventory for Students (ASSIST) whereas the second was focused on examining the learning approaches profiles of high and low achievers attending the same major (Psychology) in two different educational cultures (Spain and Argentina). The scale's original internal structure, examined on a sample of 400 participants (50% Spanish), was verified except for one item, which was fatherly eliminated. The resulting structure was tested and proven verified in a new sample (N = 1,334; 58.3% Spanish) by confirmatory factor analysis, factorial invariance, and internal consistency studies. External validity evidence was examined as well. Additionally, norms to be used in the professional field were calculated.

Profiles of learning approaches by academic achievement from each country were examined by latent class analysis. In both cases, high achievers reported higher and more frequent use of the Deep and Strategic approaches and lower and less frequent usage of the Surface one. Further studies should replicate these analyses in undergraduates attending other majors in order to test the hypothesis sustaining these findings' generalization.

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Learning Approaches

The expression *learning approaches* was coined by Marton and Säljö (1976). Such a notion describes the students' cognitive commitment to learning which relies on the type of activity and the academic environment; the latter can boost learning processes as well as learning strategies, even when they could pursue opposite goals: Either the significant and long-term acquisition and integration of knowledge or the memorization and the information's automatic reproduction (Biggs, 1999/2005).

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Research on learning approaches—Student Approaches to Learning, SAL—started in the 1970s, and focused on understanding how that variable interacted with the educational environment. To do so, researchers conducted an experiment examining different types of learning deployed by students when dealing with a unique academic task. The research problem was to describe how the same learning content was comprehended by different individuals in different ways. Thus, participants were exposed to ideas and principles presented in texts, and the object to be analyzed was the way in which information was perceived and processed, namely learning approaches (Marton & Säljö, 1976). As a result of the experiment, two learning approaches were identified, labeled Deep and Surface according to the observed student´s degree of engagement and cognitive effort.

In short, high-achievement students dealt with materials intending to understand their meaning and implications—Deep-level processing—, due to their high engagement with learning. Conversely, undergraduates exhibit low engagement with learning processed information by heart; recalling and reproducing it afterward without investing any effort in its comprehension—surface-level processing. Such dynamics prevented them from achieving satisfactory academic results.

Marton and Säljö's (1976) contributions were initially referred to as the processes involved in text comprehension and aimed at analyzing the specific meaning assigned to a particular text, principle, idea, and so on by a specific individual. As new findings were collected, studies were fatherly broadened by other authors, extending the notion of learning approaches to every learning academic situation. Moreover, not only the Deep and Surface approaches remained identified as an exclusive pair: A third type, named Achieving or Strategic was also added to the previous approaches (Biggs, 1979; Entwistle et al., 1979).

Each one of these three approaches is based on the students' self-perceptions regarding their beliefs on their ways of studying and learning (Romero-Medina et al., 2013). Such self-perceptions involve motives and meta-strategies employed in diverse learning situations.

The Deep approach stands out as it is related to intrinsic motivation: It entails a sound interest in understanding learning materials as well as integrating new information with long-term knowledge (Zhao & Qin, 2021). On the contrary, the Surface approach involves memorizing and recalling information as the preferred way of learning, guided by extrinsic motivation (Cheung et al., 2022). The Strategic approach would represent an intermediate position that leads students to adapt their behaviors to the requirements of the specific learning situation, either comprehending or memorizing content thus enhancing academic performance. Being strategic implies planning how to use the proper skills and strategies as a result of a realistic perception of the evaluation requirements (Entwistle, 2001). This approach has been also named *organized studying* in more recent research (Asikainen & Katajavuori, 2022; Lindblom-Ylänne et al., 2019). Such expression emphasizes the role of self-regulated learning linked to planning, time management, and industry (Parpala et al., 2021).

It is worth mentioning that, even though in general terms it is understood that some of the approaches predominate over the rest of them, expecting mixed profiles with more than one approach standing out is also feasible (Alsayed et al., 2021).

Studies have verified the association between academic achievement and learning approaches: Whilst it resulted positive for the Deep and Strategic types, it was found negative for the Surface one (Biggs et al., 2001; De la Fuente et al., 2020; Sam, 2020; Zamora-Menéndez et al., 2020).

Learning Approaches and Educative Context

It is important to highlight that learning approaches let to assess teaching environments indirectly since the students' motivation and strategies depend, to a great extent, on teaching and evaluation methods (Takase et al., 2019). So, using a Deep approach seems more likely in less regulated learning environments which, concurrently, promote evaluation methods requiring conceptual understanding and integration. Contrariwise, more regulated environments suit students preferring the Surface approach. They are prone to invest less time in learning. Consequently, they deal with high amounts of information without prioritizing understanding. This explains why they prefer multiple-choice tests (Biggs & Tang, 2011; Gandía Herrero & Romero Medina, 2019). Distinctively, the Strategic approach—organized studying—is suitable to be used in any kind of learning environment; when combined with either the Deep or the Surface, it enables a better academic performance (Entwistle, 2001).

Educational environments—involving teaching and evaluation methods—arise as a matter of interest in view of their influence on learning approaches. Hence, diverse types of environments have been taken into consideration by researchers, according to their different levels of proximity to students—i.e., each educational centre's teaching context, the educational environment of each country, and the specific culture corresponding to each national identity. Dennehy (2015) has drawn attention to cultural differences across

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nations, underlining their distinctive educational cultures, which entail a wide variety of educational styles and educational history, actualized by means of different teaching methods as well as differences in the resources and procedures implemented by educational organizations.

Some studies reported statistically significant differences in learning approaches by country, and those differences were even more significant when distinguishing Western heritage from Asian countries (Dennehy, 2015; Niles, 1995). These results drive to describe distinct ways of interaction between the educational context and learning processes occurring in different educational cultures.

Present Study

Up to date, studies on learning approaches involve two major subjects deserving to be mentioned. On the one hand, instruments to assess the construct have been developed. Two widely used scales are available to be used in college students: The Revised Two Factor Study Process Questionnaire (R–SPQ–2F; Biggs et al., 2001), and the Approaches and Study Skills Inventory for Students (ASSIST; Tait et al., 1998). The former measures only Deep and Surface approaches whereas the latter includes the measurement of the Strategic as well.

On the other hand, learning approaches have been analyzed from a micro-level perspective in different countries, identifying profiles of approaches in students from different majors in terms of their associations with academic performance (Bansal et al., 2021; Freiberg-Hoffmann et al., 2017; Smarandache et al., 2022). Moreover, a thorough review of the literature of interest conducted on several databases—i.e., Elsevier, Springer, Taylor & Francis, APA PsycNET, Wiley—suggested that profiles have not been examined from a macro-level standpoint, taking into consideration each country´s educational culture. Bearing that in mind, this study was aimed at examining the influence of the cultural educational context on learning approaches profiles exhibited by undergraduates. Such analysis acquires importance in view that it has not been conducted before: It comprises the comparison between two Spanish speaker countries, one from Europe and the other from Latin America, specifically Spain and Argentina. Therefore, pointing out the main differences between the educative contexts that may have an impact on college students learning approaches in both regions appear relevant. For instance, whilst most Latin American countries assign on average between 2.5% and 3.5% of their gross domestic product to the educative system, the Organization for Economic Co-operation and Development (OECD) member countries allocate 4.5%. This not only does affect teachers' salaries but also the investment in Information and Communications Technology (ICT) and educational facilities. Investment in Investigation and Development (I+D) projects as well as academic mobility are also lower in Latin America. The latter is due to the scarce number of students applying for fellowships (2%) in comparison with their counterparts in Western Europe, the United States of America, Australia, and Canada (70%). Such a difference in percentages results in a brain drain in Latin American countries (López-Segrera, 2016). When specifically comparing the educative contexts, the gross attendance ratio in college is higher in Argentina (78.2%) than in Spain (65.1%). That can be partly explained by the admission systems in force: Whereas in Argentina all students can provisionally attend classes up to the time when they have to pass several courses to be finally admitted, Spain previews a limited admission according to the number of places available, selecting students by considering Grade Point Average (GPA) and an exam. Such difference entails more students in class—Argentina higher than Spain. That logically restricts teaching methods. Gender differences are reported as well: Spain shows 54% of women in higher education whereas Argentina reports 62% (García de Fanelli, 2018; Motes & Osorio, 2020).

On the grounds of the distinctions above described, comparing psychological variables acquires importance, resulting in several cross-cultural studies analyzing such constructs in undergraduates from different countries. Their findings offered major information on the similarities and differences in the students' profiles and on the internal structures of the tests used in each country (Freiberg-Hoffmann et al., 2022; Martínez-Fernández & Vermunt, 2013; Pastor Seller et al., 2019).

Regarding the existing theoretical and empirical background, it was examined whether high academic achievement profiles correspond to higher scores for Deep and Strategic approaches, and low scores for the Surface one. Thus, the goals for two separate studies were as follows: (a) Analyzing psychometric features of the ASSIST—which measures learning approaches—in terms of its internal structure, internal consistency, factorial invariance, external validity evidence as well as the dimensions' scores and norms for samples composed of Psychology undergraduates from both countries; and, (b) analyzing and comparing learning approaches profiles in high and low performing Psychology students from both academic contexts—Spain and Argentina.

In order to bring clarity, the two studies were fully described separately—method, results, and discussion.

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Study 1: ASSIST Questionnaire Psychometric Features

Method

Participants

The exploratory factor analysis and internal consistency study was conducted on a sample composed of 400 Psychology undergraduates (50% Argentina, 50% Spain;18.1% males, 81.9% females) between 18 and 51 years old (M_{age} = 21.66; *SD* = 5). The ages of the Argentinean group were between 18 and 50 years old (M_{age} = 21.94; *SD* = 5.04; 21.2% males, 78.8% females). In the Spanish group, ages ranged from 18 to 51 (M_{age} = 21.40; *SD* = 4.97; 15% males, 85% females).

The sample used for the confirmatory factor analysis, the factorial invariance analysis, and the comparison of internal consistency indices was composed of 1,334 Psychology undergraduates (33.4% males, 66.6% females) from 18 to 61 years old (M_{age} = 21.73; *SD* = 4.97). 41.7% of them were from Argentina (47.8% males, 52.2% females), with ages between 18 and 56 years old (M_{age} = 22.7; *SD* = 5.10) whereas 58.3% were Spanish (23.2% males, 76.8% females) from 18 to 61 years old (M_{age} = 21.01; *SD* = 4.76).

Instruments

The Spanish translation by Hidalgo-Montesinos et al. (2009) of the Approaches and Study Skills Inventory for Students (ASSIST; Tait et al., 1998) was employed. It is composed of 18 statements responded to by a 5-option Likert scale. Three scales represent the approaches: Deep approach—Items 2, 6, 10, 12, 15, 17—, Surface—Items 1, 4, 8, 14, 16, 18—, and Strategic—Items 3, 5, 7, 9, 11, 13.

Each country gathered additional sociodemographic and academic information such as gender, age, grade point average, number of passed courses, and years that went by from college admission. The two latter variables were used to estimate an indicator of academic achievement.

Procedures

In both studies and in both countries, measures were taken in group sessions conducted in class. Participants volunteered and signed an informed consent where the study goals were explained. The anonymity was also notified and thoroughly preserved. Participant universities—Murcia and Buenos Aires—endorsed the study, allowed by their ethics committees.

Data Analysis

To perform the exploratory factor analysis, a parallel analysis according to Horn, and the minimum rank factor analysis were calculated in order to determine the number of factors to be retained. Results from the 95th percentile and higher were taken into consideration (Lim & Jahng, 2019). Then, an exploratory factor analysis with oblimin direct and Kaiser normalization was run. Items with loadings of .40 or higher in a unique factor and factorial simplicity indices higher than .50 were retained (Fleming & Merino-Soto, 2005).

The internal consistency was estimated by ordinal alpha coefficients.

Framed on the confirmatory factor analysis step, the resulting model was tested in terms of fit and was also compared with the fit of the model posed by the scale's authors. To do so, the robust maximum likelihood method (RML), recommended for ordinal variables was employed (Kiliç & Doğan, 2021). The models' fit was tested using the normed fit index (NFI), non-normed fit index (NNFI), and comparative fit index (CFI), taking values over .90 as acceptable. Root mean square error of approximation (RMSEA) indices (RMSEA) and standardized root-mean-square residual (SRMR) were employed as well, assuming values below.08 as adequate. The model parsimony was tested by the consistent Akaike information criterion (CAIC), with lower coefficients indicating a better fit and parsimony (Wang & Wang, 2020).

The factorial invariance analysis used country, gender, and age as split variables. As for age, students were divided into two groups using the median as the cut-off point (20 years) since it is a statistical indicator non-sensitive to extreme values. Those groups were: Younger students (18 to 20 years old) and older undergraduates (21 to 61). The weighted least squares (WLS) method was employed since it is suitable to compare estimations between large samples, a low number of latent and observed variables, and items with multiple categories (Liu et al., 2017). Three nested models with different restriction levels were tested. The invariance was interpreted with CFI and RMSEA indices since they are not sensitive to the sample size (van Zyl & ten Klooster, 2022). Moreover, those two indices are recommended for analyses with samples of different sizes and ordinal variables (Rojas Torres et al., 2018). Ordinal alphas were calculated for each country and compared via the Feldt formula (Feldt et al., 1987).

Academic achievement was the criterion variable used for the predictive validity evidence analysis. Since data related to this variable were gathered differently in both countries, they were analyzed separately. The grade point average reported by the students was used in the Spanish group. The *ratio* between the number of passed courses and the years that went by from college admission was calculated as an estimator in the case of Argentina. Both measures were

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suggested as valid for analyzing academic achievement (Rodríguez-Ayán & Ruiz-Díaz, 2011; Ruiz et al., 2007). As for measuring learning approaches, the summated rating method was used: it is the addition of each response to the items in order to calculate the scales' total score (American Psychological Association, 2015).

Regarding norms, a scores' mean-differences analysis between countries was run for the three dimensions of the scale as a first step. Later, scores were grouped by tertiles—High, Medium, Low—for each dimension—Deep, Surface, Strategic—and country.

Factor 10.9 (Lorenzo-Seva & Ferrando, 2019) and SIMLOAD (Fleming & Merino-Soto, 2005) were the statistical software packages used to calculate the exploratory factor analysis. LISREL 8.8 was employed for the confirmatory factor and the factorial invariance analyses. Ordinal alpha coefficients were compared via the AlphaTest package (Merino-Soto & Lautenschlager, 2003). The mean differences analysis and the norms calculation were conducted with SPSS 21.

Results

Exploratory Factor Analysis

The parallel analysis suggested the extraction of three factors. Therefore, three latent variables were isolated in the exploratory factor analysis. Only Item #11 was eliminated. So, the model retained 17 out of the 18 analyzed items, explaining 68.4% of the common variance. Every factor explained similar percentages of variance, also obtaining optimal internal consistency indicators (see Table 1).

Confirmatory Factor Analysis

The 3-factor resulting model was examined by confirmatory factor analysis (see Figure 1) and compared with the original theoretical model.

Table 1. *ASSIST. Exploratory Factor Analysis*

	Approaches				
Item	Deep	Surface	Strategic	ISF	Communality
ASSIST2	.547	–.372	.155	.519	.530
ASSIST6	.674	–.090	.187	.871	.725
ASSIST10	.629	–.266	.339	.525	.688
ASSIST12	.732	–.248	.106	.824	.768
ASSIST15	.709	–.318	.013	.762	.631
ASSIST17	.557	–.176	.227	.686	.482
ASSIST1	.118	.409	–.068	.851	.515
ASSIST4	–.244	.500	–.213	.558	.623
ASSIST8	–.189	.584	–.109	.818	.476
ASSIST14	.172	.480	–.090	.792	.462
ASSIST16	.213	.548	.074	.789	.665
ASSIST18	–.171	.736	–.117	.890	.708
ASSIST3	–.023	–.087	.741	.978	.664
ASSIST5	.287	–.090	.443	.572	.554
ASSIST7	.224	–.272	.524	.535	.469
ASSIST9	.204	–.202	.833	.841	.848
ASSIST13	.150	–.191	.619	.800	.606
σ	26.2	20.7	21.5		
H-Latent	.835	.800	.833		
H-Observed	.863	.838	.824		
FDI	.943	.927	.949		
Ordinal alpha	.890	.859	.900		
SR	2.841	2.469	3.008		
EPTD	92%	90.7%	92.5%		
	Deep	Surface	Strategic		
Deep	–	–	–		
Surface	–.311	–	–		
Strategic	.145	–.200	–		

Note. FDI = factor determinacy index; SR = sensitivity ratio; EPTD = expected percentage of true differences.

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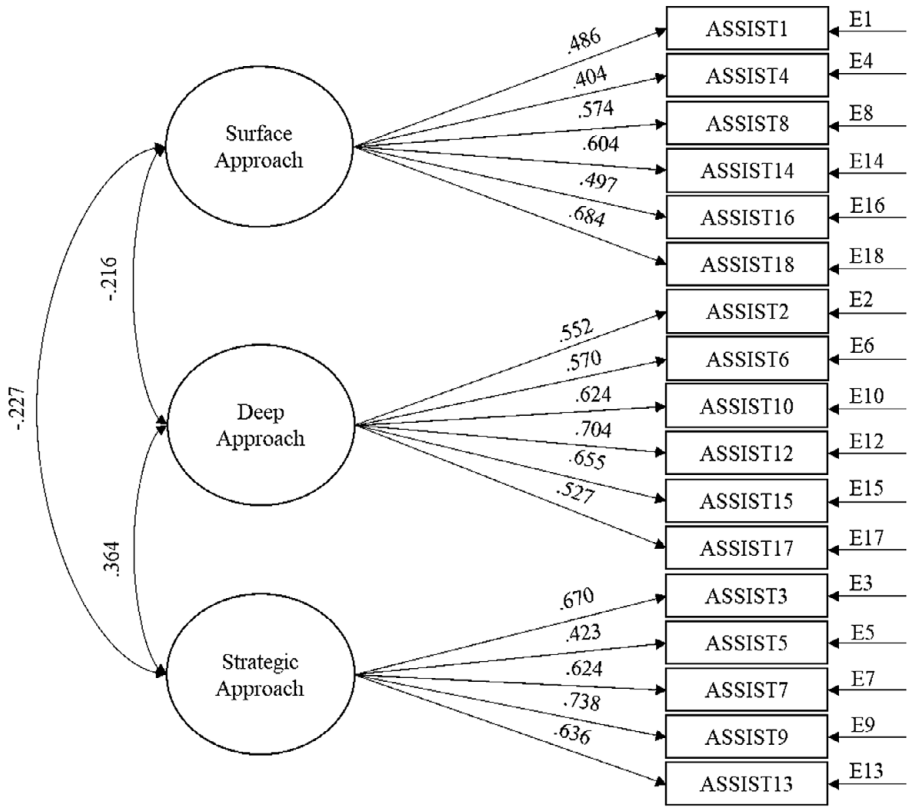

Figure 1. ASSIST. *3-Factor resulting Model.*

Table 2. *ASSIST. Model Fit and Model Comparison (Resulting vs. Original)*

					95% CI for RMSEA			
	NFI	NNFI	CFI	RMSEA	*LL*	*UL*	SRMR	CAIC
ASSIST (without Item 11)	.908	.906	.920	.068	.063	072	.078	9214.440
ASSIST (with Item 11)	.905	.903	.916	.069	.065	.073	.081	10399.461

Both models achieved adequate fit indices (see Table 2). NFI, NNFI, and CFI indices were higher than .90 for both models whereas RMSEA was lower than .08. SRMR reached an adequate value for the model which excluded item 11 whereas it was slightly higher than .08 for the model including item 11; that implied a better fit for the former model. As for CAIC coefficients, the resulting model got a lower value, indicating its higher parsimony when compared with its theoretical rival.

The above-mentioned coefficients pointed out the superiority of the resulting model over the theoretically hypothesized. Accordingly, the following analyses were conducted exclusively on the former.

Factorial Invariance Analysis

The factorial invariance of the resulting model was tested by comparing samples split by country, gender, and age. Different restriction levels were applied (configural, metric, scale). Results verified the model´s invariance for all the constriction levels taken into consideration (configural, metric, scale) and for every segmentation (country, gender, and age) (see Table 3). When comparing CFI and RMSEA indices obtained for the least restricted model with those found for the more constrained models, differences were non-significant. Such a result favors the hypothesis stating the metric invariance of the scale in the two samples compared in the study.

Comparison of Internal Consistency Indices

Internal consistency indices for the Spanish and the Argentinean samples were optimal and did not verify statistically significant differences ($p > .01$) (see Table 4).

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Table 3. *ASSIST. Factorial Invariance Analysis*

Model	RMSEA	90% CI for RMSEA		ΔRMSEA	CFI	Δ CFI
		LL	*UL*			
Country						
Configural	.055	.051	060	–	.949	–
Metric (weak)	.058	.053	.062	–.003	.942	.007
Scale (strong)	.059	.054	.063	–.004	.939	.01
Gender						
Configural	.065	.060	069	–	.930	–
Metric (weak)	.065	.061	.070	.000	.924	.006
Scale (strong)	.067	.062	.071	–.002	.920	.01
Age						
Configural	.058	.054	.063	–	.943	–
Metric (weak)	.058	.054	.063	.000	.940	.003
Scale (strong)	.059	.055	.064	–.001	.937	.006

Table 4. *ASSIST. Internal Consistency for Dimensions. Argentina vs. Spain Comparison*

Learning approaches	Argentina	Spain	χ^2	*df*	*p*	*q*
Deep						
Ordinal alpha 95% CI	.856 [.837, .874]	.840 [.822, .857]				
M	21.262	21.778	1.274	1	.258	.057
SD	3.297	3.717				
Surface						
Ordinal alpha 95% CI	.816 [.791, .839]	.854 [.837, .869]				
M	15.852	17.234	6.247	1	.012	.126
SD	3.933	4.103				
Strategic						
Ordinal alpha 95% CI	.820 [.795, .843]	.812 [.790-.832]				
M	18.205	19.287	.203	1	.652	.024
SD	3.565	3.349				

Such a finding implies an equivalent homogeneity level of the items composing each dimension for both countries.

Predictive Validity Evidence Analysis regarding Academic Achievement

The influence of learning approaches on academic achievement was analyzed in both countries' samples. The Spanish sample verified the significant influence of all approaches, positive for Deep and Strategic, and negative for the Surface one. A significant effect for the Strategic and Surface approaches was found in the Argentinean sample—proven positive for the former and negative for the latter (see Table 5). The Strategic approach is the one that contributes to explaining academic achievement with the highest percentage of variance in both countries.

The equivalence of scores by country was tested in order to make a decision on the pertinence of calculating separate norms. Scores differed significantly for the three scales, and the Spanish sample obtained higher scores every time. Thus, separate norms were required (see Table 6).

As above mentioned, data were split into tertiles, classifying the approaches scores as Low, Medium, and High (Table 7).

Discussion

This first study has been developed to analyze the ASSIST's psychometric features in college students from Spain and Argentina, therefore guaranteeing its proper functioning in both populations. Results are examined below.

Analyzing the ASSIST´s internal structure in the whole sample was the first step. The parallel analysis

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Table 5. *Regression Models for Learning Approaches and Academic Achievement by Country*

Country, Model	B	95% CI	*SE*	β	*t*	*p*
Spain						
(Constant)	5.640	[5.070, 6.207]	.289	-	19.522	.000
Surface	–.023	[–.039, –.007]	.008	–.100	–2.857	.004
Deep	.027	[.009, .045]	.009	.106	2.901	.004
Strategic	.052	[.032, .072]	.010	.185	5.051	.000
Argentina						
(Constant)	2.975	[1.965, 3.984]	.514	–	5.787	.000
Surface	–.033	[–.065, –.002]	.016	–.090	–2.104	.036
Deep	–.004	[–.036, .028]	.016	–.010	–.230	.818
Strategic	.060	[.025, .096]	.018	.148	3.327	.001

Table 6. *Differences in approaches by Country*

Country	Deep	Surface	Strategic
Argentina (n = 557)			
M	21.262	15.852	18.205
SD	3.927	3.933	3.565
Spain (n = 777)			
M	21.778	17.234	19.287
SD	3.717	4.103	3.349
Levenne			
F	.726	3.081	2.179
p	.394	.079	.140
t	2.439	6.167	5.661
p	.015	.000	.000
d	.134	.343	.312

Table 7. *ASSIST. Norms for Argentina and Spain*

	Level		
Learning Approach	Low	Medium	High
Argentina			
Surface	< 15	15–17	> 17
Deep	< 21	21–23	> 23
Strategic	< 18	18–20	> 20
Spain			
Surface	< 16	16–19	> 19
Deep	< 21	21–23	> 23
Strategic	< 19	19–21	> 21

suggested extracting three factors, and that was consistent with the original theoretical model (Tait et al., 1998). Such 3-factor model, isolated in the exploratory factor analysis, explained 68.4% of the common variance. It retained all the items except for one, #11. Its malfunctioning could be due to it was the unique negative statement in the original version—"I don't find it at all difficult to motivate myself". Standards in psychometrics recommend avoiding negative clauses since they usually introduce confusion, thus distorting responses (Pais et al., 2016; Pham et al., 2018). The remaining items obtained loadings and factorial simplicity indices indicating their high representativity and exclusivity regarding the factor they loaded on (Boateng et al., 2018).

Additionally, the H replicability indices, higher than .80, indicated that those retained items represented factors properly.

Consequently, it is assumed that the latent variables were accurately defined; hence, it is likely for them to be replicated in further studies (Ferrando & Lorenzo-Seva, 2018).

Factor determinacy index (FDI), higher than .90, marginal reliability indices higher than .80, sensitivity ratio (SR) higher than 2, and expected percentage of true differences (EPTD) higher than 90% drive to state that the scale is suitable to be employed in the professional field (Ferrando & Lorenzo-Seva, 2018).

The low inter-factorial loadings lead to asserting the parsimony of the structure. Given their independence, each factor explains different aspects of the concept, avoiding redundant information (Watkins, 2018).

The comparison between the original theoretical model and the one resulting from the exploratory factor analysis confirmed the better fit and parsimony of the latter.

The metric invariance of the resulting model was verified not only by country but also by gender and age, generalizing its stability across countries—Spain and Argentina—, genders, and age groups; which guarantees unbiased measures (Davidov et al., 2018).

Regarding the scores' internal consistency, optimal indices were achieved for the three dimensions in both countries. Such indices were compared by country, without verifying significant differences; the effect sizes were nil or small (Cohen, 1988).

The predictive validity evidence analysis, using academic achievement as a criterion, verified the positive influence of the Strategic approach and the negative

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influence of the Surface approach on achievement. The Deep approach only explained academic performance in the Spanish sample, with no significance in the Argentinean one. Both results run in line with findings from previous studies (Entwistle et al., 2013; Öhrstedt & Lindfors, 2018; Sam, 2020). It has been stated that the Deep approach solely is insufficient to predict academic achievement. The Strategic approach is also required. In other words, a proper conceptual understanding is not always enough to achieve a higher performance; the use of adequate study methods usually makes a substantial impact (Karagiannopoulou & Milienos, 2015).

Finally, the scores equivalence by country was examined. Significant differences were verified for every learning approach score. Therefore, they should be interpreted differently according to the country (American Educational Research Association [AERA], American Psychological Association [APA], & National Council on Measurement in Education [NCME], 2014). Consequently, separate norms were calculated. They can be useful for practitioners in the educational professional field who are interested in assessing learning approaches from Argentina or Spain by means of the ASSIST.

This study introduced a valid and reliable scale to assess learning approaches in undergraduates from Spain and Argentina. It is expected that educational psychologists will find it useful, regarding the extra benefit of regional norms enabling accurate interpretations according to the country.

Study 2: Learning Approaches Profiles in Low and High-Achievement undergraduates from Spain and Argentina

Method

Participants

The sample analyzed in the confirmatory factor study—Study 1—was also employed here. Thus, the same informed consent and the ethics committee endorsement apply.

Instruments

The version of ASSIST obtained in Study 1 was also used.

Procedures

In order to develop learning approaches profiles of Spanish and Argentinean low and high-performance undergraduates, categories corresponding to the three learning approaches dimensions resulting from Study 1 —High, Medium, Low—were employed. Besides, the samples were split by academic achievement into two categories—High and Low. These categorized variables were employed to test how the levels in the approaches entail profiles corresponding to academic success or academic failure. Following Altman (2014), tertiles were used in order to configure three categories of approaches, proceeding in the same way as for the norms; the median was employed to split the samples into halves by academic achievement. Then, a latent class analysis was conducted using the three dimensions of learning approaches and academic achievement. The Bayesian Information criteria (BIC), the sample size adjusted BIC (ssaBIC), and the Akaike information criteria (AIC) indices were employed to interpret the models fit; in all these cases, low values indicate a better fit. The Vuong-Lo-Mendel-Rubin (VLMR) and the Lo-Mendell-Rubin (LMR) statistics were also taken into consideration; significant values imply that models with a higher number of classes fit better (Petersen et al., 2019; Schreiber, 2017; Weller et al., 2020).

Data Analysis

The latent class analysis was run via the Mplus 7 software.

Results

The latent class analysis was conducted as follows: (a) The levels of the three separate learning approaches obtained in Study 1 were employed—High, Medium, Low—; (b) academic achievement was split into High and Low by the 50^{th} percentile. Models with 1, 2, and 3 classes were tested independently for both countries' samples.

The 2-class model obtained the best-fit indices for both countries (see Table 8). BIC and ssaBIC coefficients were the lowest. The AIC index was the lowest also for Argentina. However, the Spanish sample obtained lower values when compared to the 1-class model and higher when compared to the 3-class model. Nevertheless, the 2-class model was judged as suitable for both countries since BIC and ssaBIC are recommended as more precise indicators because they are adjusted according to the sample size. Furthermore, VLRM and LRT indices for the 2-class model verified a significant improvement ($p < .01$) when compared to the 3-class model. Finally, the 2-class model showed the highest theoretical consistency compared to the 1 and 3-class models. Therefore, the 2-class model was retained.

As for the 2-class model interpretation in the Spanish sample, both classes showed a similar size (50%). When analyzing the likelihood of response to the indicators of each latent variable, Class 1 grouped undergraduates with a low Surface approach and high use of both Deep and Strategic approaches as well as high academic

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Table 8. *Latent Class Analysis. Fit Indices*

Country, Class	LL	BIC	ssaBIC	AIC	VLRM	*p*	LMR	*p*
Argentina								
1	–1,466.13	2,973.68	2,951.47	2,946.26	–	–	–	–
2	–1,440.72	2,970.19	2,922.70	2,911.44	–1,466.13	.000	49.76	< .001
3	–1,436.63	3,009.33	2,936.36	2,919.26	–1,440.72	.503	8.01	.513
Spain								
1	–2,117.62	4,279.20	4,256.98	4,249.25	–	–	–	–
2	–2,067.32	4,228.82	4,181.20	4,164.64	–2,117.62	.000	98.64	< .001
3	–2,056.19	4,256.79	4,183.78	4,158.38	–2,067.32	.017	21.82	.019

Note. LL = Loglikelihood; BIC = Bayesian Information criteria; ssaBIC = sample size adjusted BIC; AIC = Akaike information criteria; VLRM = Vuong-Lo-Mendel-Rubin; LMR = Lo-Mendell-Rubin.

Table 9. *Learning Styles and Academic Achievement Class Analysis by Country*

	Most likely latent class membership			
	Spain		Argentina	
	Class 1	Class 2	Class 1	Class 2
Class	.500	.499	.581	.419
Surface				
Low	.506	.217	.457	.285
Medium	.290	.419	.305	.253
High	.204	.363	.238	.462
Deep				
Low	.170	.533	.257	.623
Medium	.280	.321	.345	.222
High	.551	.147	.398	.155
Strategic				
Low	.201	.561	.121	.830
Medium	.290	.382	.407	.163
High	.509	.057	.472	.007
Achievement				
Low	.293	.736	.429	.634
High	.707	.264	.571	.366

achievement. In opposition, Class 2 included undergraduates reporting a medium-high Surface approach, low use of Deep and Strategic approaches as well as low achievement (see Table 9).

Regarding the Argentinean sample, Class 1 (58.1%) comprised more individuals than Class 2 (41.9%). Concerning the likelihood of belonging to each class according to the type of responses, slight differences with the Spanish sample emerged. On that account, Class 1 joined students with low Surface approach, medium-high Deep and Strategic approaches, and high academic achievement. Class 2 was composed of undergraduates with a high Surface approach, low Deep and Strategic approaches, and low academic achievement (Table 9).

Discussion

Study 2 analyzed learning approaches and academic achievement profiles. In both groups of undergraduates—Spain and Argentina—, high academic achievement corresponded to the most frequent use of the Deep and Strategic approaches and the less frequent use of the Surface one. In opposition, a low academic achievement matched with more frequent usage of the Surface approach and less preference for both Deep and Strategic approaches. Not only the high-achievement but also the low-achievement profile matched with the ones reported in previous studies referred to Psychology undergraduates from different countries (De Santis, 2018; Öhrstedt & Lindfors, 2016).

When analyzing the above-reported findings in order to draw attention to the educational culture of each country, it is worthy to describe some differences between the Faculties of Psychology of Spain and Argentina examined in this research. Even though both are public, among the main differences the number of freshmen per year-term is rather different in the first place. Whilst in Spain admissions are limited depending on three application criteria—the students' Grade Point Average, an exam as well as the number of places available—, vacancies are unlimited in Argentina requiring passing several courses instead. That is the reason why the Argentinean higher-education system involves a higher number of students compared to the Spanish one. Besides, most Spanish undergraduates are full-time students. Conversely, most Argentinean students have a job,—either part-time or full-time—while attending their courses. Additionally, Spanish universities give plenty of support to students and teachers in terms of adequate facilities and resources whereas Argentinean universities give limited assistance either to teachers or to undergraduates.

However, despite the differences above described, findings lead to state that even in different educational cultures good achievement is equally linked to

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approaches and learning strategies of a Deep and Strategic type—organized studying. That implies undergraduates´ learning approaches profile in a specific major does not differ when analyzed from a macro-level perspective in two different educational cultures (Spain-Argentina).

Such a conclusion is similar to the one obtained in micro-level studies, identifying similar profiles in other majors and verifying the same features, no matter the undergraduate's gender, age, or other socio-demographic characteristics (Bansal et al., 2021; Chonkar et al., 2018; Joshi et al., 2021).

However, as previously stated, profiles remained stable in both countries despite the differences reported in Study 1. In other words, the high-achievers profile is similar in both cultures whereas the degree of preference to use each approach is rather different. As above mentioned, such a high-achievers profile was also found in other majors: That result would contribute to strengthening evidence favoring the hypothesis stating that high-achievers show higher use of the Deep and Strategic approaches and low use of the Surface approach. However, further analyses with larger and wider samples, including undergraduates from other majors and countries arise as mandatory in order to support such an assertion.

Taking into consideration the importance of fostering both Deep and Strategic learning approaches in undergraduates, several recommendations useful for teachers and students contained in the literature of interest are here presented. From the students' viewpoint, active participation by means of posing questions, reasoning analogically, designing concept maps, employing collaborative learning, using critical thinking, asking for feedback, and learning from exposition to the experience seems the most preferable way to reach successful learning. Boosting all those skills requires that the teacher promotes a class climate able to enhance trial and error learning, being benefitted from the peers' previous knowledge, planning group activities, using the teaching-learning Socratic method, giving proper feedback, using evaluation methods aimed at enabling reflective thinking and conceptual integration in undergraduates (Azer et al., 2013; Biggs & Tang, 2011; Gandía Herrero & Romero Medina, 2019).

The above-mentioned suggestions are only a few among all the possible actions that could be taken by teachers and students in order to achieve long-lasting and deep learning. In view of the differences between the Spanish and the Argentinean educational contexts, it is important to bear in mind that such actions are not to be taken all at once but according to diverse factors such as institutional resources, type of major, and number of students per class among others.

General Discussion

To sum up, a cross-cultural study focused on learning and study approaches used by Psychology undergraduates compared two higher education national cultures—one European—Spain—and the other, Latin American—Argentina.

Study 1

Study 1 obtained a version of the Approaches and Study Skills Inventory for Students (ASSIST) suitable to be used in individual assessments of learning approaches in higher education, either in Spain or Argentina. The psychometric analyses conducted replicated the 3-factor model posed by the scale's authors (Tait et al., 1998), with optimal internal consistency indices obtained in both samples. Differences in the approaches' scores between countries suggested that they should be interpreted using separate norms.

Predictive validity evidence using academic achievement as the criterion showed similar behavior in both countries: the Surface approach as a negative influence and the Strategic, as positively affecting. The Deep approach only verified a significant and positive effect on academic achievement for the Spanish sample. Such a finding suggests that Deep approach itself is not enough to improve achievement; such enhancement seems feasible exclusively when the Strategic approach is added to the equation. In other words, academic achievement requires organization and a planned effort in the use of study strategies: Understanding contents is not enough; they should be properly fixed to obtain good results in evaluations.

Study 2

Study 2 examined learning approaches in undergraduates with high and low academic achievement in both countries, by means of latent class analysis. As a result, a 2-class model was obtained for both samples: Class 1, comprising high-achievement-low-Surface-approach-high-Deep-high-Strategic-approaches students; Class 2, including low-achievement-medium/high-Surface-approach-low-Deep-approach-low-Strategic-approach. The similarity between learning approaches profiles in undergraduates from both countries leads to conclude that the differences between educational contexts are not that important to affect learning processes and learning strategies.

Regarding the limitations of this research, only predictive validity evidence was examined whereas other sources of external validity should be analyzed fatherly—i.e., convergent validity evidence related to other scales assessing theoretically related variables. Besides, samples composed exclusively of Psychology

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undergraduates restrict generalization; so, examining learning approaches in students from other majors is mandatory. Plus, academic achievement was estimated differently according to the sample. Such criteria must be unified in further research.

This work has contributed in three different ways: (a) It showed that, even when differences between learning approaches by country/culture were verified, academic success was positively related to Deep and Strategic approach, and negatively to the Surface one; (b) it has adapted and analyzed the technical features of a scale to assess learning approaches, making it suitable for its use in undergraduates; (c) learning approaches profiles linked to high and low achievement were identified. Such three contributions entail interest from two different standpoints. One is theoretical since learning approaches profiles previously hypothesized as related to academic success and failure were verified. The other involves implications for the professional field. Assessing individual profiles with ASSIST in order to compare them with the ideal successful profile will let more accurate and tailored planning of teaching and evaluation methods.

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