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Validation and Adaptation of Questionnaires on Interest, Effort, Progression and Learning Support in Chilean Adolescents

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Abstract: In order to understand interest, effort and progress in learning as dispositional and contextual variables in the field of education, the activities and strategies that encourage student motivation have been continuously sought, given that they have a fundamental role in sustainability to promote the improvement of their citizenship skills and the achievement of SDGs 3 (health and well-being) and 4 (quality education) set by the UN. The objective of this study is to validate and adapt the Interest, Effort and Progress in Learning (IEPA) and contextual Student Assistance (AYES) questionnaires in the Chilean adolescent population and thus support the sustainable development SDGs. For this purpose, they were applied to a sample in two phases, first with 339 schoolchildren, and secondly, replicated with 3172 students. For their analysis, a data matrix was constructed with distribution and dispersion tests (mean, standard deviation, skewness, kurtosis and range) using the IBM SPSS.27 statistical program. Subsequently, the dimensionality of the scale was studied by applying an exploratory factor analysis with the FACTOR program, version 11, updated in 2021. Finally, a confirmatory factor analysis was performed with the M-PLUS.7.3 program. It is concluded that the instruments provide a method that is valid, reliable, simple to apply and adapted to adolescents, allowing the evaluation of three dispositional variables in students: interest, effort and progression in learning. These data indicate that they have adequate psychometric properties, which allows for a valid and reliable evaluation to contribute to the sustainability of permanent improvement in education.

Keywords: adaptation; validation; scale; learning; adolescents

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1. Introduction

In the field of education, activities and strategies have been continuously sought to foster student motivation because they play a fundamental role in promoting the development of different competencies and skills. It has been proven that the degree of personal interest in a type of content affects the quality and depth of effort and learning [1]. Students with low intrinsic motivation tend to perceive themselves as not proficient and find classes boring, leading to low engagement [2]. So, as far as interest or motivation to learn is concerned, three different aspects have been identified: a dispositional trait, a contextual characteristic and a situational psychological state [3]. Likewise, there are other related studies that have recently been developed in the Chilean context [4], which are interesting as support for the work presented here, since they highlight the involvement of teachers in maintaining the social capital of schools.

For the above reason, it is important to understand how to develop and support students' interest in the school context. Such interest should be understood from the perspective of the culture of effort that awakens intrinsic personal interest. Consequently, if

there is interest, the activity performed will be pleasurable, allowing the development of autonomous interaction with others in the pursuit of a common goal: feeling competent [5].

From the construct of interest, three characteristics have been identified: (1) situational interest aroused by a particular subject at a particular time associated with actual (post-information) information [6,7]; (2) personal interest that someone possesses for a subject or activity, which is specific to content and an object [8,9] (that is, one cannot speak of students' interest in general, since a student may be very interested in one subject and not in another); (3) interest in a particular relationship between the person and the environment that is sustained through that interaction [10].

On the other hand, effort can be described as the amount of time and energy students expend in order to meet academic requirements [11]. It can be viewed as a non-cognitive trait that reflects the student's attitude or level of enthusiasm toward participation in schoolwork, as well as the pursuit of scholastic achievement. Effort can be observed specifically when rated by their teachers [12,13].

Although different studies have addressed the relationship between students' dispositional variables—interest, effort and learning progression in different settings, such as school settings [2,5,14–20], university [21] and extracurricular and/or sport contexts [22,23]—there are not many instruments that incorporate contextual and dispositional variables in secondary education students. Effort can be a consequence of the pleasure of learning, and in this case, it is situated between progress in learning and the interest of students, for each of whom it has a very different meaning, since they experience it in a positive way. For this reason, it is necessary to evaluate students' effort and positively influence the teaching and learning process [5].

Broadening this concept, by enhancing the interest in effort in learning, the autonomy of an individual is enhanced, favoring school leadership that can be fortified by the previous motivation of students, as indicated by Jara et al. [24], stating that when students have leadership skills, they drive the strengthening of their educational community and society, encouraging and ensuring the sustainable development of SDGs 3 (health and well-being) and 4 (quality education) approved by the UN [25].

Within this framework, the team of Cecchini et al. [14] developed two scales to overcome some of the following limitations: (1) the shortcomings of questionnaires, (2) a lack of cohesion in the contents of the items, (3) the ages at which the instruments are applied, and (4) limitations in the number of items used.

These two scales created by Cecchine et al. [14] measure the contextual and dispositional aspects of learning [3,26] based on the motivational orientation scales of Duda and Nicholls [27] adapted and translated to the Spanish version by Castillo et al. [28]. From there, they globally analyzed the interest, effort and learning progression of students and constructed useful instruments to measure contexts in different curricular subjects and generate age-appropriate questionnaires (with few items), so that the instrument is effective and efficient. These instruments are as follows: (1) the Interest, Effort and Progress in Learning (IEPA) questionnaire, which aims to assess three dispositional variables of students in learning: interest (e.g., "learning is interesting and entertaining"), effort (e.g., "I make an effort to learn") and progression (e.g., "I see that I am improving"); (2) the Student Assistance questionnaire (AYES), which aims to measure three contextual variables related to students' perception of teaching techniques aimed at achieving the following objectives: (a) arousing student interest in learning (e.g., "The tasks and lessons arouse student interest"), (b) helping to learn (e.g., "The teacher knows how to help us and does so") and promoting the value of effort (e.g., "Student participation and effort are valued").

The aforementioned instruments were validated in different subjects. The scales, composed of three dimensions of four items each, were applied to a sample of 835 secondary school students (14 to 17 years old) from eight schools. In relation to all standardized loadings and critical t values, they exceeded the minimum recommended levels, and the alpha coefficient ranged between 0.85 and 0.91. The two questionnaires show adequate construct, convergent, discriminant and concurrent validity, which is why they have been

used in some research on adolescents [2,15,16] in the field of school sports programs [22,23] and in the university context [21].

Other studies describe the levels of quality of first-year university students [29] using other questionnaires, such as the Kidscreen-52, depending on the sociodemographic variables sex and age. They conclude that the best rated fields in the area of quality of life are the school environment, psychological well-being, relationship with parents and family life, self-perception and social acceptance.

Therefore, although the instruments have already been validated, it should be considered that, when applied to another population, culture and historical moment, they should be subjected to a new validation, since it is a continuous and dynamic process and the more validation processes they undergo, the more consistency they will have in their psychometric properties, adjusting to different cultures, populations and subjects [30]. Transcultural adaptation involves the evaluation of linguistic and conceptual equivalence and measurement properties [31]. Therefore, the objective of this research is to adapt and validate the IEPA and AYES instruments to assess interest, effort and progress from the contextual and dispositional variables of learning in the Chilean adolescent population.

2. Materials and Methods

Since IEPA and AYES have been gestated and used outside the Chilean context, instrumental research was conducted [32,33] in which the dimensionality and reliability of the scale were evaluated to ensure that both instruments meet the minimum scientific properties that guarantee the reliability and validity of the data used to be applied in the Chilean context.

2.1. Participants

The sample object of this study were from the Chilean population of the Lagos Region, in the south of Chile, with ages between 10 and 20 years old and from different types of educational establishments.

The study was carried out in two stages. In the first stage, the sample consisted of 339 schoolchildren, 183 (54%) males and 156 (46%) females, grouped into pre-adolescents aged 10–13 years (n = 135, 39.8%) and adolescents aged 14–20 years (n = 204; 60.2%). In the second stage, the methodology was replicated in 3172 students with the same territorial characteristics, with n = 1432 females (45%) and n = 1740 males (55%), with an average age of 14.29 years, distributed into 1184 (37.3%) pre-adolescents aged 10–13 years old and 1988 (62.7%) adolescents aged 14–20 years old.

2.2. Instruments

The questionnaires created by Cecchini et al. [14], EIPA and AYES, were used. Each questionnaire has 12 items that are subdivided into three factors. In the case of EIPA, the factors are interest, progression and effort, and in AYES, arousing interest, helping to learn and valuing effort. A Likert-type scale from 1 (strongly disagree) to 5 (strongly agree) was used.

2.3. Procedure

We proceeded to invite the different educational establishments chosen for convenience, explaining the purpose of the research, and requesting their participation. After obtaining the permission and the approval of the parents by means of informed consent, the questionnaires were applied, with the authorization of the Ethics Committee of the University of Jaen, which endorsed the study, whose reference code is: JUN.23/0 TES. When the questionnaires were distributed to the students, the objective of the study and the importance of their participation were explained to them, indicating that their personal data would not be used and that the results obtained would only be used for research purposes and subsequent scientific dissemination of the results, and would be used under total anonymity.

The application of the questionnaires was carried out exclusively by the principal investigator of the study, considering the availability and coordination of each school, to avoid contamination in data collection. The process lasted 15 min and was carried out in groups and with the presence of a teacher from the educational establishment.

2.4. Statistical Analysis

After applying the questionnaires, to analyze the metric properties of each item, using basic descriptive coefficients, data analysis was performed, constructing a matrix with distribution and dispersion tests, mean, standard deviation, skewness, kurtosis and range using the statistical program IBM SPSS.27 (IBM Corp., Armonk, NY, USA) [34]. Following the suggestions of Lloret et al. [35], a sequence of exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) was used for an analysis of psychometric properties. The study of the dimensionality of the scale was carried out by applying an AFE with the FACTOR program created by Lorenzo-Seva and Ferrando [36], version 11, updated in 2021, where the diagnosis of the goodness of fit is essential to establish the validity of the scales. Finally, to verify the internal consistency of the instrument, Cronbach's alpha was used and the AFC was executed according to the results. The parameters estimated with the second phase of the model were replicated and the factorial invariance of the model was checked by age subgroup (pre-adolescents and adolescents) using the M-PLUS.7.3 program [37].

3. Results

In order to test whether the scales can be successfully used and applied in the Chilean population, the first phase of this study involved a sample of n = 339 adolescents between 10 and 20 years of age, and we calculated in the two questionnaires (IEPA and AYES) the descriptive values, central tendency and dispersion of all the items that make up each scale. Then, the dispersion curve of the items was calculated by applying the skewness and kurtosis tests with a range of ±2000 [38,39]. With the results obtained, it was possible to verify that all the items presented an acceptable distribution, as well as the value reached by the standard deviation exceeding a value of 1.000. The corrected homogeneity index presented acceptable values, all above 0.500 (Table 1: IEPA and Table 2: AYES).

Table 1. EPA scale: central tendency and dispersion measures of items.

IEPA 339	M	DT	Asim	Curt	IHc
Learning is fun	3.56	1.324	−0.670	−0.614	0.578
I notice that my level is improving	3.64	1.255	−0.638	−0.545	0.770
I persist in trying to improve	3.78	1.160	−0.820	−0.020	0.716
I have fun learning	3.50	1.171	−0.449	−0.458	0.676
I observe that my skills in this subject are improving	3.66	1.215	−0.655	−0.446	0.709
I make an effort to learn	3.91	1.166	−0.925	0.001	0.689
I have fun learning skills and/or competencies	3.71	1.214	−0.636	−0.518	0.702
I see that I am improving	3.62	1.182	−0.632	−0.382	0.766
I push myself as much as I can	3.58	1.329	−0.632	−0.704	0.662
Learning is interesting and enjoyable	3.49	1.245	−0.500	−0.671	0.714
I feel that I am making progress	3.59	1.168	−0.559	−0.410	0.748
I try to improve myself	4.00	1.198	−1.149	0.389	0.684

Note concepts. M: median; DT: standard deviation; Asim: skewness; Curt: kurtosis; IHc: corrected homogeneity index.

Before performing the EFA, we checked whether the participants in the study came from populations with the same variance, as well as whether they presented acceptable sample adequacy. For this purpose, Bartlett's statistic and the Kaiser–Meyer–Olkin test were applied, yielding results for the IEPA questionnaire [Bartlett's statistic = 2869.5 (df = 66; p = 0.000010), (KMO = 0.927)] and for the AYES questionnaire [Bartlett's statistic = 3315.7 (df = 66; p = 0.000010), (KMO = 0.936)]. Both questionnaires show a good fit to the data (Table 3).

Table 2. AYES scale: central tendency and dispersion measures of items.

AYES 339	M	DT	Asim	Curt	IHc
The proposals are fun	3.29	1.308	−0.301	−0.856	0.590
The teacher helps us when we have trouble learning	3.86	1.174	−0.764	−0.378	0.605
Students' effort and participation are rewarded.	3.44	1.289	−0.426	−0.846	0.711
Practices are enjoyable	3.63	1.218	−0.634	−0.438	0.717
The teacher guides us adequately in learning	3.93	1.154	−0.94	0.100	0.707
The effort and perseverance of the students is taken into account.	3.63	1.253	−0.688	−0.457	0.726
The tasks and lessons awaken the interest of the students.	3.37	1.289	−0.393	−0.856	0.703
The teacher knows how to help us and does so	3.74	1.204	−0.744	−0.270	0.768
Students' participation and effort are valued	3.67	1.279	−0.683	−0.559	0.736
The range of activities offered is interesting and thought-provoking	3.50	1.239	−0.465	−0.656	0.717
The teacher teaches us how to learn	3.96	1.102	−0.912	0.169	0.771
The students' efforts are recognized	3.70	1.287	−0.741	−0.508	0.729

Note concepts. M: median; DT: standard deviation; Asim: skewness; Curt: kurtosis; IHc: corrected homogeneity index.

The data recording was ordinal (Likert scale from 1 to 5); therefore, and following the indications of Muthén and Kaplan [39,40], it is considered appropriate to use the robust estimation of unweighted least squares (ULS) and polychoric correlations for the extraction of factors in the EFA.

To check whether the number of factors was equal to the original scale, the optimal implementation method of parallel analysis proposed by Timmerman and Lorenzo [41] was used, carrying out 10,000 resamples (Table 3).

The AFE shows the extraction of three factors in the IEPA questionnaire, which explain 76% of the variance. The results derived from the goodness-of-fit index for the questionnaire (GFI = 0.999) and the residual root mean square (RMSEA = 0.045) show a good fit of the three-dimensional structure for these items [42] (Table 3).

The AYES questionnaire when performing the EFA shows the extraction of three factors, which explain 77% of the variance. In relation to the values derived from the goodness-of-fit index for the questionnaire (GFI = 0.997) and the residual root mean square (RMSEA = 0.048), they also show a good fit of the three-dimensional structure for these items (Table 3).

Table 3. Values achieved in the different adjustment indexes (IEPA and AYES).

	Varianza	Estadístico de Bartlett	KMO	RMSEA	CFI	GFI
IEPA (n = 339)	76%	2869.5 (df = 66; p = 0.000010)	0.927	0.045	0.997	0.999
AYES (n = 339)	77%	3315.7 (df = 66; p = 0.000010)	0.936	0.048	0.998	0.997

Note about concepts—KMO: Kaiser–Meyer–Olkin; RMSEA: root mean square error of approximation; CFI: comparative fit index; GFI: goodness-of-fit index.

The reliability index of each factor (Cronbach's alpha for ordinal data) where the three factors in each questionnaire exceeded 0.700 [43], given as the average in both questionnaires (IEPA and AYES), and among the three factors, Cronbach's alpha had the same value of 0.853 (Tables 4 and 5). Regarding the values of the rotated loading matrix of all the variables and the rotated loading matrix with values lower than 0.300 omitted, it is observed that all the factors reach values higher than 0.400 in both questionnaires (Tables 4 and 5).

Subsequently, the MPLUS.7.3 program was used to corroborate the results obtained in the AFE carried out with a sample of 339 subjects, but for this CFA of the two questionnaires (IEPA and AYES), the entire sample was applied, amounting to 3172, dividing the sample into pre-adolescents and adolescents. Following the recommendation of experts [44,45], MLM was used as the estimator. The fit index values indicate that RMSEA $\leq$ 0.08, CFI $\geq$ 0.95, TLI $\geq$ 0.95 and SMRM $\leq$ 0.08, the scale data being a good fit for a three-dimensional definition of the factors (Table 6).

Table 4. Rotated loading matrix of all variables, rotated loading matrix omitting values below 0.300, communality and Cronbach's alpha of each factor (IEPA).

IEPA. N = 339	Rotated Loading Matrix			Rotated Loading Matrix (Loadings Lower than Absolute 0.300 Omitted)			
Variables	**F1**	**F2**	**F3**	**F1**	**F2**	**F3**	**Comm**
VI	0.558	0.009	0.162	0.558			0.474
V2	0.000	0.726	0.148		0.726		0.732
V3	0.076	0.245	0.518			0.518	0.636
V4	0.909	−0.078	0.038	0.909			0.763
V5	0.204	0.884	−0.262		0.884		0.713
V6	0.170	−0.028	0.703			0.703	0.649
V7	0.435	0.235	−0.002	0.435			0.631
V8	−0.139	0.914	−0.013		0.914		0.799
V9	−0.004	0.013	0.779			0.779	0.619
V10	0.734	0.104	0.043	0.734			0.727
V11	−0.071	0.734	0.188		0.734		0.712
V12	−0.095	0.008	0.940			0.940	0.780
Cronbach's Alpha				**0.845**	**0.875**	**0.840**	

Concept note—Comm: communality.

Table 5. Rotated loading matrix of all variables, rotated loading matrix omitting values below 0.300, communality and Cronbach's alpha of each factor (AYES).

AYES. N = 339	Rotated Loading Matrix			Rotated Loading Matrix (Loadings Lower than Absolute 0.300 Omitted)			
Variables	**F1**	**F2**	**F3**	**F1**	**F2**	**F3**	**Comm**
VI	0.998	0.345	0.656	0.998			0.583
V2	0.292	0.996	−0.727		0.996		0.659
V3	0.383	−0.014	0.583			0.583	0.643
V4	0.995	0.078	−0.246	0.995			0.704
V5	0.052	0.829	−0.051		0.829		0.689
V6	0.031	0.257	0.549			0.549	0.666
V7	0.729	−0.203	0.281	0.729			0.669
V8	0.026	0.852	0.008		0.852		0.778
V9	0.095	0.067	0.692			0.692	0.708
V10	0.694	0.103	0.015	0.694			0.640
V11	−0.091	0.848	0.130		0.848		0.783
V12	−0.064	0.035	0.884			0.884	0.732
Cronbach's Alpha				**0.828**	**0.867**	**0.864**	

Concept note—Comm: communality.

Table 6. Values of confirmatory factor analysis fit indices.

IEPA	χ^2	*p*	RMSEA	CFI	TLI	SRMR
Totality	196.729	0.0000	0.049	0.971	0.962	0.033
Pre-adolescents	196.729	0.0000	0.049	0.971	0.962	0.033
Adolescents	403.386	0.0000	0.059	0.963	0.952	0.030
AYES						
Totality	508.904	0.0000	0.053	0.967	0.957	0.026
Pre-adolescents	221.980	0.0000	0.053	0.965	0.954	0.031
Adolescents	340.873	0.0000	0.053	0.968	0.959	0.026

Concept note—χ^2: Chi-square; *p*: *p*-value; RMSEA: root mean square error of approximation; CFI: comparative fit index; TLI: Tucker-Lewis index; SRMR: normalized root mean square residual.

The estimated parameters for from the original model of the IEPA questionnaire for the entire sample n = 3172 are presented below (Figure 1), and Figure 2 shows the

estimated parameters from the original model of the questionnaire applied to the sample of pre-adolescents and adolescents, respectively.

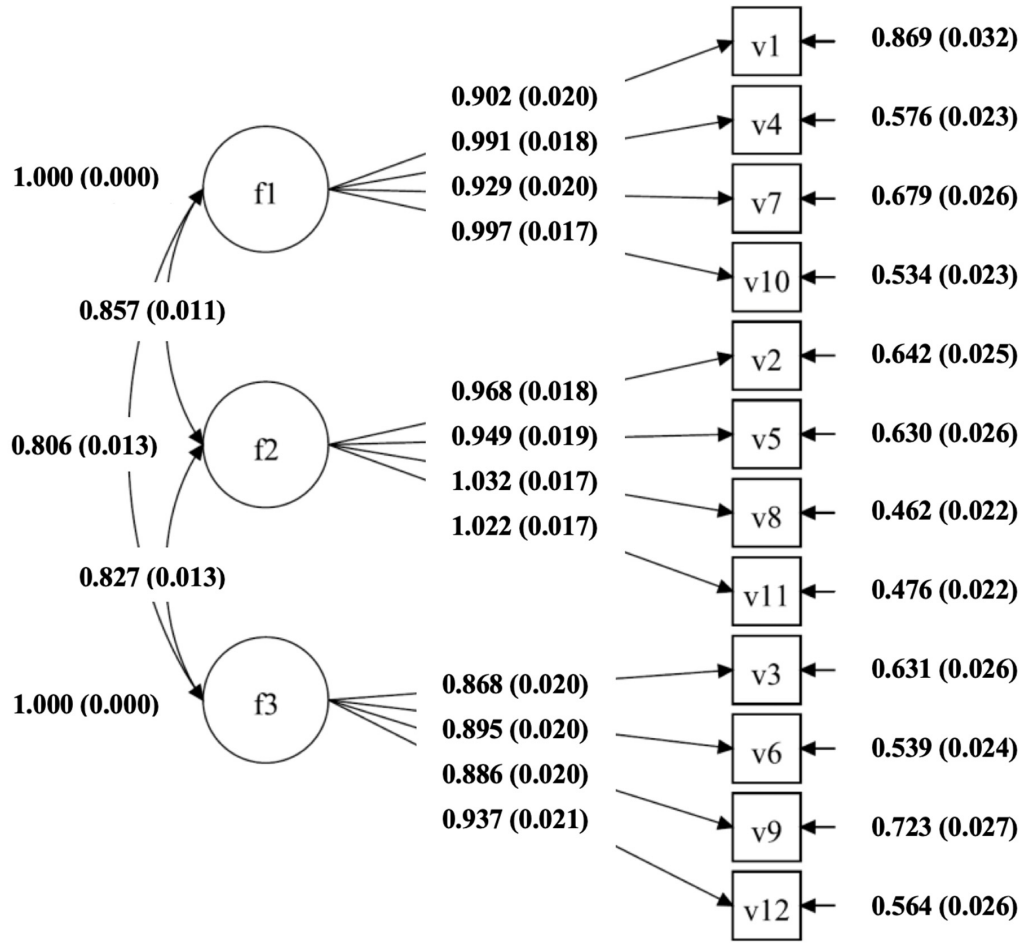

Figure 1. Estimated parameters for the original IEPA scale model total (n = 3.172).

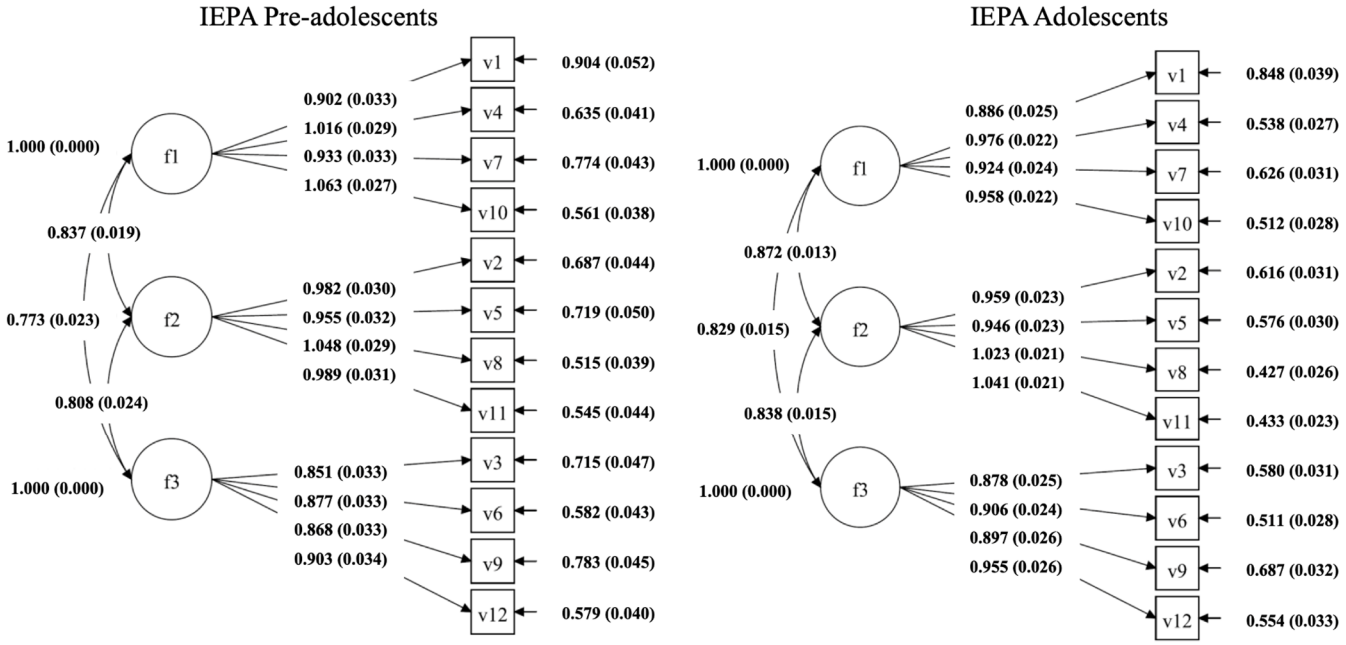

Figure 2. Estimated parameters for the original model of the IEPA pre-adolescents and adolescents scale.

Figure 3 shows the estimated parameters from the original model of the AYES questionnaire for the entire sample n = 3172 and Figure 4 shows the estimated parameters from the original model of the questionnaire for the sample of pre-adolescents and adolescents, respectively.

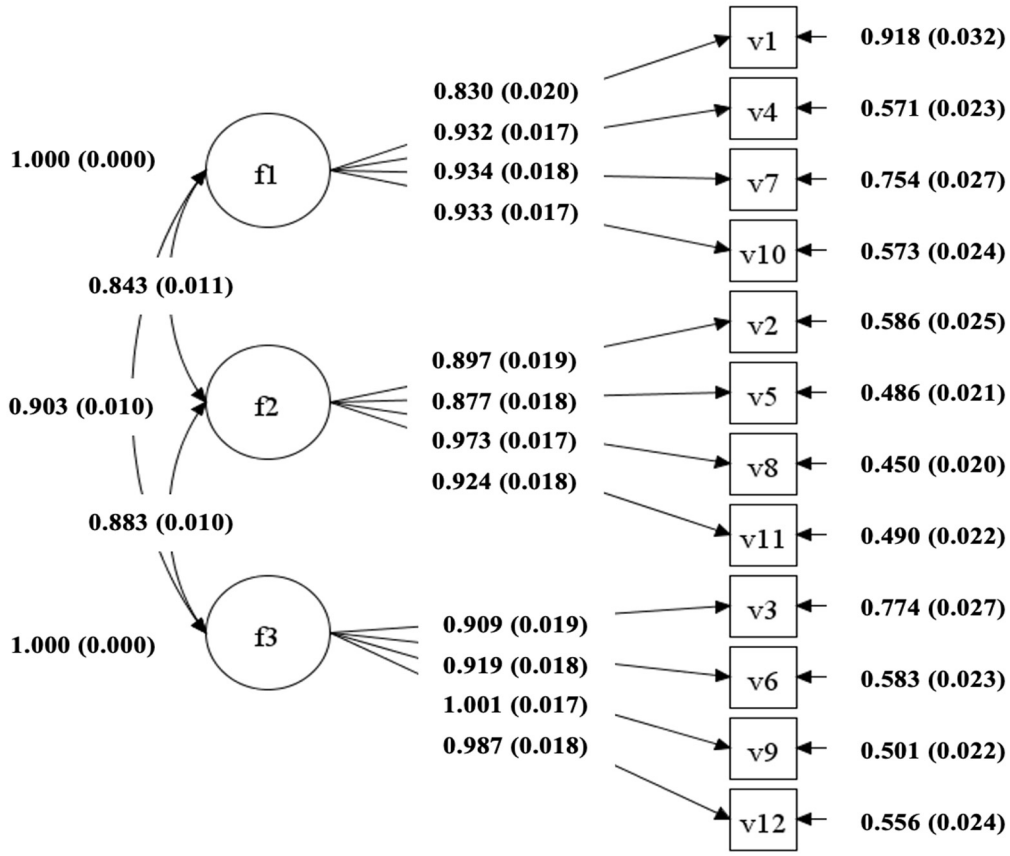

Figure 3. Estimated parameters for the original AYES scale model total (n = 3.172).

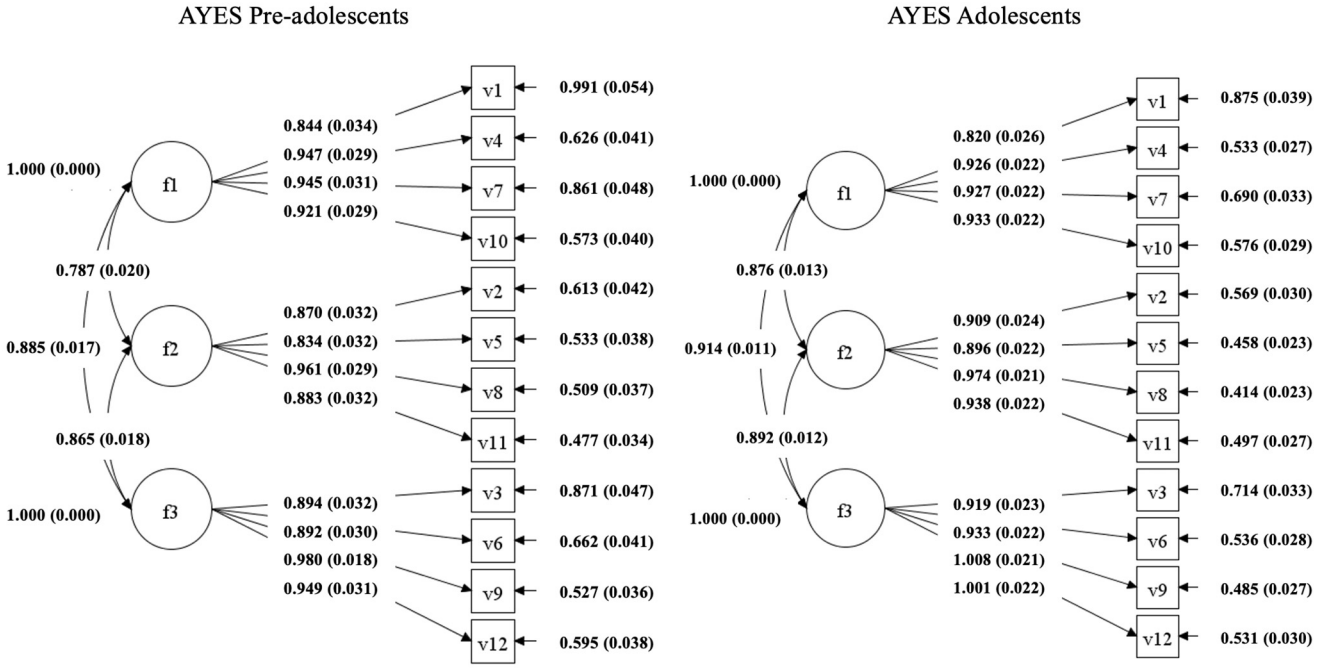

Figure 4. Estimated parameters for the original AYES scale model For pre-adolescents and adolescents.

All the estimated parameters were found to be statistically significant, so it is considered correct to keep them in the model.

4. Discussion

The objective of this research was the validation and adaptation of the IEPA and AYES questionnaires to be applied to adolescents in the Chilean school context. Upon adapting it by grouping its 12 items into three factors, each with four items, both questionnaires showed adequate construct validity, reliability and internal consistency. These results indicate that these scales have adequate psychometric properties, allowing for a valid and reliable assessment, thus responding to the need for instruments with guaranteed success which measure both contextual and dispositional aspects of learning, globally analyzing the interest, effort and progression of students, so they can be used in different curricular subjects in Chilean adolescents.

In the validation of both questionnaires (IEPA and AYES), all the standardized loadings greatly surpassed the recommended minimum levels of 0.50 [46,47]. Cronbach's alpha reached in both above 0.85. Therefore, the discriminant power of both scales can be considered high.

When performing the CFA using the MLM estimator, the values of the fit index indicate, in the two questionnaires, RMSEAs 0.49 and 0.59, CFIs of 0.971 and 0.967, TLIs of 0.962 and 0.957 and SMRMs of 0.033 and 0.026, being a good fit to the data of both. As in the design and validation of Cecchini et al. [14], where Cronbach's alpha is between 0.85 and 0.91, in both questionnaires, the CFI values fluctuated between 0.98 and 0.99, AGFIs between 0.95 and 0.96, SRMRs between 0.03 and 0.05 and RMSEA between 0.016 and 0.060. It can be indicated, then, that, in both validations, the results exceeded the most demanding conditions, retaining the same factorial structure as well as the same number of items as the original instrument. These results confirm that these scales can be considered valid and reliable instruments for measuring the dispositional and contextual aspects of learning [3,26]. Therefore, the two instruments can be considered adequate and effective [48–50].

Another purpose of this study was to check the suitability of both scales in widening the age group [51], given that in the design and validation, they were applied to ages of 14 to 17 years. For this validation, the age group was extended from 10 to 20 years, so that all of adolescence was covered, following the ranges of adolescence proposed by the WHO [52]. Consequently, the CFA was subdivided into two groups, one for pre-adolescents (10 to 13 years) and the other for adolescents (14 to 20 years) for validation, demonstrating the values of the fit indexes between the two questionnaires, which, in the case of the pre-adolescents, were RMSEA 0.51, CFI 0.968, TLI 0.958 and SMRM 0.032, and in the group of adolescents, were RMSEA 0.56, CFI 0.966, TLI 0.966 and SMRM 0.028. It is shown that, by extending the age group of adolescence, this instrument also shows good reliability and validation for use.

Validated instruments and/or instruments adapted to the Chilean context are scarce, especially in the evaluation of contextual and dispositional aspects of learning. A study conducted in Chile in a school setting carried out the design and validation of a questionnaire to measure the commitment of Chilean adolescents, covering three dimensions: affective, cognitive and behavioral [53]. Likewise, in other studies, various instruments have been used where, in some cases, neither their reliability nor their validation are assessed [54], so it is necessary to highlight that in the review of [55], no research was found in this area in Chilean adolescents between the years 2015 to 2020. For this reason, it is necessary to further study learning motivation in adolescent students, since in Latin America, high school students present lower academic performance [56].

This shows the importance of carrying out validation and adaptation with a higher degree of validation both at the EFA and CFA levels, achieving a reliable and valid instrument for subsequent studies. The validation processes of an instrument should be treated permanently, as in this way, it becomes more solid as the psychometric properties become

more consistent, adapting it to different cultures, subjects and locations [31]. This was the main purpose of this study, where we carried out instrumental validation in a different territory and with different traits, periods and characteristics of the sample.

In line with the above, another important and necessary aspect to consider is that, in Latin America, it is necessary to advance in the design of highly valid research to guarantee results. Specifically, in the systematic review by López-Angulo et al. [54], it is pointed out that some studies agree that the greatest contribution to research on learning motivation has been made in the field of the self-regulation of learning being in European countries (61.9%), followed by Asia (23%), evidencing the lack of studies that have been developed in some regions of the world such as Latin America and North America [55,57].

Therefore, studying interest, effort and progression becomes very relevant from a school and research perspective. When a student finds that their classes are fun and interesting, they will feel more motivated. With this in mind, many authors study intrinsic motivation [58]. When we relate this to the teaching–learning process, the level of personal interest that a student has in a subject and/or activity has an impact on their effort and therefore on their learning [1]. When students see that their teachers encourage them in their subject with positive practices and value their effort and progress, the students become more interested and put more effort into their learning. On the contrary, when students have little intrinsic motivation, they generally think that they are not capable of learning and get bored in class. Therefore, the dispositional and contextual variables of interest, effort and progression for learning prove to be favorable from a teaching perspective when the student is involved, showing improvements in motivation and therefore better performance and learning [2].

Some results obtained in other studies that used these same instruments have shown that there are motivational differences between subjects, genders and ages. As is the case in a particular study that applied them to the subject of English [19], which found differences in terms of gender, girls had higher scores in terms of interest and effort in this subject, indicating that they have a greater predisposition and attitude towards learning. But in the case of the study by Cecchine et al. [15], where he analyzed the differences between subjects such as mathematics, language and communication, and physical education, finding differences between two of them, students had lower scores in mathematics and language and communication, specifically in the dispositional variable "I have interest in learning" and in the contextual variable "the teacher awaken their interest". On the contrary, they had a higher scores in the subject of physical education.

Therefore, in view of the results obtained in these studies, it is clear that teaching practice is a categorical component for the achievement of learning in different subjects [59]. Likewise, methodological strategies such as the materials used by the teacher are fundamental for effective teaching [60]. This demonstrates the importance of students having positive experiences, which enhance their attention and motivation to learn [61]. As indicated by Schiefele and Csikszentmihalyi [62], learning is not mostly related to the student's learning skills, but rather to the significant experiences perceived in the teaching–learning processes.

The validated instruments (IEPSA and AYES) that analyze dispositional and contextual variables could offer the possibility for school communities to make better local and informed decisions, thus allowing them to better identify and address the interest, effort and learning progression of their students in conjunction with the teaching process, aimed at awakening their interest in the subject being taught, helping them to learn and promoting greater effort in the classroom. Because the contextual variables show a level of effectiveness of teaching techniques that are related to the involvement of students in learning, an improvement in motivation is observed, so these scales can be considered valid tools to measure dispositional, contextual and motivational variables [15].

In view of the results obtained in this study, we reinforce that the pedagogical training of teachers is a decisive element for teaching. That said, teachers should be knowledgeable about individualized teaching techniques, where the student is taken into account as an

active subject. If a sense of humor is also promoted in the classroom, significant progress will be made in the teaching–learning process [63].

5. Conclusions

It is concluded that the IEPA and AYES instruments comply with the validation and reliability procedures. Both questionnaires showed adequate construct validity, reliability and internal consistency. These results indicate that these scales have adequate psychometric properties, allowing a valid and reliable assessment. Therefore, they are valid, reliable, easy-to-apply and adapted types of measurement to evaluate interest, effort and progression in learning, considering dispositional and contextual variables, to be used in adolescent schoolchildren in the Chilean context.

The validation of both instruments will allow them to be used with guaranteed success in the entire population of adolescents in the Chilean school system, becoming a tool that can support the permanent and sustainable improvement of the teaching–learning process, thus promoting the strengthening of the educational development of the curriculum and keeping it in line with the sustainable development goals set by the UN.

Strengths, Limitations and Future Prospects

These findings demonstrate the relevance that these instruments hold in terms of their high levels of validation, and their potential to be used in the school context, to guide teachers on how to influence their students to achieve greater intrinsic motivation by supporting their autonomy, which will allow them to acquire positive and meaningful learning in the future.

As a perspective for future research, it would be necessary to use a more stratified sample that is more representative of the population, such as differentiating by gender, type of establishment and/or socio-cultural and economic level, which could obtain other values. Likewise, the results could be applied and analyzed and/or compared with other studies, in order to have a clear vision of the interest, effort and progression of students in the different subjects and of different ages in the Chilean context.

Some of the limitations of this study are related to the type of research: since it is an instrumental validation conducted through self-report measures, it was not possible to analyze cause–effect relationships, and the results of the sample at the time of application could have been influenced by other agents of the affective environment, such as family and friends, previous performance in a subject, the competencies of the teachers and the socioeconomic environment.

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Data Availability Statement: Data are contained within the article. The detailed accident data cannot be disclosed due to confidentiality agreements.

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