Validation of the Spanish Version of the Academic Engagement Scale for Primary Education

Validación de la Versión Española de la Escala de Compromiso Académico para Educación Primaria

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Abstract

Student academic engagement is currently a topic of great interest within the field of educational research. Consensus exists in the scientific literature that it is a multifaceted construct made up of three dimensions: behavioral, affective/emotional and cognitive engagement. Nonetheless, other work has emerged advocating for the inclusion of a fourth dimension, namely, agentic engagement. Despite advances produced internationally, in Spain, there is a lack of valid instruments to measure academic engagement at primary education level. Thus, the present study aimed to carry out a cross-cultural validation and adaptation to the Spanish context of two important instruments for measuring academic engagement in primary education. Following a process of adaptation, the instrument was administered to a sample of 527 students (54.3% boys, 45.7% girls) undertaking 3rd to 6th grade primary education in six schools in the province of Albacete (Spain). Confirmatory factor analysis was performed of different plausible models in order to obtain the most appropriate factor structure. Reliability analyses were also conducted. Outcomes revealed that better fit was achieved in models in which agentic engagement was integrated separately to the other three dimensions, making this the most appropriate option. The resulting instrument, the academic engagement scale for primary education students, was shown to be valid and reliable for measuring this construct within Spanish students undertaking between 3rd and 6th grade of primary education.

Keywords: Academic engagement; Cross-cultural adaptation; Validation; Primary education; Instrument.

Resumen

El interés por el estudio del compromiso académico del estudiante se encuentra actualmente en auge dentro del ámbito de la investigación educativa. Existe un consenso en la literatura científica que lo considera un constructo multifacético conformado por tres dimensiones: compromiso conductual, afectivo/emocional y cognitivo; aunque han surgido otras voces que defienden la inclusión de un cuarto elemento: el compromiso agéntico. A pesar de los avances conseguidos a nivel internacional, en España se carece de instrumentos válidos para su medición durante la Educación Primaria. Por tanto, el objetivo del presente estudio se centró en realizar una validación y adaptación transcultural al contexto español de dos importantes instrumentos de medida del compromiso académico para Educación Primaria. Tras seguir un proceso de adaptación, el instrumento se administró a una muestra de 527 estudiantes (54.3% chicos, 45.7% chicas) de 3º a 6º de Educación Primaria de seis centros educativos de la provincia de Albacete (España). Se realizaron análisis factoriales confirmatorios, en base a diferentes modelos plausibles para obtener la estructura factorial más adecuada, y análisis de fiabilidad. Los resultados revelaron que los modelos que agrupaban al compromiso agéntico de manera separada frente a las otras tres dimensiones alcanzaban mejores niveles de ajuste, siendo esta la opción más adecuada. Se constata que el instrumento resultante, Escala de Compromiso Académico para alumnado de Educación Primaria, es válido y fiable para la medición de este constructo en alumnado español escolarizado entre 3º y 6º de Educación Primaria.

Palabras clave: Compromiso académico; Adaptación transcultural; Validación; Educación Primaria; Instrumento.

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The achievement of effective student learning and engagement in the teaching-learning process should be one of the main goals of any educational system (Fredricks & McColskey, 2012). For this reason, the study of the concept of academic engagement (hereon AE) in students belonging to different educational levels and age groups is a topic of growing interest in the field of educational psychology research (Serrano & Andreu, 2016). In general terms, numerous authors agree that AE is a hugely relevant factor for the academic performance of students as it prevents phenomena such as school failure or early dropout, whilst also promoting successful educational processes (Rodríguez-Fernández et al., 2016).

The importance of this concept has been demonstrated by a vast body of specialized literature in the field which has shown it to be a relevant predictor of different educational outcomes and examined the multiple meaningful relationships, whether positive or negative, that it has with various variables from within the school context (Wang & Peck, 2013). Positive relationships pertain to variables related with key elements of student development (Vracheva et al., 2019), school integration (Moreira & Lee, 2020), school satisfaction (Gutiérrez et al., 2017), classroom environment and motivation (Martin et al., 2015), socialization processes and student-teacher relationships (Alemu & Woldetsadik, 2020), achievement and goal attainment (Burns et al., 2021), and levels of personal satisfaction and self-fulfillment (Clark & Malecki, 2019). Similarly, negative relationships pertain to variables related with teacher and student burnout, which is understood as a negative emotional, physical and mental reaction to prolonged work resulting in exhaustion, frustration, lack of motivation, feelings of ineffectiveness and lack of fulfilment (Madigan & Kim, 2020), disruptive behavior and school absenteeism (Siddiq et al. 2020), amongst others.

Traditionally, interest in the study of AE has focused on its link with the academic performance and achievement of students (Miranda-Zapata et al., 2018), with the aim of identifying students who are more committed and involved with their school and analyzing the role this plays in their daily work. On the other hand, numerous studies have concluded that AE is a key element in the phenomenon of early school-dropout (Suárez et al., 2019), which is understood as a cumulative and sequential process that does not occur immediately but, instead, as a consequence of the accumulation of unfavorable circumstances in the school context which lead to the student losing interest, dedication and commitment to their studies.

In light of this background, Tarabini et al. (2018) indicates that the study of AE emerges as a fundamental concept for promoting satisfactory educational practices which support students in the achievement of successful present and future educational trajectories. For example, promoting education and assisting the transition to higher education (Zaff et al., 2017), and tackling phenomena such as early school-dropout. This is considered even more concerning when viewed within the context of interest to the present study. Specifically, Spain is currently the country with the highest dropout rate in the European Union (Eurostat, 2020). Consequently, it is apparent that a better understanding of the conditions in which successful learning and student academic development take place may be key for educational administrations and government agencies to be able to design strategies aimed at promoting success and preventing failure (Wang & Hofkens, 2020).

With regards to conceptualization, exhaustive analysis and review of previous literature highlights the difficulty of reaching unanimous consensus on a specific definition and measurement of AE (Garrett, 2011; Sinatra et al., 2015). Firstly, numerous research studies have approached this concept using different nomenclatures. In broad terms, apart from *academic engagement*, two other widespread theoretical conceptions exist which seek to limit the concept to the field of education. On the one hand, a less common conception of the

term *student engagement* (Stevenson et al., 2021) employed by authors refers to a person-centered orientation, meaning that it focuses on the role of students as those with main responsibility for their educational process and academic achievement. Other authors use a more common term, corresponding to *school engagement* (Tomás et al., 2016; Lara et al., 2018), to refer to an orientation that is more focused on the context surrounding the learner and the way in which it influences their level of engagement. The use of this term implies the existence of a broader horizon of shared responsibility, not only focused on the role played by students but, also, encompassing a set of variables and conditioning factors from the school context that are key to its proper conceptualization.

Despite that presented above, certain consensus is found that considers AE as a complex multifaceted construct which encompasses different independent and yet interconnected dimensions which are mutually reinforcing (Wang et al., 2011; Corchuelo et al., 2019). The dimensions that define it pertain to affective-emotional, cognitive and behavioral subcomponents (Fredricks et al., 2016; Rodríguez-Pereiro et al., 2019), which are closely linked, in the words of Veiga et al. (2014), to the set of "feelings, thoughts and behaviors that students express about their experiences in the school context" (p. 31).

Sandoval-Muñoz et al. (2018) point out that the multidimensional nature of this construct means that AE is considered a biopsychosocial phenomenon. This phenomenon is closely related to student expectations and development and the specific context in which this takes place. It involves a set of conditioning factors which must be considered in order to achieve and develop this commitment (Hazel et al., 2013). Thus, it is a highly malleable state, whose measurement is influenced by a number of external variables. This opens up the possibility of making effective changes to school practices and teaching-learning processes as a means to producing favorable outcomes (Lara et al., 2018).

With regards to the dimensions that make up AE, the model comprising three dimensions (behavioral, affective/emotional and cognitive) is currently the most widely accepted. *Behavioral engagement* has been defined in relation to the observed behavior of students in terms of their participation in the teaching-learning process and the performance of academic tasks. Fatou & Kubiszewski (2018) define it as the existence of all behaviors associated with school expectations regarding the completion of assignments or homework, effort and persistence (Valle et al, 2016), class attendance (Lukkarinen, 2016), level of interest, student concentration and attention in lessons, participation and active interaction in the classroom (Wang et al., 2019), the existence of prosocial behavior and the absence of disruptive behavior, and respect and compliance with school rules and regulations (Fredricks et al., 2016).

Affective/emotional engagement pertains to the sense of belonging, emotional response and affective bonds that students forge with their school, teachers and other classmates (Tomás et al., 2016). Ramos-Díaz et al. (2016) associate this dimension with student perceptions of belonging in reference to the school community and the set of attitudes they have towards the school and the social relationships created within it, ideally, feeling integrated and included as a part of the school community.

Cognitive engagement involves the degree to which learners attend to and devote cognitive effort towards understanding learning. It is defined as the psychological involvement of learners in mastering difficult skills and the use of metacognitive strategies for understanding complex ideas (Fredricks et al., 2004). Thus, this dimension encompasses student willingness and readiness to exceed minimum academic requirements, leading them to implement strategies to delve into the performance of complex and challenging tasks, and employ self-regulated learning strategies, and creative and flexible problem-solving strategies (Lara et al., 2018).

Presently, some authors suggest that AE is shaped by a fourth dimension. Reeve and Tseng (2011) coined the term *agentic engagement* to describe students' constructive efforts in their own learning process. In other words, their productive contributions to the flow of instruction by expressing interest and offering input to the teacher (Montenegro, 2017). According to Reeve (2013), behavioral, affective and cognitive engagement is stimulated via directional processes initiated by the teacher. From the perspective of this fourth dimension, agentic engagement refers, specifically, to productive contributions initiated by the learner. It is, therefore, conceived as a type of intentional, proactive and reciprocal participation emerging from the learner which enables the teacher to find ways to enrich, modify and personalize the instruction taking place in the classroom.

All of the dimensions of AE reveal a multidimensional view of student engagement in the school environment, pointing to aspects which significantly influence whether a student is engaged in their learning and highlighting the importance of this construct in the field of educational research. Conceptualized in this way, it is evident that, despite being different, the dimensions that shape AE overlap as they are clearly interrelated (Sinatra et al., 2015).

In relation to the existing instruments for measuring AE, the *school engagement measure* (SEM; Fredricks et al., 2004) has been selected for use in the present study as it is considered one of the most widely used questionnaires in the literature for measuring student AE at international level (Fredricks et al., 2016). Precedents can also be found in the Spanish context, with work carried out by Ramos-Díaz et al. (2016) standing out. Such work has validated this instrument for use with 12-16-year-old adolescent students enrolled on compulsory secondary education (from now on *ESO* in line with its name in Spanish).

In turn, other studies, such as that carried out by Reeve & Tseng (2011), proposed, for the first time, the existence of a fourth dimension, corresponding to agentic engagement. Analyses of the original instrument proposed have shown that this dimension is independent and relevant for the conceptualization of AE, as it is significantly related to all of the other three dimensions. In this regard, Cuevas et al. (2016) validated and adapted the *agentic engagement scale* (Reeve, 2013) to the Spanish context, specifically, for use with students enrolled on ESO and aged between 12 and 19 years old. Analyses of the instrument confirmed its content validity and internal consistency, confirming it to be a reliable and valid instrument for measuring the contribution of this dimension to student AE.

Despite that discussed above and the progress achieved in studying this concept, no evidence exists in the Spanish context of the availability of tools or instruments which have been previously developed and validated to assess the four dimensions of student AE at the primary education stage. Thus, the aim of the present study was to carry out a cross-cultural adaptation to the Spanish context and validation of the AE measurement instruments proposed by Fredricks et al. (2004) and Reeve & Tseng (2011) for use with 8-12-year-old pupils undertaking 3rd to 6th grade primary education. This will contribute to the acquisition of more complete and accurate knowledge of the level of AE presented by students. This aim will be addressed through the following specific objectives:

1. Translate and validate an AE measurement instrument in consideration of the contextual, cultural and linguistic aspects relevant to proper and effective use of this tool in the Spanish school-aged population.

2. Verify the relevance of agentic engagement as an additional and novel dimension in the measurement of AE as a way of complementing, reinforcing and delving into the contributions made by the traditional model made up of behavioral, affective/emotional and cognitive components.

3. Determine the most appropriate factor structure for the resulting instrument based on the different plausible models of AE and its four dimensions.

Method

Participants

Participants were selected by means of non-probabilistic convenience sampling due to limited access to educational centers. A total of 527 students were included in the sample, of which 286 were boys (54.3%) and 241 were girls (45.7%). Participants were enrolled on the 3rd to 6th grade of primary education (21.3% in the 3rd grade, 24.9% in the 4th year, 25.4% in the 5th year and 28.5% in the 6th year) and aged between 8 and 13 years old ($M = 10.0$; $SD = 1.24$). Pupils were attending one of six schools in the province of Albacete (Spain), two of which were private or subsidized schools and four of which were public.

Instruments

The *school engagement measure* (SEM; Fredricks et al., 2004) is a multidimensional, 19-item instrument, which measures students' level of engagement in the academic environment on a 5-point Likert-type scale (1 = never or hardly ever, 2 = sometimes, 3 = often, 4 = many times, 5 = always or almost always). Exploratory factor analysis of the items in the original version resulted in three distinct subscales, corresponding to behavioral engagement (five items, e.g., "*I follow the rules at school*"), affective or emotional engagement (six items, e.g., "*My classroom is a fun place to be*") and cognitive engagement (eight items, e.g., "*I check my schoolwork for mistakes*").

The psychometric properties of the original version of the instrument showed adequate internal consistency for the items comprising the behavioral (α = .72-.77), affective/emotional (α = .83-.86) and cognitive (α = .82) subscales. Similarly, Reeve and Tseng (2011) developed a new measurement instrument in their study, which included a subscale corresponding to the agentic dimension. This fourth subscale consists of five items (e.g., "*I offer suggestions about how to make the class better*") and also showed adequate reliability (α = .82). A 7-point Likert-type response format (ranging from 1 = strongly disagree to 7 = strongly agree) was used for each item. However, the same response format as the previous instrument was also applied for the validation of this instrument in the present study in order to prevent confusion amongst participants.

Procedure

The process of translation and cross-cultural adaptation of the SEM and the agentic engagement scale to the Spanish language and context was carried out following guidelines and recommendations established at international level (Beaton et al., 2000).

Translation from the original language (English) into Spanish and reconciliation

In the first phase, the back translation method (Beeby, 1998) was used to obtain two independently translated versions of both instruments in Spanish. The translation was performed by two bilingual translators who had an excellent command of English and whose mother tongue was Spanish. The translators were familiar with the purpose of the validation process and the characteristics of the instruments. They were asked to stay true to the content of the original instrument, at a conceptual level, as closely as possible. This means that the translation had to be able to measure the same phenomenon as the instrument in its original language and be easy to understand by primary education students.

In terms of reconciliation, translators rated the difficulty they encountered when translating the items using a scale from 1 (no difficulty) to 10 (excessive difficulty). 70.8 % of the items presented little difficulty to translators (17 items rated between 0 and 4), 29.2 % presented moderate difficulty (7 items rated ≥ 4 and < 7) and none presented great difficulty (rated between ≥ 7 and 10). Based on

these data, a semantic, grammatical, cultural, conceptual and content review was carried out of each of the translated items and a single agreed version was produced in Spanish.

The final version of each of the items was decided upon via consensus by consulting two other researchers. For four items (2, 6, 10 and 17), identical translations were provided by both translators, the absence of discrepancies meant the translation was carried forward unaltered. For five items (4, 5, 11, 20 and 23), one of the proposed translations was accepted without requiring any changes. For these items, both translations were highly similar but the finally accepted translation contained one or more words which were considered more appropriate. For 15 items (all remaining items), one of the two proposed translations was accepted with minor modifications as it was believed that changing one or more words would improve and facilitate understanding of the item. As a result of this process, some disagreements arose around some items (7, 9, 14 and 19). These were resolved through discussion with a third researcher.

Back translation into the original language (English)

In the second phase, the agreed upon Spanish version was translated back into English independently by two bilingual translators: a university lecturer with expertise in English and a native English speaker. The translators were unaware of the original instruments so as to remain unbiased and rated the difficulty they encountered when translating the different items in the same way as in the earlier phase. Again, item translations were compared with the original versions in order to ensure that the content was conceptual the same by searching for inconsistencies or conceptual errors in the agreed upon version. Equivalence outcomes were assessed and discussed so as to reach a consensus between researchers. Controversy arose in relation to item 7 due to it being classified as lacking equivalence with regard to the original version. As a result, the validation process for this item was reinitiated, incorporating changes with the aim of increasing equivalence between the original and adapted versions. Finally, an accepted adaptation was produced.

Questionnaire administration to the sample

Prior to questionnaire administration, contact was made with the chosen educational centers, requesting permission to carry out data collection. Teachers of the participating school years were fully informed of the study procedure, characteristics and aims. Upon receiving their agreed to collaborate, teachers distributed the questionnaire to students during school hours. The questionnaire was completed anonymously and requested data on school enrolment, educational level, gender and age. Pupils could respond online (31.5%) or in person in written format (68.5%), as decided by their school and with both formats containing the same content. No time limit was placed on questionnaire completion; however, most students took no more than 10 minutes.

Statistical analysis

The statistical data analysis programs *SPSS 25* and *IBM AMOS 23* were used to analyze the psychometric properties of the SEM and the agentic engagement scale. Confirmatory factor analysis (CFA) was performed of all data ($N = 527$) in order to examine scale structure. The distribution of data pertaining to each of the items was examined according to skewness and Mardia's normalized multivariate kurtosis coefficient. Analyses were performed using the maximum likelihood estimation procedure. Model fit was analyzed according to various indices. Goodness-of-fit was examined using the chi-square scaling method (χ^2), with non-significant values indicating acceptable fit. However, as highlighted by Barrett (2007), this index is subject to large changes depending on sample size and deviations from the normal distribution of the data. In light of this, other statistical indices were also considered. For the interpretation of CFA indices, cut-points established by various authors (Kline, 2011; Arbuckle, 2017) were considered. These included degrees of freedom and their relation with chi-square (df/ χ^2, values < 5 are

acceptable, being excellent if < 2), root mean square error of approximation (*RMSEA* < .08), standardized root mean square residual (*SRMR* < .08), comparative fit index (*CFI* > .90) and Akaike's information criterion (*AIC*, with lower values indicating better fit). Similarly, descriptive statistics pertaining to all items were examined, alongside Pearson correlations between the different dimensions, and internal consistency coefficients of the four separate subscales and the scale as a whole.

Results

Final instrument: Academic engagement scale for primary education students (AES-PE)

The 24 items selected for the final scale are presented as supplementary material classified according to different dimensions. The scale was designed to be responded to along a 5-point Likert-type scale. Descriptive statistics pertaining to means, standard deviations, skewness and kurtosis were calculated for each item. Mean item scores ranged from $M = 2.63$ to $M = 4.67$, with standard deviations being close to one. Kurtosis and skewness value were within the acceptable ranges recommended by Kline (2015). Specifically, less than ± 10 for kurtosis and less than ± 3 for skewness. AES-PE data produced univariate skewness statistics ranging from -2.44 to 0.17 and univariate kurtosis ranging from -1.17 to 5.95. Nonetheless, Mardia's normalized multivariate kurtosis value was 120.68, indicating that study data showed a multivariate non-normal distribution. Maximum likelihood was, therefore the appropriate CFA estimation method (Rodriguez & Ruiz, 2008), especially considering the large sample size (Iacobucci, 2010).

Table 1 presents Pearson correlations between the four dimensions, with values ranging from r = .57 to .83.

Table 1. Pearson correlations between the different dimensions

Scale	Behavioral	Affective	Cognitive	Agentic
Behavioral	-	.70*	.69*	.57*
Affective		-	.80*	.72*
Cognitive			-	.83*
Agentic				-

Note. *p <.001.

Confirmatory factor analysis (CFA)

In relation to the present work, sufficient scientific basis was deemed to exist in the existing literature on AE to support the definition of the construct as being made up of four clearly defined, delimited and independent yet interrelated dimensions. A number of authors (Hau et al., 2003; Thompson, 1997) have indicated that CFA enables greater precision when it comes to defining the structure of a construct. Indeed, this technique is capable of correcting the deficiencies and limitations inherent to exploratory techniques, in accordance with other authors who have adapted instruments to the Spanish context (Ingles et al., 2012). For this reason, it was not considered necessary to conduct exploratory factor analysis (EFA), especially given that recent studies (Ramos-Díaz et al., 2016; Lara et al., 2018) have shown the same internal construct structure, comprising behavioral, affective/emotional and cognitive dimensions. Further, other studies (Cuevas et al., 2016) have considered the contributions of the agentic dimension, adding to the comprehensive measurement of the degree of engagement shown by students at school.

Based on the aforementioned internal structure, CFA was conducted of data collected from the total sample ($N = 527$), applying the maximum likelihood estimation procedure in order to identify the most appropriate factor structure. To this end, factor structure outcomes produced from the development of alternative plausible models incorporating the 24 items established to measure AE were compared.

In the first model (M_1) the scale corresponding to the agentic dimension was tested independently in relation to a single factor. The second model (M_2) consisted of three correlated factors (behavioral, affective/emotional and cognitive dimensions). The third model (M_3) comprised four correlated factors, corresponding to the scales describing the agentic, behavioral, affective/emotional and cognitive dimensions. The fourth model (M_4) examined a one-factor structure, considering whether AE referred to a single dimension which encompasses all aforementioned dimensions. Finally, the fifth model (M_5) included a higher-level factor which corresponded to general AE, alongside the four secondary factors that composed it. Outcomes for each of the models are shown in Table 2 and Figures 1 and 2.

Table 2. Comparison of CFA outcomes for the five AE models

	χ^2	df	χ^2/df	SRMR	RSMEA	CFI	AIC
One-factor (independent) model. M1: AE	12.15**	5	2.43	.01	.05	.99	42.15
Three-factor (correlated) model. M2: BE + EE + CE	473.28**	149	3.18	.05	.06	.95	555.28
Four-factor (correlated) model. M3: BE + EE + CE + AE	686.13**	246	2.79	.05	.06	.95	842.13
One-factor model (one-dimensional). M4: BE/EE/CE/AE	1519.39**	252	6.03	.06	.09	.85	1615.39
One higher level factor plus four secondary factors model. M5. (GE) = BE/EE/CE/AE	739.02**	248	2.98	.05	.06	.94	891.02

Note. **p <.05. χ^2 = chi-square; df = degrees of freedom; SRMR = standardized root mean square residual; *RMSEA* = root mean square error or approximation; *CFI* = comparative fit index; *AIC* = Akaike's information criterion; AE = agentic engagement; BE = behavioral engagement; EE = affective/emotional engagement; CE = cognitive engagement; GE = general academic engagement.

With regards to the goodness-of-fit of each of the five proposed models, models were observed to differ significantly from each other. M_4, which conceived AE as a one-dimensional factor, could not be confirmed as it did not produce acceptable indices. The remaining models (M_1, M_2, M_3 and M_5) showed good levels of fit. Whilst *p-values* were all significant, all remaining indices indicated model adequacy. Interestingly, when examined separately, M_1, corresponding to the agentic dimension, and M_2, corresponding to the behavioral, affective/emotional and cognitive dimensions, showed better fit than when combined together (M_3). As the two models are not mutually exclusive, this suggests that AE is more accurately measured when the traditional and novel dimensions are considered independently.

Figure 1 presents the structure examined via CFA for each of the five proposed models. Correlations between factors are presented, alongside the standardized factor loadings of each of the items on the factors to which they belong. Item numbers correspond to the resulting instrument included in supplementary material.
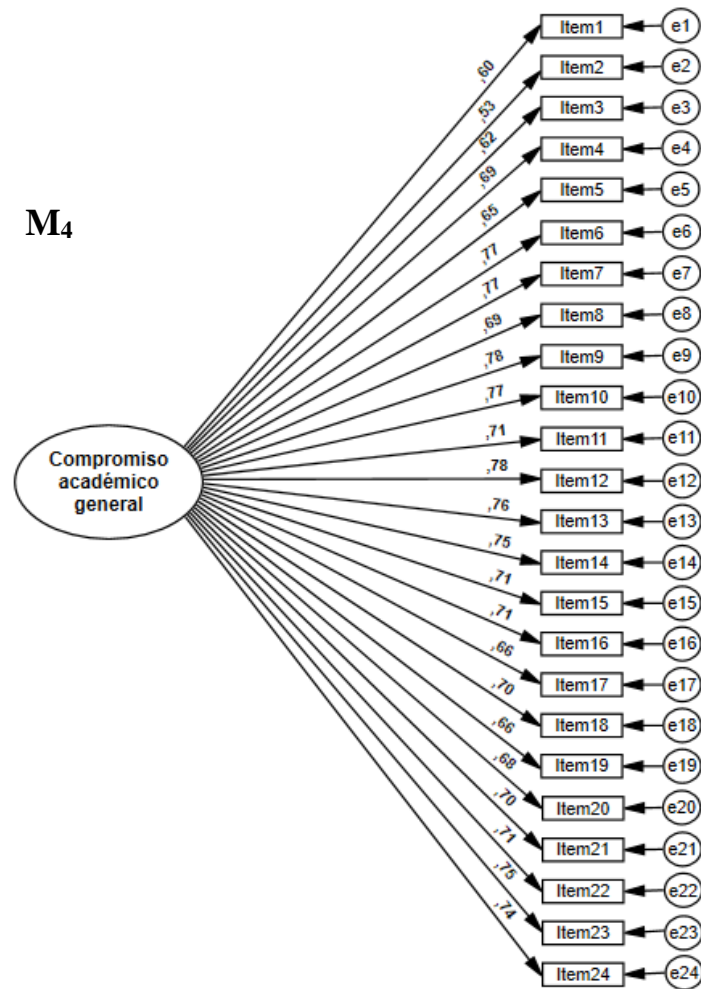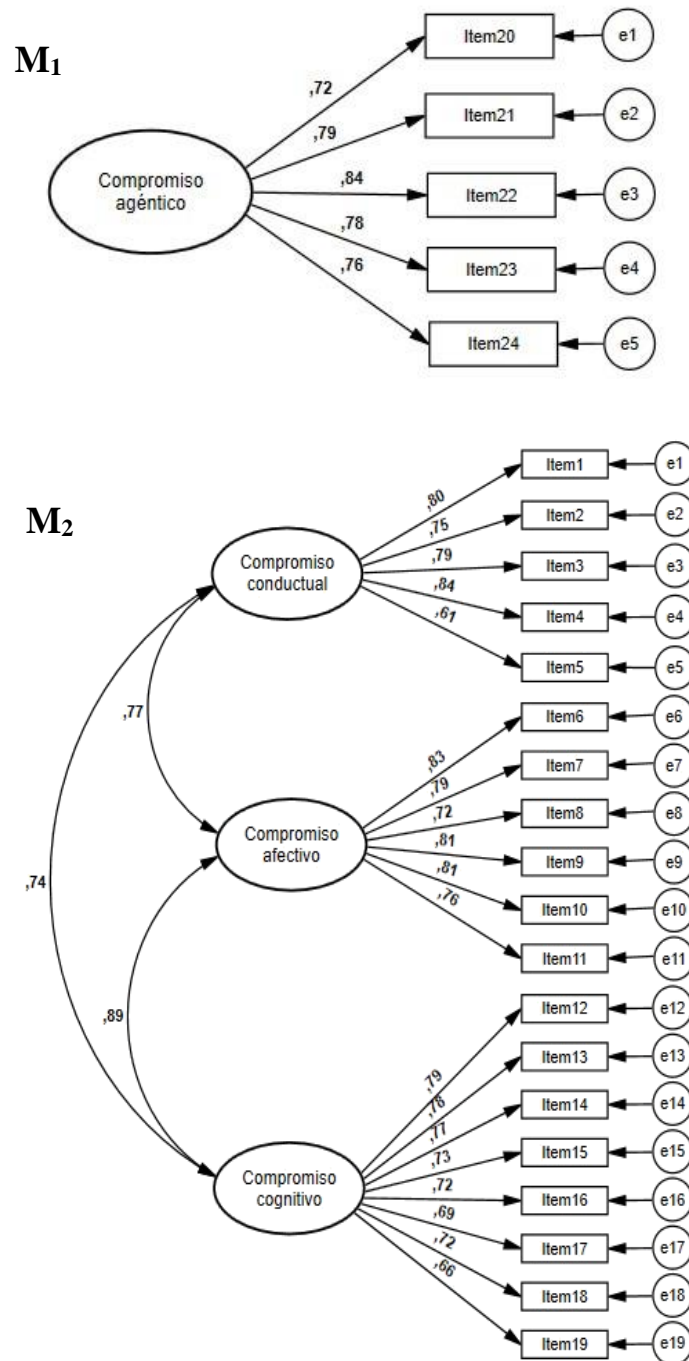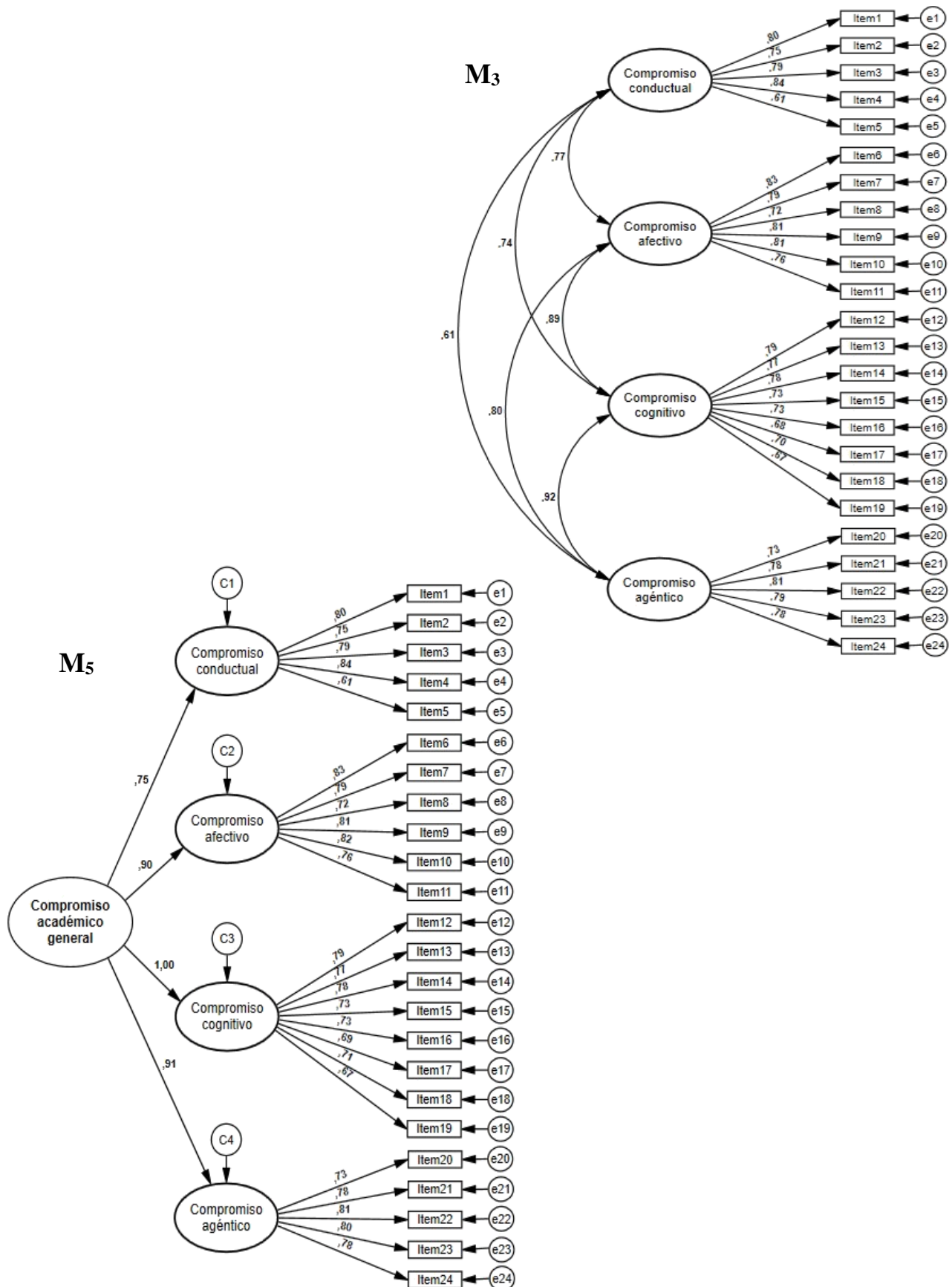
Figure 1. CFA model with unfavorable outcomes

Figura 2. CFA models with favorable outcomes

(Figure 2 continued)
CFA models with favorable outcomes

Reliability

With regards to internal consistency of the instrument, analyses were conducted for each of the subscales and the overall scale as a whole. Based on existing criteria for interpreting Cronbach alpha coefficients (George & Mallery, 2003), behavioral ($\alpha = .85$) and agentic ($\alpha = .88$) dimensions produced adequate ordinal alpha values, whereas the affective/emotional ($\alpha = .90$) and cognitive ($\alpha = .90$) dimensions produced excellent indices, as did the overall scale ($\alpha = .95$). Furthermore, detailed analysis of each of the 24 items composing the overall scale revealed that each item contributed to a general improvement in internal consistency.

Discussion

The study of student AE is increasingly becoming a topic of interest for research in the field of educational psychology. Despite the progress achieved in examining this construct, a clear lack of research has sought to examine student AE early educational stages. This fact becomes even more evident when the specific context of the present study, pertaining to Spanish pupils enrolled on primary education, is considered. In this regard, the aim of the present study was to carry out a cross-cultural validation and adaptation of two important instruments for measuring AE (Fredricks et al., 2004; Reeve & Tseng, 2011) in the Spanish context, targeting pupils aged between 8 and 13 enrolled at this stage.

Final outcomes indicated adequate levels of internal consistency and supported the proposed factor structure of the Spanish version of the instrument. Similar outcomes were produced to those achieved for the original versions and to those obtained by other studies which validated these instruments in other contexts and for other educational levels (Ramos-Díaz et al., 2016; Cuevas et al., 2016). This agreement between outcomes enables adequacy of the instrument to be confirmed. With regards to reliability of the instrument, obtained values revealed good levels of internal consistency for each of the four included dimensions, both independently and for the overall scale as a whole.

Based on results obtained in this study, the academic engagement scale appears to be a valid and reliable instrument for assessing AE in the Spanish population enrolled on the third grade or higher of primary education. Nonetheless, the factor structure of the scale differed depending on the different models proposed. The AE model consisting of three dimensions (behavioral, affective/emotional and cognitive) is currently the most widely accepted (Veiga et al., 2014). However, a growing body of research supports the addition of the agentic engagement as a fourth dimension to explain the overall concept of this construct, allowing for a more complete understanding of the degree of engagement.

Thus, a key element of the present study was to determine whether the underlying structure of the AES-PE was composed of four dimensions. Analyses confirmed the existence of four first-order factors, with adequate values being produced when considered according to a correlated structure (M_3) or as a single higher order factor (M_5). The four-factor correlated model (M_3) indicated that the behavioral, affective/emotional, cognitive and agentic dimensions of engagement are interrelated yet independent and can be distinguished separately. This opens the way for further research into the contributions made by each of dimension in isolation. On the other hand, the one-factor model (M_5) allows for a global analysis and measurement of AE, understanding it as a single concept. This may be useful for identifying potential implications with regards to other determinants found in the school context, such as academic achievement (Ramos-Díaz et al., 2016) or school perfectionism (Kljajic et al., 2017). However, it was observed that models in which the agentic engagement (M1) was separated from the behavioral, affective/emotional and cognitive dimensions (M2) achieved better levels of fit. Thus, measurement appears to be more accurate when conducted independently, despite dimensions not being mutually exclusive. Bearing this in mind, AE is likely

best described as the outcome of the interaction between four independent factors: behavioral, affective/emotional, cognitive and agentic engagement. Consequently, empirical outcomes corroborate this conclusion, with validity and adequacy indices verifying that the instrument accurately measures the four dimensions of AE.

The resulting scale (AES-PE) is presented as a useful tool in the educational field making it possible to measure AE and understand the causes of student behavior and predispositions towards their teaching-learning process (Tarabini et al., 2018). Student engagement is being increasingly accepted as one of the keys for addressing issues such as underachievement, boredom, school disaffection and high dropout rates, as well as for identifying students who are already highly engaged (Rodríguez-Fernández et al., 2016). The identification and understanding of the reasons behind student engagement provides relevant information for educational institutions and government policy (Wang & Hofkens, 2020), enabling them to optimize learning practices and experiences in schools. Thus, AES-PE can be used as a powerful tool to acquire quality information on student engagement from an early age. This will enable correct decision-making by those involved in the teaching-learning process and help them to be more responsive to students' needs.

Finally, it is worth mentioning some limitations of the present study. Firstly, a pilot test of the instrument could not be performed prior to distributing the questionnaire to the sample due to the difficulty in accessing educational centers as a consequence of the current health crisis caused by COVID-19. However, this was not considered essential as the instrument had already been created and validated in Spanish with students at later educational stages (Ramos-Díaz et al., 2016). Furthermore, CFA outcomes confirmed the adequacy of the instrument. Similarly, the sample was selected according to convenience, recruiting available and willing schools to participate in the present study. In order to achieve greater representativeness and external validity, it would be interesting to analyze the psychometric properties of the instrument in larger samples and via random sampling in more diverse contexts. Additionally, instrument reliability would be further supported by verifying its stability over time in longitudinal studies.

Further, potential lines of future research pertaining to examination of the AE construct should be highlighted. In this regard, AE has been described as encompassing a set of contextual conditioning factors which must be taken into consideration in order to define it. Thus, it would be useful to analyze the way in which other variables present in the educational setting influence engagement. Last but not least, the wording of instrument items did not target any specific subject area. Such an approach, would allow for a more thorough analysis of the degree of AE presented by students in specific subjects on the school curriculum. This would provide more in-depth information pertaining to different school disciplines, which is important given that students likely differ significantly in their level of commitment to different subjects. Content-based examinations are typically used to measure student academic performance. Nonetheless, assessing only this aspect can be problematic and insufficient for several reasons (Leet et al., 2017). Firstly, students may see themselves as less competent and start to focus on certain areas of interest, meaning that average grades do not correspond with actual ability. Secondly, students who exert little effort but achieve relatively high grades will likely not exploit their potential (Park et al., 2007, Wai et al., 2009). Landis & Reschly (2013) provided an example of this by highlighting that lack of engagement among gifted students was associated with underachievement and early school-dropout. Thus, performance assessments via the examination of grades and the consideration of engagement will be fundamental to understanding academic outcomes more comprehensively.

In summary, findings of the present study support the use of a Spanish version of an AE scale with primary education students and suggest that it is a valid and reliable instrument for measuring student AE in the school setting *(the scale can be consulted in the supplementary material).*

Funding

Acknoledgements

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Supplementary material

Academic engagement scale for primary education students (AES-PE)
Escala de Compromiso Académico para alumnado de Educación Primaria (ECA-EP)

Ítems	Opciones de respuesta				
	Nunca o casi nunca	Algunas veces	A menudo	Muchas veces	Siempre o casi siempre

Dimensión conductual
1. *Respeto y cumplo las normas del colegio*
2. *En el colegio me meto en problemas (I)*
3. *Cuando estoy en clase, finjo que estoy trabajando (I)*
4. *Presto atención en clase*
5. *Termino mis tareas a tiempo*

Dimensión afectiva/emocional
6. *Me gusta estar en el colegio*
7. *Me gusta mucho el trabajo que hago en el colegio*
8. *Mi clase es un sitio divertido para mí*
9. *Me interesan las tareas que hago en el colegio*
10. *En el colegio me siento feliz*
11. *En el colegio me aburro (I)*

Dimensión cognitiva
12. *Repaso mis deberes por si he cometido algún error*
13. *Estudio en casa incluso cuando no tengo ningún examen*
14. *Intento ver en Internet o en la TV programas y videos sobre cosas que hacemos en el colegio*
15. *Cuando leo un libro, me hago preguntas a mí mismo para asegurarme de que entiendo de que trata*
16. *Además de los del colegio, leo otros libros por mi cuenta para aprender más sobre las cosas que vemos en clase*
17. *Si no conozco el significado de una palabra cuando estoy leyendo, hago algo para averiguarlo*
18. *Si no entiendo lo que leo, vuelvo atrás y lo leo de nuevo*
19. *Hablo con gente fuera del colegio sobre lo que estoy aprendiendo en clase*

Dimensión agéntica
20. *Durante la clase, hago preguntas*
21. *Le digo a mi profesor lo que me gusta y lo que no me gusta*
22. *Le hago saber a mi profesor qué cosas me interesan*
23. *Durante las clases, expreso mis preferencias y opiniones*
24. *Hago sugerencias sobre cómo mejorar las clases*

Nota. (I) = ítem inverso.

Aclaraciones: Para la administración del cuestionario a la muestra se presentaron los ítems siguiendo el orden numerado. No se incluyeron los títulos de cada dimensión.

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