



Social-emotional and character development scale (SECDS): validation of a Spanish version in low-income communities with racially and ethnically diverse youth

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Received: 18 September 2023 / Accepted: 9 June 2025 / Published online: 1 July 2025
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Abstract

Social-emotional skills can help students overcome learning challenges and prevent at-risk or problematic behaviors as well as promote their overall well-being and psychological growth. Despite the recent evolution of intervention programs targeting social-emotional skills, psychometrically sound and effective assessment tools remain limited. The focus of this study is the Social-Emotional and Character Development Scale (SECDS), a self-reported rating scale developed by Ji et al. (*Inf Age Publ* 9:121–147, 2013). To date, only a few studies have validated an instrument measuring social-emotional skills in a Spanish student sample. Accordingly, the main objective is to examine the validity and reliability of the SECDS in a Spanish-speaking context. The sample consisted of 264 students ranged in age from 8 to 17 years old in geographically diverse locations throughout the Basque Autonomous Community in Spain. The findings confirm the scale's multidimensional and hierarchical structure, as well as its reliability for assessing social-emotional skills in this age group. The correlated-factor model showed a superior fit, outperforming alternative models. Internal consistency was satisfactory across most subscales, with some variability reflecting challenges in measuring dimensions with fewer items. Importantly, the adaptation process included recommendations to use a 5-point Likert scale to better capture the developmental level of secondary-aged students. This study provides support for a translation and adaptation of the SECDS for use with primary and secondary students, addressing a critical gap in the availability of robust assessment instruments for Spanish-speaking populations. Additionally, it advances cross-cultural research in the field, enabling international comparisons and fostering understanding across diverse educational contexts.

Keywords Social-emotional skills · Character development · Assessment · Self-reported scale · Disadvantaged students

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1 Introduction

Students' social-emotional skills can play a key role in today's rapidly changing society and labor market. Social-emotional skills are a crucial prerequisite for students' successful participation in school and the wider community. Strengthening these competencies can yield important benefits in different spheres of the individuals' life and therefore in the society as a whole (Chernyshenko et al., 2018; Durlak et al., 2015; Guerra et al., 2014; Pancorbo et al., 2020). Social-emotional skills can help students overcome learning challenges and prevent at-risk or problematic behaviors as well as promote their overall well-being and psychological growth (Salmela-Aro & Upadyaya, 2020; Taylor et al., 2017). As a result of these trends, increased efforts to develop intervention programs and aligned assessment systems targeting social-emotional skills in school-aged children and adolescents have been reported (Durlak et al., 2022; Elliott et al., 2022; Thomson et al., 2018).

1.1 Measurement of social-emotional skills

There is a great variety of instruments measuring social-emotional skills designed for different purposes and functions. Broadly, these assessments can be categorized into direct and indirect methods based on the technique used and the informants involved. Direct assessment involves assessing student performance against a quantifiable learning outcome while indirect assessment involves gathering data through means other than scoring learner task performance (Elbeck & Bacon, 2015). Direct assessments include third-party behavioral observations or performance tasks, whereas indirect assessments often include behavior rating scales completed by teachers/staff, students or parents (LeBuffe et al., 2018). Each type of assessment has its strengths and shortcomings. While direct assessment can target a smaller number of behaviors and require time for training (Naglieri et al., 2013; Soland et al., 2019), indirect assessment can be biased because of participants' subjectivity (Kankaraš et al., 2019).

Among indirect assessment methods, self-report rating scales are a primary tool for evaluating social-emotional skills, which allow individuals to evaluate their own behaviors and emotions (Greenberg, 2023; Murano et al., 2021). Self-report rating scales are useful for recognizing strengths and areas for improvement. They offer a simple and efficient way to collect data, providing an affordable and quick approach to assessment (Kankaraš, 2017). Beyond self-reports, teacher and parent rating scales provide complementary perspectives on children's social-emotional competencies. Teachers, for instance, frequently use adult-completed behavior rating scales to evaluate students' social-emotional skills based on their classroom interactions and behaviors (Elliott et al., 2018; LeBuffe et al., 2018; Merrell et al., 2011). Similarly, parents' assessments provide valuable additional data, drawing on their observations of emotional regulation and social behaviors in home and community settings (Elliott et al., 2022).

Direct assessment methods include performance-based assessments, which evaluate social-emotional skills through observable responses to tasks or scenarios. These assessments involve structured tasks that simulate real-life challenges, enabling evaluators to examine specific competencies such as problem-solving, emotional regulation, and interpersonal communication in a controlled environment (Abrahams et al., 2019). Performance-based assessment such as role-playing scenarios and situational judgment tests, offer a dynamic alternative to conventional rating scales (DeRosier & Thomas, 2018;

McKown, 2019). In addition to that, third-party observations focus on capturing naturalistic behaviors in everyday contexts, such as classrooms or group activities, where individuals are not required to engage in predefined tasks. These observations, conducted by trained evaluators, teachers, or parents, provide insights into how individuals regulate emotions and interact with others in authentic situations (Soland et al., 2019).

1.2 Challenges in the measurement of social-emotional skills

Despite the variety of assessment tools available to assess social-emotional skills, effectively assessing these competencies presents several challenges. An extensive body of literature has identified various conceptual and methodological challenges of social-emotional skills measurement. One emerging challenge lies in the recent development toward strength-based approaches, which may conflict with clinically derived assessment tools such as the Child Behavior Check List (CBCL; Achenbach, 1991) or the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1994). This progression emphasizes student's strengths and psychological growth over traditional disorder-driven approaches (Abrahams et al., 2019). Despite this paradigm shift toward strength-based approaches to assessment of social-emotional skills, screening for vulnerabilities continues to play a key role in school contexts. Multiple instruments measuring social-emotional skills are deficit-based and focus on individuals' problematic behaviors, particularly oriented to the use of school counsellors or psychologists (Buckley & Epstein, 2004; Crowder et al., 2019; Gresham et al., 2020; Malti et al., 2018; Merrell et al., 2008).

Another conceptual challenge is the lack of consensus on the conceptualization and categorization of social-emotional skills. Multiple terms referring to social-emotional skills range from emotional intelligence by Salovey and Mayer (1989) or emotional literacy by Park et al. (2003) to social-emotional learning (SEL) by CASEL. In addition to that, there is considerable heterogeneity on the number and nature of the underlying factors of social-emotional skills. In most cases, instruments intending to measure social-emotional skills vary depending on the selected theoretical framework and build on different social-emotional skills' definitions and dimensions (Abrahams et al., 2019; Murano et al., 2021; Pancorbo et al., 2020).

Methodological challenges primarily stem from the subjective nature of social-emotional skills. A significant challenge is the reliance on self-report measures, which are prone to biases like self-perception and social desirability, leading students to overestimate or underestimate their abilities and produce inaccurate assessments. Teacher and parent rating scales can also reflect their subjective perceptions and expectations of the student, potentially failing to capture the student's true level of social-emotional skills (McKown, 2019). In addition to that, the development of universally applicable scales for assessing social-emotional skills is challenging due to cultural variations in how these skills are expressed and perceived. A major obstacle is reference bias, where individuals interpret identical questions differently depending on their cultural context (Kankaraš, 2017). Observational and performance-based assessment methods are effective but require significant training and can be time-consuming. These performances usually result in a single score, making them more prone to situational factors and unrelated influences, which can amplify measurement error or bias (LeBuffe et al., 2018; Soland et al., 2019). These challenges underscore the need for more inclusive, reliable, and culturally sensitive approaches to measuring social-emotional skills.

1.3 Socioeconomic disparities in social-emotional skills measurement

Socioeconomic status (SES) plays a significant role in shaping children's social-emotional skills and can also influence the ways in which these skills are assessed. Assessment tools may not fully account for the diverse ways in which social-emotional skills manifest across different socioeconomic contexts, potentially leading to biased interpretations. Socioeconomic factors, especially family background, profoundly impact a child's social-emotional development and educational outcomes (Martínez-Yarza et al., 2024). A number of studies have extensively acknowledged the academic difficulties experienced by children from disadvantaged households. However, the potential disadvantages experienced by students from low-income families regarding social-emotional skills and personality traits have largely been overlooked, unless specific deficiencies or problematic behaviors were identified (Lechner et al., 2021; Poortvliet, 2021; Spengler et al., 2015).

Data show that students from disadvantaged families encounter greater obstacles to achieving the same outcomes as those from more advantaged households, including the development of their social-emotional skills. Results from a latent factor analysis by Gershoff et al. (2007) provided support for a model where family income and material hardship were positively associated to children's social-emotional skills through parent-mediated paths. Steele et al. (2015) found that a low socioeconomic family background was a significant predictor of emotional and behavioral difficulties in children aged 4 to 7. Poortvliet (2021) determined differences in students' social-emotional skills based on their SES. Children from lower socioeconomic backgrounds scored systematically worse than their more advantaged peers in social-emotional skills, and these differences widened as they progressed in school. Similarly, the results of the piecewise latent growth modeling by Lee et al. (2024) revealed that boys (compared to girls), Black students (compared to White students), Hispanic students (compared to White students), and low-income students (compared to middle-to-high-income students) experienced lower level of social-emotional skills during elementary school years. Understanding the factors that influence the assessment of social-emotional skills is essential to ensuring equitable and accurate evaluations for all students.

1.4 The social-emotional and character development scale (SECDS)

The main objective of this paper is to examine the validity and reliability of the social-emotional and character development scale (SECDS) in a Spanish student sample. The SECDS is a self-reported rating scale originally developed by Ji et al. (2013) and is intended to measure different dimensions of students' social-emotional skills and character. Grounded in the social and emotional learning (SEL) and social-emotional and character development (SECD) conceptual frameworks, the SECDS emphasizes skills and behaviors such as prosocial behavior, honesty, self-improvement, self-control, and respect for rules at school and at home. The scale was developed as part of a research project evaluating the impact of positive action (PA), an intervention program targeting social-emotional skills and character, conducted within Chicago Public Schools.

The SECDS includes 28 items and consists of six dimensions: prosocial behavior, honesty, self-control, self-development, respect at school and respect at home. The response format uses a four-point scale with simplified response anchors (0=NO!, 1=no, 2=yes, 3=YES!). Ji and colleagues (2013) investigated the factor structure of

the SECDS as well as its reliability and validity with a sample of elementary school-age students. Results from confirmatory factor analysis supported the second-order factor structure yielding adequate fit indices with CFI and TLI values above 0.90 and RMSEA values below 0.08. Internal consistency coefficients for the six factors were also acceptable (0.70 or greater). As evidence of the SECDS criterion-related validity, general and individual scales were associated with measures of expected correlates of social-emotional skills and character such as self-reported grades, measure of anxiety and risk behavior.

More recently, Ji and colleagues (2021) extended the validation of the SECDS to a sample of middle school students. Confirmatory factor analyses again supported the second-order factor structure, though minor adjustments (e.g., reducing the Likert scale from four to three points for certain items) were required to optimize model fit for adolescents. Reliability remained strong across all six dimensions, with internal consistency coefficients consistently above 0.70 in the middle school sample. Validity analyses in Ji et al. (2021) showed expected correlations between SECDS scales and academic performance, life satisfaction, health behaviors, prosocial peers, and reduced risk behaviors.

1.5 The present study

The need to measure students' social-emotional skills has grown worldwide in the latter part of the twentieth century (DeRosier & Thomas, 2018; LeBuffe et al., 2018; Mantz et al., 2018). Despite this growing international interest, the accurate assessment of social-emotional competencies remains a challenge, highlighting the need for reliable instruments to monitor skill development and evaluate intervention outcomes (Murano et al., 2021; Walton et al., 2022). Accordingly, the importance of engaging in investigations of psychometrically sound and effective assessment tools and systems is highlighted. This need is particularly pressing in Spain, where an emphasis on test-based and results-driven accountability often overshadows the development of broader skills like social-emotional competencies (Fernández Navas et al., 2017; Verger et al., 2020). In addition to that, the development of social-emotional skills in Spain largely relies on individual initiatives rather than systemic national or regional approaches, leaving significant gaps in assessment and consistent measurement (Aguilar et al., 2019).

To date, only a few studies have validated an instrument measuring social-emotional skills in a Spanish student sample. The present paper aims to address this gap to support practitioners in their efforts to lead social-emotional skills assessment in school contexts. The main objective of this paper is to examine the validity and reliability of the SECDS in a Spanish student sample. This study has four specific aims. First, it aims to translate and adapt the SECDS into the Spanish language and sociocultural context. Second, it seeks to confirm the SECDS's factor structure as established by Ji et al., (2013, 2021). Third, it aims assess the instrument's reliability. Finally, it aims to examine the variability in SECDS's scores as a function of gender and educational level.

Based on these objectives, the study hypothesizes that:

- Hypothesis 1: The SECDS will exhibit a factor structure consistent with the model proposed by Ji et al., (2013, 2021), as demonstrated by acceptable CFA fit indices.
- Hypothesis 2: The SECDS will demonstrate high reliability, supported by strong internal consistency across all factors.

- **Hypothesis 3:** Significant differences in SECDS scores will be observed based on gender and educational level, reflecting variability in social-emotional skills across these groups.

2 Method

2.1 Description of the sample

The original sample consisted of 267 students ranged in age from 8 to 17 years old ($M=11.7$, $SD=2.61$) in geographically diverse locations throughout the Basque Autonomous Community in Spain. The participants in this study were selected based on their involvement in the CaixaProinfancia program, a social and educational intervention led by Obra Social “la Caixa” Foundation (Santibáñez Gruber & Laespada Martínez, 2016). This program was selected because it specifically targets children and adolescents from economically vulnerable families, providing a unique opportunity to study social-emotional skills development within a population that faces significant socioeconomic challenges. Initially, the program was implemented in the 10 most populous Spanish regions with the highest child poverty rates, including the Balearic Islands, Barcelona, Bilbao, Gran Canaria, Madrid, Málaga, Murcia, Seville, Tenerife, Valencia, and Zaragoza. Over the years, the program has expanded to include many other Spanish cities, now covering the entire country. CaixaProinfancia targets children and adolescents aged 1–19 years old, whose families face economic hardship and social exclusion, meeting the national threshold for poverty risk. The program focuses on the holistic development of both children and their families through community action networks and offers services like psychological support, educational assistance, and health promotion.

Random sampling was used to ensure that the sample accurately represents the population and to improve the generalizability of the research findings to the larger population. The sample selection was guided by two main criteria: (1) including 80% of all students enrolled in the program, and (2) starting with 8-year-olds who have the minimum reading level necessary to independently complete the questionnaire. These criteria were established in collaboration with the program coordinator from the CaixaProinfancia program to ensure consistency with the program’s objectives and guarantee operational feasibility. Among the original sample of students, 3 (1.1% of the sample) were discarded because responses on items were missing or responses were invariable. Respondents with more than 10% of the total items left in blank were discarded as well as respondents with an invariable response pattern set at a minimum threshold of $SD > 0.2$ in a set of heterogeneous items. Accordingly, the final sample consisted of 264 students from 8 to 17 years old.

This study included students from both primary and secondary school years to examine the trajectories of the study variables. The wide age range (8–17 years) was crucial for exploring developmental differences in social-emotional skills across key educational transitions and aligns with prior validation studies of the SECDS for elementary and middle school students (Ji et al., 2013, 2021). Participants in this study were 128 students enrolled in primary education and 90 students enrolled in secondary education. For the remaining 46 students, it was not possible to determine whether they were enrolled in primary or secondary education due to the absence of a response to the specific question on students’ grade level. The sample was 45.9% female and was mainly comprised of students with an immigrant background. The following distinction was made between foreign-born and

native-born students based on the OECD distinction (OECD, 2018). Based on students' responses on demographic items of the questionnaire, 41.7% of students were second-generation immigrant students (students born in Spain whose parents are both foreign born), 37.7% first generation immigrant students (foreign-born students whose parents are both foreign-born), 14% native students (students born in Spain whose parents are both native-born) and 6.5% native students with mixed heritage (students born in Spain who have one native-born and one foreign-born parent).

When completing the questionnaire, students were also asked to indicate the language of schooling. There are three main types of schooling depending on the language of instruction in the Basque Autonomous Community:

- Education is entirely in Spanish, teaching Basque as a mandatory subject (A language model).
- Education is primarily in Basque, with subjects such as mathematics and literacy taught in Spanish (B language model).
- Education is entirely in Basque, teaching Spanish as a mandatory subject (D language model).

The present sample was characterized by the majority of students attending D language model (64.1%). 28.1% of students were attending B language model and a minority of 7.8% of students were attending A language model. Table 1 provides demographic data by grade level for the entire primary sample of students who had complete data on the SECDS measure. Table 1 only reports valid data. Sociodemographic information about a few cases was not available.

2.2 SECDS measure

Social-emotional skills of primary and secondary school-age students were measured using the Spanish adaptation of the SECDS, developed by the authors. This questionnaire is

Table 1 Demographic data of the student sample by grade level

Student participants	Primary education		Secondary education		Total	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Full sample	128	58.7%	90	41.3%	218	100%
Gender						
Female	55	25.5%	44	20.4%	99	45.9%
Male	71	32.9%	46	21.3%	117	54.2%
Origin						
First generation	42	21.1%	33	16.6%	75	37.7%
Mixed heritage	7	3.5%	6	3%	13	6.5%
Native students	16	8%	12	6%	28	14%
Second generation	51	25.6%	32	16.1%	83	41.7%
Language of schooling						
A (mainly Spanish)	5	2.3%	12	5.5%	17	7.8%
B (mixed)	35	16.1%	26	12%	61	28.1%
D (mainly Basque)	87	40.1%	52	24%	139	64.1%

intended to measure different dimensions of students' social-emotional skills and character. It includes 25 items and consists of six dimensions: (1) prosocial behavior, (2) honesty, (3) self-control, (4) self-development, (5) respect at school and (6) respect at home. The prosocial behavior dimension (5 items; $\alpha=0.71$) assesses the ability to empathize with others and build positive peer relationships. The honesty dimension (4 items; $\alpha=0.66$) measures skills for making truthful and appropriate decisions in social interactions. The self-control dimension (4 items; $\alpha=0.75$) evaluates the capacity to regulate thoughts and behaviors in various contexts, including stress management and self-discipline. The self-development dimension (4 items; $\alpha=0.76$) focuses on achieving personal and collective goals. The respect at school dimension (4 items; $\alpha=0.81$) captures adherence to rules and respectful behavior toward authority figures in educational settings, while the respect at home dimension (4 items; $\alpha=0.83$) assesses similar behaviors in family contexts. Responses are captured using a 5-point Likert scale ranging from 0 (strongly disagree) to 4 (strongly agree).

2.3 Procedure

2.3.1 Translation and adaptation of the SECDS

The translation and cultural adaptation of the SECDS into Spanish was carried out following a 4-step translation method consisting of the following steps: (1) translation, (2) back translation, (3) cultural adaptation and (4) pilot study. The general rules and recommendations for test translation and adaptation by the International Test Commission (International Test Commission, 2017) were employed for the present purposes.

During the translation phase, a bilingual researcher translated the SECDS questionnaire from English to Spanish, prioritizing a literal translation to maintain fidelity to the original content. Discrepancies arising from this translation were resolved with two other researchers with extensive experience in the field of educational sciences. The translated version was then back translated from Spanish to English by an independent bilingual translator to confirm the accuracy to the original SECDS questionnaire. The cultural adaptation was carried out with the collaboration of school administrators and research staff from the Basque Institute of Educational Evaluation and Research (ISEI-IVEI) under the Department of Education of the Basque Government. This process extended beyond ensuring linguistic accuracy, focusing on cultural relevance and appropriateness for the target population. This process entailed:

Content relevance: Evaluating the suitability of the instrument's items to reflect the lived experiences and sociocultural realities of the target population. Efforts ensured that questions resonated with students' everyday lives and avoided content that might be unfamiliar or irrelevant in the local context.

Language and clarity: Revising the wording of items to reflect colloquial language commonly used in Spain while maintaining clarity and simplicity appropriate for the target age group.

Cultural sensitivity: Identifying and addressing topics or phrasing that could be potentially sensitive, uncomfortable, or misinterpreted within the cultural framework of the target group. This included modifying or replacing examples and references to align with local cultural practices and norms.

Educational level: Adapting the instrument to reflect the developmental and educational levels of participants, ensuring accessibility and comprehension for both younger stu-

dents (aged 8) and older participants (aged 17). This included tailoring instructions and item phrasing to align with the reading and cognitive abilities across the age range. Involvement of program coordinators from the CaixaProinfancia program was instrumental in identifying and addressing potential barriers to understanding or engagement.

This multifaceted approach ensured the instrument's cultural and contextual appropriateness, facilitating its effectiveness and reliability within the intended population.

Concerning the pilot study, the instrument was initially administered to a pilot sample composed of five students to evaluate the adequacy of the language and response time. Some students received assistance from researchers while reading and responding to the questionnaire items to ensure comprehension. Other students completed the questionnaire independently and, at a later point, discussed with researchers how well they understood the items and whether they encountered any difficulties during the process. Primarily, researchers assessed whether the students understood the items and correctly used the four-point scale with simplified response anchors. The information obtained from the piloting phase served as a basis to further review the questionnaire.

A final Spanish version of the SECDS was produced implementing the recommendations and suggestions that derived from the previous phases. The final translation was composed of the original questionnaire with the exception of two items. These two items were removed due to concerns in the total response time, leaving the Spanish version of the SECDS with a total of 26 items. There were no major modifications in the item content. However, the wording of some items was slightly adapted to the target population as secondary school-aged students were included into the sample. The original measure, validated for students up to age 14, demonstrated reliability, requiring only minor adjustments to extend its applicability to the participants aged 14–17 in our study. Similarly, the original four-point scale with simplified response anchors (0=NO!, 1=no, 2=yes, 3=YES!) was converted into a 5-point Likert scale (0=strongly disagree, 1=disagree, 2=neutral, 3=agree, 5=strongly agree) to capture the developmental level of secondary-aged students.

2.3.2 Data collection

Operational units of the CaixaProinfancia program in the Basque Autonomous Community oversee the coordination and delivery of services to participating families. These units were invited to take part in the survey on a voluntary basis. Once an operational unit agreed to take part, a designated contact person was assigned to coordinate the data collection process. To ensure an adequate sample size for each operational unit, program staff were instructed to survey 80% of the students enrolled in the program. The students were selected through a random selection procedure, focusing on those who participated in the CaixaProinfancia program between January and May 2022.

The questionnaire was administered to small groups of participants during after-school hours as part of the CaixaProinfancia program, under the supervision of program staff. It was conducted in Spanish for all participants, ensuring anonymity, and students were informed of their right to withdraw from the study at any time. The entire process took approximately 20 min. Students were encouraged to seek help from program staff if needed. The questionnaire was delivered online using the Qualtrics platform, and participants had to read and accept the informed consent form before proceeding. Once completed, the data were compiled and prepared for statistical analysis.

2.3.3 Ethical considerations

This research was conducted with the review and approval of the Research Ethics Committee at the institution where the authors are affiliated. Appropriate research approvals were also obtained from the families of students participating in the survey and from the officials representing the CaixaProinfancia program in the Basque Autonomous Community.

2.4 Data analysis

To address the research objectives of the present study, a series of psychometric analyses were performed. Based on the analysis plan specified by Ji et al. (), a confirmatory factor analysis (CFA) was conducted to confirm the proposed second-order model (M_1) consisting of six second-order factors (prosocial behavior, honesty, self-control, self-development, respect at school and respect at home), and a higher-order factor of social-emotional and character development. The second-order factor model was fitted to the data. The 26 SECDS items were allocated into their respective factors and were nested within a second-order factor. The fit of this model was then compared with two alternative models. On the one hand, a single-factor model that had all 26 items loading into a single factor (M_2). On the other hand, a correlated-factor model (M_3) where all 26 items were allocated to their respective factors and all potential correlations between the six factors were specified.

CFAs were performed using Jamovi statistical software and a SEM analysis module (Gallucci & Jentschke, 2021; Rosseel, 2012; The jamovi project, 2023). Given the ordinal nature of the data, diagonally weighted least square (WLSMV) method was applied. This approach can be employed with small data samples, big models, as well as skewed and ordinal data (Mindrila, 2010). The goodness of fit of the hypothesized and competing models was assessed using the following indices: the root-mean-square error of approximation (RMSEA), comparative fit index (CFI), Tucker-Lewis index (TLI), and the standardized root-mean-square residual (SRMSR). RMSEA values equal or less than 0.08 indicate acceptable model fit and values less than or equal to 0.05 indicate good model fit. CFI and TLI values of at least 0.90 indicate acceptable model fit and values of 0.95 or greater indicate good model fit. The acceptable values for the SRMR index are less than 0.08 (Hu & Bentler, 1999; Yu, 2002). In addition to that, the chi-square difference significance test was performed to compare the fit of the hypothesized second-factor model with the two alternative models. Reliability indices were also calculated for the six factors of students' social-emotional skills and character traits. Internal reliability was assessed via Cronbach's α and McDonald's ω indices.

3 Results

This section presents the study's results, structured around the research hypotheses. First, we assess the hypothesized factor structure of the SECDS using confirmatory factor analysis (CFA) to evaluate its alignment with the model proposed by Ji et al., (2013, 2021). Next, we assess its reliability through internal consistency coefficients. Finally, we analyze score differences across demographic groups, specifically gender and educational level.

Hypothesis 1 *The SECDS will exhibit a factor structure consistent with the model proposed by Ji et al., (2013, 2021), as demonstrated by acceptable CFA fit indices.*

Confirmatory factor analysis yielded acceptable fit of the hypothesized second-order factor model M_1 : $\chi^2=519$, $p<0.001$; RMSEA=0.055; SRMR=0.075; CFI=0.985 and TLI=0.983. Item factor loadings were all-substantial (i.e., >0.49) except for item number 6. The low factor loading indicated a need to reformulate the hypothesized second-order factor model by eliminating item 6 ($\beta=0.28$, $p<0.05$). The deletion of this item is consistent with the underlying conceptual framework considering that the item's content refers to a personality trait instead of describing a behavior as the rest of the items do: I am a good friend to others ["Soy un buen amigo/a"]. The analysis of this modified second-order factor model yielded also acceptable fit indices: M_{1a} : $\chi^2=498$, $p<0.001$; RMSEA=0.058; SRMR=0.070; CFI=0.985 and TLI=0.983.

Based on the same reasons, item number 6 was also eliminated from the other two alternative models for potential comparisons. The single-factor model (M_2) indicated non-positive definite fit. The difference test was not conducted for the single-factor model because the model demonstrated unacceptable model fit. However, the correlated-factor model (M_3) demonstrated a good fit: $\chi^2=359$, $p<0.001$; RMSEA=0.040; SRMR=0.061; CFI=0.993 and TLI=0.992. The difference test comparing the second-order factor model to the correlated-factor model was significant, suggesting a superior fit for the correlated-factor model. Table 2 presents the fit statistics for the three-factor models.

The results provided support for Hypothesis 1, confirming that the SECDs exhibits a factor structure consistent with the model proposed by Ji et al. (). The CFA revealed that the second-order factor model (M_1) demonstrated acceptable fit indices; however, the correlated-factor model (M_3) emerged as the superior solution, supported by stronger statistical fit. While our findings indicate good fit for the second-order structure, they slightly diverge from Ji and colleagues' conclusion that the second-order factor model is the most optimal. Nevertheless, our results remain aligned with their conceptualization of six distinct but interrelated factors, reinforcing the validity of the six-factor structure at the core of their model and theoretical framework. Thus, Hypothesis 1 is accepted.

Accordingly, the correlated-factor model (M_3) is depicted in Fig. 1, illustrating the standardized factor loadings for items on their respective factors and all correlations between the factors.

Based on the superior fit of the correlated model, SECDs scores were calculated based on this model. Descriptive statistics for the SECDs's 25 items are presented in Table 3. Mean, standard deviation, skewness and kurtosis for each item are specified. SECDs item scores ranged from $M=3.41$ to $M=4.35$ with standard deviations around one. Item scores were negatively skewed (skewness of -0.82) suggesting that the majority of the answers fall in the high end of the scale. In addition to that, item scores were slightly peaked above the mean indicating positive kurtosis (mean of 0.64).

Table 2 Fit Statistics for the three-factor models

Model	χ^2	df	RMSEA	SRMR	CFI	TLI	Model comparison	$\Delta\chi^2$	Δdf
M_1	519	293	0.055	0.075	0.985	0.983	1 versus 3	160	39
M_{1a}	498	269	0.058	0.070	0.985	0.983			
M_2	1158	275	0.113	0.099	0.944	0.939			
M_3	359	254	0.040	0.061	0.993	0.992			

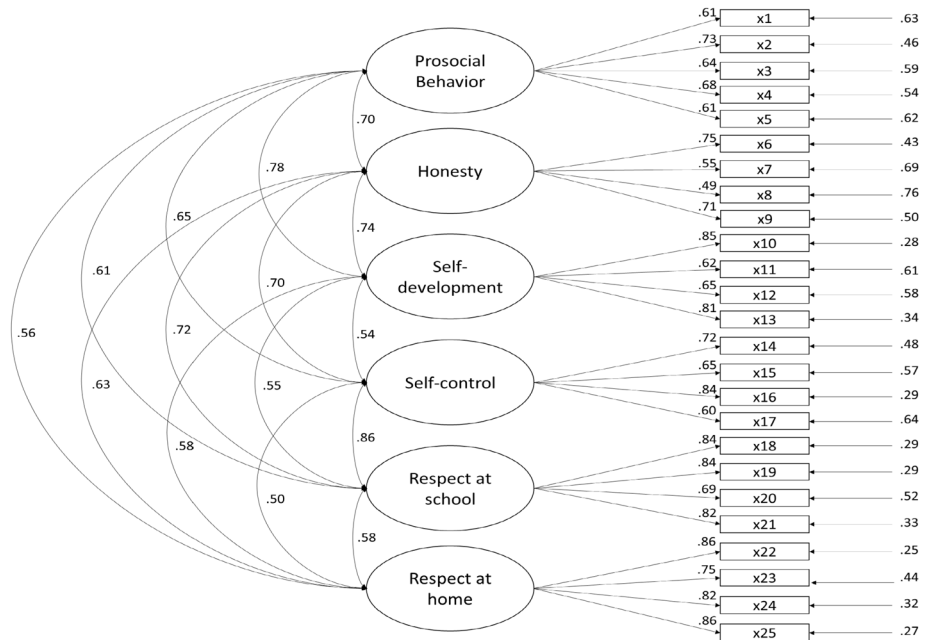


Fig. 1 Correlated-factor model for items on the SECDS

Hypothesis 2 *The SECDS will demonstrate high reliability, supported by strong internal consistency across all factors.*

Reliability indices for the six subscales were computed using Cronbach’s α and McDonalds ω (McDonald, 1970). As shown in Table 4, internal consistency coefficients were within acceptable ranges ($\alpha = > 0.70$ and $\omega = > 0.65$). However, the α coefficient for the “honesty” factor was below the minimally accepted threshold of 0.70. It is well documented across the literature that Cronbach’s α is sensitive to the number of items, being scales with low number of items associated with lower reliability scores (Cortina, 1993). Given the small number of items in the “honesty” subscale (i.e., four items); it is assumed that Cronbach’s α score is within an acceptable range. Therefore, both reliability indicators were acceptable for the SECDS subscales (prosocial behavior, honesty, self-development, self-control, respect at school and respect at home). Correlations between factors were also examined. Correlation coefficients ranged from 0.50 to 0.86 between the six SECDS factors. The highest correlation was between “self-control” and “respect at school” subscales while “self-control” and “respect at home” were moderately correlated. The correlations in this model lean toward moderate to high, with a stronger clustering around higher values (e.g., several correlations are above 0.70). See Fig. 1 for correlations among the factors.

The results provided support for Hypothesis 2. Cronbach’s α values exceeded 0.70 for most subscales, with the exception of the “honesty” subscale, which fell slightly below this threshold—a limitation attributed to its small number of items. McDonald’s ω values, however, surpassed the acceptable threshold of 0.65 across all subscales. Additionally, inter-factor correlations demonstrated meaningful and theoretically consistent relationships among the six SECDS factors. Therefore, Hypothesis 2 is accepted.

Table 3 Mean, standard deviation, skewness, and kurtosis of the SECDs

Items	M	SD	Skewness	Kurtosis
<i>Me relaciono bien con los demás</i> [I play nicely with others]	4.05	0.905	-0.846	0.629
<i>Hago cosas que son buenas para el grupo</i> [I do things that are good for the group]	4.01	0.775	-0.507	0.499
<i>Trato a mis amigos/as de la manera en la que me gusta que me traten</i> [I treat my friends the way I like to be treated]	4.24	0.878	-1.31	2.06
<i>Soy agradable con los chicos/as que son diferentes a mi</i> [I am nice to kids who are different from me]	4.32	0.749	-1.04	1.25
<i>Intento animar a otros chicos/as si se sienten tristes</i> [I try to cheer up other kids if they are feeling sad]	4.17	0.918	-1.26	1.93
<i>Me disculpo cuando he hecho algo mal</i> [I apologize when I have done something wrong]	4.08	0.966	-1.08	0.964
<i>Digo la verdad a los demás</i> [I tell the truth when I have done something wrong]	3.84	0.821	-0.0793	-0.817
<i>Cumplo las promesas que hago a los demás</i> [I tell others the truth]	4.09	0.792	-0.527	-0.274
<i>Admito mis errores</i> [I admit my mistakes]	3.80	0.976	-0.776	0.576
<i>Intento ser mejor persona</i> [I make myself a better person]	4.33	0.801	-1.39	2.59
<i>Sigo intentando algo hasta que lo consigo</i> [I keep try at something until I succeed]	4.02	0.916	-0.814	0.499
<i>Me fijo objetivos a mí mismo (hago planes para el futuro)</i> [I set goals for myself (make plans for the future)]	3.81	1.05	-0.652	-0.0693
<i>Intento ser mi mejor versión</i> [I try to be my best]	4.08	0.887	-0.991	1.25
<i>Espero mi turno tranquilamente en clase</i> [I wait my turn in line patiently]	3.87	1.09	-0.921	0.422
<i>Controlo mi genio cuando tengo una discusión con otros chicos/as</i> [I keep my temper when I have an argument with other kids]	3.41	1.11	-0.322	-0.516
<i>Sigo las normas incluso cuando nadie está mirando</i> [I follow the rules even when nobody is watching]	3.62	1.06	-0.691	0.107
<i>No hago caso a los demás chicos/as cuando se burlan de mí o me insultan</i> [I ignore other children when they tease me or call me a bad name]	3.43	1.33	-0.380	-1.02
<i>Hablo educadamente a mi profesor/a y a otros adultos en la escuela</i> [I speak politely to my teacher]	4.35	0.837	-1.64	3.51
<i>Obedezco a mi profesor/a y a otros adultos en la escuela</i> [I obey my teacher]	4.27	0.777	-1.11	1.73
<i>Escucho (sin interrumpir) a mi profesor/a y a otros adultos en la escuela</i> [I listen (without interrupting) to my teacher]	4.04	0.878	-0.728	0.391
<i>Sigo las normas de la escuela</i> [I follow the school rules]	4.11	0.850	-0.924	1.03
<i>Hablo educadamente a mi padres</i> [I speak politely to my parents]	4.25	0.762	-0.570	-0.719
<i>Obedezco a mi padres</i> [I obey my parents]	4.22	0.784	-0.512	-0.903
<i>Escucho (sin interrumpir) a mis padres</i> [I listen (without interrupting) to my parents]	4.10	0.877	-0.610	-0.376

Table 3 (continued)

Items	M	SD	Skewness	Kurtosis
<i>Sigo las normas en casa</i> [I follow the rules at home]	4.13	0.862	-1.00	1.46

Table 4 Reliability indices for the six SECDS subscales

Subscales	α	ω_1	ω_2	ω_3
Prosocial behavior	0.714	0.729	0.729	0.732
Honesty	0.666	0.687	0.687	0.685
Self-development	0.758	0.765	0.765	0.771
Self-control	0.765	0.753	0.753	0.743
Respect at school	0.813	0.823	0.823	0.837
Respect at home	0.837	0.845	0.845	0.852

Table 5 Mean scores and results from the t-test as a function of school level

SECDS	M		<i>t</i>	Cohen's <i>d</i>
	Primary	Secondary		
Prosocial behavior	4.19	4.05	1.751	0.240
Honesty	3.96	3.85	1.322	0.181
Self-development	4.11	3.96	1.571	0.216
Self-control	3.54	3.56	-0.221	-0.030
Respect at home	4.26	3.98	-0.881	-0.121
Respect at school	4.14	4.22	3.096*	0.425
Total score	4.04	3.94	1.386	0.19

* $p < 0.005$

Hypothesis 3 Significant differences in SECDS scores will be observed based on gender and educational level, reflecting variability in social-emotional skills across these groups.

Differences in the SECDS as a function of school level and gender were explored using independent t sample tests to compare mean scores across groups. Comparisons of mean scores did not indicate significant differences between students in primary and secondary school levels on the SECDS total score and most subscales. However, "respect at home" showed significant differences between students in primary and secondary levels, being primary school students the ones scoring higher ($M=4.26$ vs. $M=3.98$; $t=3.10$, $p < 0.005$, $d=0.426$). Concerning the effect size, these differences fell within the small range (Cohen, 1998). Table 5 displays SECDS mean scores for primary school students ($n=128$) and secondary school students ($n=90$) and the results from the independent t sample test.

Significant differences according to the gender of students were also found. Girls scored significantly higher in "prosocial behavior" ($M=4.27$ vs. $M=4.08$; $t=2.82$, $p < 0.005$, $d=0.35$) and "respect at school" ($M=4.32$ vs. $M=4.09$; $t=2.80$, $p < 0.005$, $d=0.34$). Concerning the effect size, these differences also fell within the small range (Cohen, 1988). "Honesty", "self-development", "self-control" and "respect at home" did not show any

Table 6 Mean scores and results from the *t*-test as a function of gender

SECDS	M		<i>t</i>	Cohen's <i>d</i>
	Female	Male		
Prosocial behavior	4.27	4.08	2.82*	0.35
Honesty	4.03	3.91	1.55	0.19
Self-development	4.16	3.99	2.04	0.25
Self-control	3.65	3.53	1.14	0.14
Respect at home	4.08	4.26	-2.19	-0.27
Respect at school	4.32	4.09	2.80*	0.34
Total score	4.10	3.98	1.84	0.22

* $p < 0.005$

significant differences according to gender. Table 6 displays SECDS mean scores for boys ($n = 138$) and girls ($n = 122$) and the results from the independent *t* sample test.

The results provide partial support for Hypothesis 3, indicating variability in social-emotional skills across certain groups but not uniformly across all dimensions. Significant differences were observed in specific SECDS subscales based on demographic factors. For educational level, primary school students scored higher on "respect at home". Regarding gender, girls scored higher on "prosocial behavior" and "respect at school." However, no significant differences were observed in the SECDS total score or other subscales for educational level or gender. These findings highlight some group-specific patterns but do not provide consistent evidence across all dimensions, offering only partial support for the hypothesis.

4 Discussion

Although the key role of social-emotional skills for students' successful participation in school and the wider community is highlighted, instruments measuring social-emotional skills and character traits are still scarce (Martinez-Yarza et al., 2023; Chernyshenko et al., 2018; Pancorbo et al., 2020). In fact, there is a lack of self-reported measures with adequate psychometric properties for primary and secondary school students that has been developed or adapted in the Spanish territory. The present study provided support for a translation and adaptation of the SECDS in a primary and secondary student sample. The multidimensional and hierarchical structure of the SECDS was confirmed in line with prior findings (Ji et al., 2013, 2021). SECDS individual scales demonstrated reliability evidence for elementary and secondary school-aged students.

While the study emphasizes the significance of adapting the SECDS for Spanish-speaking students, its contribution extends well beyond the Spanish context. The validation process undertaken in this study ensures the SECDS can serve as a benchmark for cross-cultural adaptations in other linguistic and cultural settings. For international researchers and practitioners, this study offers a validated instrument to assess and develop social-emotional skills in diverse educational contexts. It facilitates the potential for international comparative studies by providing a reliable tool for measuring constructs consistently

across populations. Ultimately, this research supports localized adaptations and contributes to a shared, evidence-based understanding of social-emotional development worldwide.

4.1 Confirmatory factor analysis: validation of the SECDS structure

Concerning the measure's factor structure, the single-factor model indicated non-positive definite fit suggesting that a unidimensional conceptualization of the SECDS may lead to an oversimplification of the construct of social-emotional competencies. The results of the present study are thus consistent with prior investigations and confirm the multidimensionality of the measure (Ji et al., 2013, 2021). In addition to that, analyses confirmed both the hypothesized second-order factor model and the alternative correlated-factor model. The hierarchical structure of the SECDS was thus confirmed demonstrating acceptable fit of the hypothesized second-order factor model. However, the alternative correlated-factor model provided a better explanation of the structure of the social-emotional competencies and character traits in the present sample. These findings contrast slightly with those of Ji et al. (2013, 2021), who found the second-order factor model to be optimal. Notably, in their 2021 study with middle school students, the improvement in fit for the second-order factor model was minimal despite a significant difference test.

With this in mind, the most suitable measurement model for the SECDS in the Spanish sample is the correlated-factor model consisting of six factors (prosocial behavior, honesty, self-control, self-development, respect at school and respect at home) and where all potential correlations between the factors are established. In fact, it is suggested that social-emotional skills and character traits are the result of an interaction between these six independent factors. This alternative model is structured correlating individual SECDS scales rather than unifying them under a higher-order factor as in the original second-order factor model supported by Ji et al. (2013, 2021). Although our results suggest the potential value of the second-order factor model of SECDS in the educational context, the correlated model obtained better-fit indices. Our results build on Ji and colleagues' framework, validating the SECDS in a potentially different context, which accounts for the variance in optimal model structure.

4.2 Internal consistency and improvements in scale design

In terms of reliability, all components present adequate internal consistency coefficients with high estimated values for both Cronbach's α and McDonald's ω , similar to those reported in previous studies (Ji et al., 2013, 2021). The reliability analysis showed that the estimates of internal consistency for the SECDS individual scales were generally acceptable. As previously mentioned, the relatively low estimates of reliability for the "honesty" subscale may be related with the low number of items associated with lower reliability scores (Cortina, 1993). Given the small number of items in the "honesty" subscale (i.e., four items), it is assumed that Cronbach's α score is within an acceptable range. Ji et al. (2013) similarly observed that certain subscales occasionally exhibited lower reliability, particularly among younger students in earlier grades. While internal consistency estimates were generally acceptable, they found lower reliability was observed at Grade 3, likely due to the instrument's reading level exceeding the comprehension abilities of some students in this age group. Consistent with their research, the developmental factor may also contribute to the variability in reliability estimates observed in our study.

For the questionnaire to function the most optimally, we recommend eliminating three items that would leave the Spanish-language version of the SECDS with three items less than the original. Two items were removed during translation and adaptation to optimize response time, and a third was deleted during CFA due to low factor loadings affecting the model. Despite these adjustments, the factors would still effectively capture the core essence of the dimensions. We also recommend employing a 5-point Likert scale (0=strongly disagree, 1=disagree, 2=neutral, 3=agree, 5=strongly agree) instead of the original four-point scale with simplified response anchors (0=NO!, 1=no, 2=yes, 3=YES!) to capture the developmental level of secondary-aged students. This modification addresses limitations observed in previous studies. Ji et al. (2021) revised their response scale after finding very low frequencies in the first category, which led to uneven data distribution and model instability. They resolved this issue by merging the first two response categories, yielding acceptable fit indices for the second-order factor model. Building on this approach, we implemented a 5-point Likert scale with developmentally appropriate anchors to capture of greater nuance in students' social-emotional skills. This advancement reflects a scalable methodological improvement and provides a framework for similar adaptations in other countries.

4.3 Group variability in social-emotional skill scores

Regarding differences in social-emotional and character traits as a function of school level, no considerable differences were found between primary and secondary school-aged students. Merrell et al. (2011) acknowledged no significant differences in social-emotional strengths, assets, resilience, and adaptive approaches between students in primary and secondary grades. This finding is also consistent with the results presented by Coryn et al. (2009) where the mean social-emotional skills scores did not significantly differ by grade across the three subscales: task articulation, peer relationships, and self-regulation. In addition to that, students' social-emotional and character development did not result in notable differences as a function of gender. However, girls had higher scores in "prosocial behavior" and "respect at school". Although these differences fell within the small range, it is worth highlighting the gender differences showed in some of the subscales given the ample empirical evidence on the matter. In line with the findings by Zych et al. (2018), girls scored higher in social-awareness and prosocial behavior, responsible decision-making, as well as in overall social-emotional development. The present study evidenced small differences in some social-emotional variables as a function of school level and gender, but it is beyond the scope of this paper to perform an in depth analysis of the variability across groups and future research should aid to clarify these differences.

In summary, the analysis of the validity and reliability of the SECDS allows us to conclude that: (i) the most suitable factor structure for the SECDS in the Spanish territory is the correlated-factor model, (ii) the final version of the questionnaire resulting from the Spanish adaptation is shorter (25 items) than the original version (28 items), (iii) each of the 25 items considered individually presents adequate metric properties; and (iv) the original four-point scale with simplified response anchors can be converted into a 5-point Likert scale. Despite having fewer items and modifying the original four-point scale with simplified response anchors, the theoretical coherence of the base model is not affected and remains in line with the findings of the study of the SECDS by Ji et al. (2013, 2021) in which a six-component solution is suggested. See Appendix for the final Spanish version of the SECDS.

4.4 Limitations and future research

Finally, the present findings should be considered in light of the following methodological limitations. First, the sample size was not very large which led us to carry out the CFA on the total sample. In addition to that, the dataset was composed of socioeconomically and ethnically diverse, low-income students. To address these limitations, future research should aim to increase the sample size and incorporate a broader range of socioeconomic and ethnic profiles. This would not only enhance the generalizability of the findings but also allow for cross-cultural comparisons, which are critical for understanding the universality of the SECDS across different populations. Additionally, longitudinal studies are highly recommended to explore the stability and developmental trajectory of social-emotional skills over time. Such research could provide valuable insights into how these skills evolve, offering a deeper understanding of their long-term implications and developmental dynamics.

Second, measurement invariance of the SECDS was not analyzed as it was beyond the scope of the present paper. Accordingly, given the importance of further research on social-emotional skills and character traits, it would be interesting to measure factorial invariance of the SECDS for grade, race/ethnicity, and gender on a new sample of school-aged students in a future paper. Ensuring factorial invariance would confirm whether the instrument measures the same constructs consistently across different groups. Future research should also explore the external validity of the SECDS by linking its scales to relevant external criteria, such as teacher evaluations, peer assessments, or real-life outcomes like classroom behavior or community involvement. These efforts would strengthen the evidence base for the SECDS, supporting its broader applicability in diverse educational and cultural contexts.

5 Conclusions

The results of the present study indicate that the Spanish translation and adaptation of the SECDS is a good measure for measuring social-emotional skills and character traits. This version of the SECDS is a useful and psychometrically reliable measure for assessing the different dimensions of students' social-emotional skills and character traits in primary and secondary school levels. It allows for potential administration of a short assessment tool in schools and other educational settings to identify students' strengths and needs. It responds to a current need in educational research for high quality assessment of social-emotional skills that are critical for students' success in school and in life.

Furthermore, the results provide evidence for the multidimensionality of the construct of social-emotional skills and thus confirm prior investigations on the conceptualization of social-emotional skills as a multifaceted construct. The Spanish version of the SECDS also serves to advance research on strength-based assessment as it emphasizes the measurement of students' positive psychological traits. The relevance of assessing students' strengths and other positive characteristics is highlighted given the influence that traditional disorder driven approaches continue to have in regular school assessment practices. This version of the SECDS has been validated with a student sample of participants of CaixaProinfancia program whose families meet the national threshold for poverty risk. The present results can therefore inform research of the potential

disadvantages faced by students from low-income households in terms of social-emotional skills and personality traits.

Appendix

Social-emotional and character development scale (SECDs)

SECDs subscale	Item
Prosocial behavior	Me relaciono bien con los demás
	Hago cosas que son buenas para el grupo
	Trato a mis amigos/as de la manera en la que me gusta que me traten
	Soy agradable con los chicos/as que son diferentes a mí
	Intento animar a otros chicos/as si se sienten tristes
Honesty	Me disculpo cuando he hecho algo mal
	Digo la verdad a los demás
	Cumplo las promesas que hago a los demás
Self-development	Admito mis errores
	Intento ser mejor persona
	Sigo intentando algo hasta que lo consigo
	Me fijo objetivos a mí mismo (hago planes para el futuro)
Self-control	Intento ser mi mejor versión
	Espero mi turno tranquilamente en clase
	Controlo mi genio cuando tengo una discusión con otros chicos/as
	Sigo las normas incluso cuando nadie está mirando
Respect at school	No hago caso a los demás chicos/as cuando se burlan de mí o me insultan
	Hablo educadamente a mi profesor/a y a otros adultos en la escuela
	Obedezco a mi profesor/a y a otros adultos en la escuela
	Escucho (sin interrumpir) a mi profesor/a y a otros adultos en la escuela
Respect at home	Sigo las normas de la escuela
	Hablo educadamente a mi padres
	Obedezco a mi padres
	Escucho (sin interrumpir) a mis padres
	Sigo las normas en casa

Funding This project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under the Marie Skłodowska-Curie grant agreement N° 847624. In addition, a number of institutions back and co-finance this project.

Declarations

Conflict of interests The authors have no conflict of interest to disclose.

Ethical approval This research was conducted with the review and approval of the University of Deusto Research Ethics Committee, institution at which the authors are affiliated.

Human and animal participants Appropriate research approvals were also obtained from the families of students participating in the survey and from the officials representing the CaixaProinfancia programme in the Basque Autonomous Community.

Informed consent Participants in this study gave their informed consent in written prior to study inclusion.

Consent for publication This publication reflects only the authors' view and the Research Executive Agency is not responsible for any use that be made of the information it contains.

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