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TITLE PAGE

Title: Validation of the Spanish version of the Student–Teacher Relationship Scale Short Form (STRS-SF) to Assess Teacher-Student Relationship Quality

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DECLARATIONS

Ethics approval and consent to participate:

The study was approved by the Institutional Ethics Committee of Comillas University (protocol number 2021/71) and was conducted in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments.

Consent for publication:

Not applicable.

Availability of data and materials:

The datasets generated and analyzed during the current study are available from the corresponding author on reasonable request.

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A.H., C.P., and A.B. contributed to the conceptualization and methodology of the study. A.H. conducted the formal analysis and investigation. A.H., C.P., and A.B. wrote the original draft and contributed to reviewing and editing the manuscript. A.H. coordinated the research process. All authors read and approved the final manuscript.

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ABSTRACT

Background: The quality of teacher-student relationships is a key factor in students' academic performance, psychological well-being, and social development. From an attachment theory perspective, teachers can function as a secure base and safe haven, supporting both the emotional security and exploratory behaviors of students. One of the most widely used instruments for assessing these relationships is the Student-Teacher Relationship Scale Short-Form, which evaluates two dimensions: Closeness and Conflict. Although the long version of this scale has been validated in Spain, no adaptation or validation of the short form existed for Spanish-speaking populations. **Methods:** The present study aimed to adapt and validate the Student-Teacher Relationship Scale Short-Form in a Spanish context. A total of 60 teachers from various regions of Spain completed 240 assessments of their students, including measures of the Student-Teacher Relationship, Student Attributes and Behaviors, and the degree of difficulty in working with each student. Confirmatory factor analysis (CFA) was conducted to examine the internal structure of the scale, and associations with external criteria were analyzed. **Results:** The CFA supported a two-factor structure consistent with the original version of the scale. One item showed weak psychometric performance, and a revised 14-item model demonstrated improved fit and coherence. The adapted version showed high internal consistency (Closeness, $\alpha = .892$; Conflict, $\alpha = .894$) and significant associations with teacher perceptions of student behavior and relationship difficulty. **Conclusions:** These findings provide preliminary evidence of validity based on internal structure and relations to external criteria for the Spanish version of the STRS-SF and highlight its potential as an efficient tool for assessing the quality of teacher-student relationships. This adaptation may provide educators and researchers with a culturally appropriate instrument to identify relational difficulties in the classroom and to inform intervention strategies aimed at promoting positive interactions and student well-being in Spanish-speaking educational settings.

KEYWORDS

Teacher-student relationship; Attachment-based Education; Psychometric validation; Student-Teacher Relationship Scale Short-Form; School adjustment; Student well-being

BACKGROUND

Over the past few decades, research has demonstrated that the quality of student-teacher relationships (STR) is closely linked to various academic, psychological, social, and educational outcomes across

different grades and contexts (Fabris et al., 2022). STRs have been consistently associated with a broad spectrum of academic, psychological, and social outcomes. Recent meta-analytic evidence confirms their contribution to academic performance, socioemotional adjustment, and behavioral regulation across developmental stages (Emslander et al., 2025). STRs are also linked to students' engagement, motivation, and academic self-efficacy—key processes that mediate school adjustment and learning outcomes (Tao & Meng, 2022). Furthermore, recent work has underscored the foundational role of STRs in the educational experience itself, emphasizing their relevance for fostering emotionally safe, empowering, and meaningful classroom environments (Author). STRs can also function as protective factors in child development, reducing vulnerability among at-risk students, promoting inclusion within peer groups, encouraging prosocial behavior, and shaping students' academic and career trajectories (Author, Emslander et al., 2025; Longobardi et al., 2021).

These findings highlight the importance of the relational and affective dimensions of education and draw attention to a hypothesis put forth by Pianta (1999) who suggested that STR functions in a way that is analogous to attachment relationships. Responsive attachment figures provide experiences of "safe haven" in the face of the child's attachment needs (e.g., pain, fear or need of comfort) and "secure base" experiences in the face of the child's exploration needs (e.g., novelty-seeking, individuation, self-affirmation) (Bowlby, 1988). The hypothesis of teachers as attachment-like figures would entail that teachers can serve as alternative caregivers during school hours, particularly in early childhood, an argument that extends the parent-child relationship framework to the classroom setting (Davis, 2013; Kennedy & Kennedy, 2004; García-Rodríguez et al, 2023; Verschueren & Koomen, 2012). This conceptualization has been supported by studies examining attachment-related constructs in educational contexts, including the role of dependency and relational dynamics in teacher–child interactions (Gregoriadis et al., 2021). Teachers who foster a sense of closeness while being attuned to their students' emotional needs can act as a "secure base", facilitating secure exploration. This exploration may take various forms, such as learning within the zone of proximal development, interacting with peers, collaborating in uncertain situations, or seeking help when necessary (Mashburn & Pianta, 2006). These and other considerations have made STR a key area of research within school settings. STR has become essential for understanding how and why children learn, cope, and adjust well to school environments. It is also the focus of numerous intervention and prevention efforts (Kincade et al., 2020; Duong et al., 2019).

One of the most widely used tools for assessing teachers' perceptions of their relationships with students is the Student-Teacher Relationship Scale (STRS), including its short form (STRS-SF; Pianta, 2001), which is the focus of this paper. This instrument offers both researchers and professionals an efficient way to assess teacher-student relationships, identify students at risk and explore the relationship between these STR dimensions and other aspects of children's, teachers', and families' educational experiences. Furthermore, it provides guidance for intervention/prevention programs and serves as a tool for monitoring progress over time.

The STRS-SF is a self-report questionnaire that measures teachers' perceptions of two main dimensions of their relationship with students: *conflict* and *closeness*. Conflict refers to the degree to which the teacher perceives discord and a lack of rapport with the student. High levels of conflict are associated with social withdrawal, antisocial behaviors, school maladjustment, and deficits in math and language skills (Birch & Ladd, 1998; Buyse et al., 2009; Hamre & Pianta, 2001; Murray et al., 2008; Palermo et al., 2007; Rudasill & Rimm-Kaufman, 2009). Closeness refers to the teacher's perception of warmth and openness in the relationship with the student. This has been positively associated with school adjustment (Arbeau et al., 2010; Baker, 2006; Buyse et al., 2009; Pianta et al., 1995), prosocial behavior (Longobardi et al., 2021; Palermo et al., 2007), task performance effectiveness (Ahnert et al., 2013), academic performance (Birch & Ladd, 1997; Peisner-Feinberg et al., 2001; Spilt et al., 2012), and stress regulation (Ahnert et al., 2012). These two dimensions of STR are correlated and may even influence each other. For example, Hajovsky et al. (2020) found that an increase in conflict from second to sixth grade coincided with a sharp decline in closeness. The original full version of this scale includes a third dimension, Dependence, which refers to the level of dependency the teacher perceives in the student. High scores on this dimension are associated with constant requests for attention or help and exaggerated reactions to separation. However, this dimension has been removed from the short form due to concerns about its reliability and validity (Koomen et al., 2012; Roorda et al., 2021). Gregoriadis and Tsigilis (2008) were among the first to highlight these psychometric limitations when examining the applicability of the STRS in the Greek educational context.

The STRS-SF offers significant advantages over the original STRS, particularly in research and applied settings where time efficiency is critical. By reducing from 28 to 15 the number of items, the STRS-SF maintains robust psychometric properties while minimizing respondent burden, thereby increasing completion rates and ensuring higher data quality. Additionally, its concise format enhances its

usability in large-scale studies and routine assessments, making it a practical tool for evaluating teacher-student relationships without compromising the depth of analysis provided by the original scale. The scale's psychometric soundness has also been supported in cross-cultural validations, such as in the Greek kindergarten context, where validity evidence based on internal structure and relations to external criteria were confirmed (Tsigilis & Gregoriadis, 2008). Additionally, the original version of the STRS has shown good reliability and validity evidence across multiple sources in other cultural contexts, such as Italy (Settanni & Longobardi, 2015), further supporting the scale's international applicability.

The objective of this study is to present psychometric evidence for the validation of the Spanish version of the STRS-SF, building on previous evidence regarding its underlying factorial structure. Although the long version of the scale has already been validated in Spanish (Moreno & Martínez-Arias, 2008), the STRS Short Form constitutes a psychometrically and functionally distinct instrument. The STRS-SF is not merely an item-reduced version of the long form, but a tool with a different item composition and a reduced factorial structure. Moreover, it has been increasingly adopted in international research and applied contexts where time efficiency and reduced respondent burden are essential. For these reasons, a direct adaptation and validation of the STRS-SF was considered necessary, rather than deriving it from the Spanish version of the long form.

To achieve this, we pursued the following research steps:

1. The original scale items were translated into Spanish using a forward-backward procedure to ensure linguistic equivalence. Reliability indices and validity evidence based on internal structure were examined through confirmatory factor analysis (CFA), based on the factorial structure proposed in previous research. Validity evidence based on relations to external criteria was explored using instruments that assess constructs theoretically related to STRS-SF.

To examine validity evidence based on relations to external criteria, we replicated the strategy followed by Moreno and Martínez-Arias (2008), which involved examining how teachers' perceptions of the relationship relate to their perceptions of student characteristics. Specifically, we analyzed three domains of teacher-rated student attributes: (1) *cognitive attributes* (e.g., attention, effort, academic performance), (2) *non-cognitive personal traits* (e.g., introversion, obedience, independence), and (3) *peer-related behaviors* (e.g., helping others, aggression, participation in group activities). Each of these domains reflects key dimensions of students' classroom functioning. Since the STRS-SF captures relational dynamics as perceived by the teacher, these attributes are also subject to that same subjective

lens. It is therefore expected that higher levels of Closeness will correspond to more positive evaluations of students' attributes, while higher levels of Conflict will correlate with more negative perceptions.

METHODS

Participants

The study included a total of 60 participating teachers, of whom 81.7% were women, 16.7% were men, and 1.7% were non-binary. Their average age was 47 years (SD=8.644, range 24-63), and they had an average of 19.29 years of professional experience (SD=8.521, range 1-35). All participants were practicing in Spain, with 93.3% from the Autonomous Community of Madrid and the remaining 6.7% from other regions such as Galicia, the Valencian Community, and Gipuzkoa. Of the teachers, 75% worked in charter schools, 20% in public schools, and 5% in private schools. Furthermore, 80% were classroom tutors, 15% were subject-specific teachers, 3.3% were specialized support professionals (Speech and Language or Therapeutic Pedagogy specialists), and 1.7% had other roles.

The teachers had an average of 25.92 students under their care (SD=11.356, range 0-90), with the majority (65%) working primarily alone in the classroom. Only 11.7% worked with the support of another professional for most of the day, while the remaining 23.3% received support from other professionals at specific times during the day.

Teachers completed a total of 240 questionnaires, with each teacher completing four questionnaires. In particular, each participating teacher was required to select the first four students from their class group and complete the evaluation protocols for each of them.

The student sample was composed of 49.8% girls and 50.2% boys, with an average age of 9.09 years (SD = 4.215), spanning a diverse age range from 3 to 18 years.

Instruments

Student-Teacher Relationship Scale Short-Form (STRS-SF, Pianta, 2001).

The STRS-SF is a self-report instrument designed to assess professional caregivers' perceptions of the quality of their relationship with a specific child. This scale consists of 15 items that measure two factors: closeness and conflict. Closeness is assessed with eight items (e.g., "This child spontaneously shares information about himself/herself"), and conflict is assessed with seven items (e.g., "This child easily becomes angry at me"). Each item is rated on a five-point Likert scale, with response options ranging from 1 (Definitely does not apply) to 5 (Definitely does apply). Higher scores on the closeness factor

indicate more positive interactions, whereas higher scores on the conflict factor reflect more negative interactions.

The adaptation of the STRS-SF followed a structured translation and cultural adaptation process aimed at ensuring conceptual equivalence rather than literal correspondence. First, a bilingual researcher with expertise in educational psychology translated the original English items into Spanish. Second, an independent bilingual psychologist, familiar with both the source and target cultural contexts, conducted a back-translation into English. Discrepancies were discussed within the research team, focusing on semantic clarity, conceptual fidelity, and contextual appropriateness for the Spanish educational system. Item wording decisions were primarily guided by expert judgment within the research team, composed of researchers with expertise in educational psychology, regarding meaning and contextual relevance within contemporary Spanish school settings. Although a formal multi-step cultural adaptation protocol (e.g., TRAPD) was not implemented, the procedure followed current recommendations emphasizing conceptual equivalence and expert review over literal translation.

Evaluation of Student Attributes and Behaviors (Moreno & Martínez-Arias, 2008).

This set of questions evaluates different student characteristics grouped into three attribute categories: non-cognitive (e.g., "is dominant," "is independent"), cognitive (e.g., "shows interest in learning," "achieves good academic results"), and interpersonal (e.g., "easily gets into fights," "helps others"). Each attribute is rated on a five-point Likert scale, with response options ranging from 1 (does not correspond to the child's behavior) to 5 (describes the child very well).

Other measures

Additionally, teachers were asked about their own and their students' sociodemographic characteristics and the teacher’s perception of the degree of difficulty in working with each student, rated on a Likert scale from 1 (Very easy) to 10 (Very difficult).

Procedure

The sample recruitment was conducted digitally through an online data collection platform. The questionnaire was distributed among the network of contacts and social media channels of the (hidden name of the institution), as well as through the network of contacts within the Department of Education at the Faculty of Human and Social Sciences of the same university. Participants were informed about the research objectives and the data protection laws governing the study, and their informed consent was

obtained before starting the questionnaire. All collected data were anonymous, and approval from the Institutional Ethics Committee was obtained.

Analysis plan

For the study of validity evidence based on internal structure, a Confirmatory Factor Analysis (CFA) was conducted with the entire sample (n = 240), based on the factorial structure proposed in previous research. The items were measured using a five-point Likert-type response format. In line with common practice in applied psychometric research, estimation methods appropriate for each analysis were used (Brown, 2015). CFA was estimated using maximum likelihood (ML), implemented in JASP. In the CFA, several fit indices were used to assess the quality of the models: the chi-square statistic (χ^2), the root mean square error of approximation (RMSEA) and its 90% confidence interval, and the Tucker–Lewis index (TLI; Tucker & Lewis, 1973) and comparative fit index (CFI; Hu & Bentler, 1999). Acceptable model fit was defined as RMSEA < .08, CFI > .95, and TLI > .95 (Abad et al., 2011; Brown, 2015). Internal consistency of the scale and subscales was calculated through Omega and Alpha coefficients. For the study of validity evidence based on relations to external criteria, Pearson correlations were calculated. Analyses were conducted in SPSS 28.0 and JASP 18.3.

RESULTS

Descriptive Analysis of the Adapted STRS-SF

All items exhibited adequate variance, with standard deviation values ranging from 0.93 to 1.37, and all items spanning a range from 1 to 5 (see Table 1). Additionally, the Kolmogorov-Smirnov test results indicated that the normality assumptions for any of the items were not met.

Table 1.

Descriptive Statistics and Normality Analysis of the Items

							Kolmogorov-Smirnov	
	Mean	SD	Min	Max	Skewness	Kurtosis	Statistic	p
STRS1	4.275	1.035	1	5	-1.417	1.192	.333	<.001
STRS2	1.542	0.936	1	5	1.743	2.292	.406	<.001
STRS3	3.712	1.296	1	5	-.592	-.898	.227	<.001
STRS4	1.808	1.216	1	5	1.233	.220	.384	<.001
STRS5	4.213	1.035	1	5	-1.189	.618	.322	<.001
STRS6	4.375	0.973	1	5	-1.664	2.234	.361	<.001
STRS7	3.667	1.353	1	5	-.664	-.842	.226	<.001
STRS8	1.604	1.030	1	5	1.711	1.970	.392	<.001

STRS9	3.717	1.317	1	5	-.672	-.781	.223	<.001
STRS10	2.204	1.371	1	5	.767	-.777	.269	<.001
STRS11	1.879	1.290	1	5	1.219	.116	.361	<.001
STRS12	1.800	1.242	1	5	1.312	.337	.382	<.001
STRS13	1.729	1.156	1	5	1.413	.824	.390	<.001
STRS14	1.629	1.047	1	5	1.495	.924	.401	<.001
STRS15	3.567	1.367	1	5	-.458	-1.106	.215	<.001

Validity evidence based on internal structure

Confirmatory Factor Analysis

A Confirmatory Factor Analysis (CFA) was conducted to examine the fit of the two-factor structure of the STRS-SF proposed in previous research. The initial model including all 15 items showed an acceptable fit to the data, $\chi^2(82) = 149.650$, $p < .001$; RMSEA = .059, 90% CI [.043–.073], p = .165; CFI = .963; TLI = .952; SRMR = .074. However, inspection of the parameter estimates revealed that Item 4 showed a very low standardized factor loading ($\lambda = .19$) and a high residual variance, indicating poor representation of the latent construct. In addition, modification indices suggested potential cross-loadings and localized areas of strain associated with this item. Based on these results, a revised model excluding Item 4 was estimated. This model showed an improved fit to the data, $\chi^2(27) = 132.553$, $p < .001$; RMSEA = .056, 90% CI [.040–.071]; CFI = .977; TLI = .973. As shown in Table 2, the revised 14-item model demonstrated a slight improvement in model fit compared to the original 15-item model.

Table 2.

Fit indices for the tested CFA models

Model	χ^2	df	RMSEA	90% CI RMSEA	CFI	TLI	SRMR
15-item model	149.650	82	.059	[.043, .073]	.963	.952	.074
14-item model	132.553	27	.058	[.042, .075]	.977	.973	.072

Note. RMSEA = root mean square error of approximation; CFI = comparative fit index; TLI = Tucker–Lewis index; SRMR = standardized root mean square residual.

In the final model, all items exhibited high and statistically significant factor loadings ($\lambda > .67$, $p < .001$), supporting the expected two-factor structure of Closeness and Conflict (see Table 3).

Table 3.

Standardized factor loadings from the Confirmatory Factor Analysis (CFA)

Factor	Item	Standardized factor loading	Standard Error	z-value	p-value
Closeness	STRS1	.678	0.042	17.414	< .001

	STRS3	.777	0.050	19.313	< .001
	STRS5	.859	0.044	19.756	< .001
	STRS6	.725	0.042	16.166	< .001
	STRS7	.696	0.052	17.089	< .001
	STRS9	.672	0.053	19.763	< .001
	STRS15	.781	0.052	19.852	< .001
Conflict	STRS2	.670	0.041	16.615	< .001
	STRS8	.691	0.042	17.125	< .001
	STRS10	.726	0.054	17.406	< .001
	STRS11	.810	0.058	18.649	< .001
	STRS12	.841	0.057	17.243	< .001
	STRS13	.753	0.049	17.610	< .001
	STRS14	.678	0.043	16.567	< .001

Reliability

The internal consistency of both dimensions was high in the final 14-item model. Closeness showed ω = .887 and α = .892, while Conflict showed ω = .892 and α = .894. The correlation between the factors was low but statistically significant ($r = -.21$, $p < .001$). Overall reliability for the scale was also satisfactory (ω = .867, α = .755).

Validity evidence based on relations to external criteria

To examine validity evidence based on relations to external criteria, teachers were asked how difficult they found it to work with each of the evaluated students. Pearson correlation analyses revealed a low negative association with the Closeness factor ($r = -.180$, $p < .001$) and a moderate positive association with the Conflict factor ($r = .461$, $p < .001$). Pearson correlation coefficients were calculated between the scores of the Closeness and Conflict factors and the attributes of the students evaluated by the teachers. The results, presented in Table 4, show significant relationships between the two factors and variables from the three groups of attributes.

The Closeness dimension displayed positive and significant relationships with non-cognitive attributes such as *being entrepreneurial*, *independent*, and *obedient*, and a negative association with being *introverted*. All cognitive attributes were positively and moderately associated with this factor. Additionally, within the peer domain, Closeness was positively associated with the ability to *participate joyfully in group activities* and to *help others*, and negatively associated with the *tendency to engage in fights easily*.

Conversely, the Conflict dimension was positively associated with the non-cognitive attribute of being dominant and negatively associated with being *independent*, *conformist*, *calm*, and *obedient*. Most

cognitive attributes were negatively associated with this factor, with the exception of *having a good memory*, which did not show a significant relationship. Finally, Conflict was significantly associated with all peer-related variables. Higher levels of *conflict* were associated with greater likelihood of *hitting or being aggressive toward others*, *being bullied by peers*, *easily engaging in fights*, and *annoying or insulting others*. In contrast, Conflict was negatively associated with the *student's ability to participate joyfully in group activities* and to *help others*.

Table 4.

Correlations between the Closeness and Conflict factors and the Attributes.

	Closeness	Conflict
Non-cognitive attributes		
Introverted	-.274**	-.080
Dominant	-.007	.543**
Entrepreneurial	.280**	-.068
Independent	.271**	-.209**
Conformist	-.012	-.365**
Calm	.082	-.563**
Obedient	.233**	-.681**
Cognitive attributes		
Pays attention	.305**	-.543**
Makes efforts	.374**	-.476**
Shows interest in learning	.477**	-.491**
Has a good memory	.260**	-.122
Achieves good academic results	.309**	-.283**
Peer-related behaviors		
Hits or aggresses others	-.120	.541**
Is bullied by others	-.049	.265**
Engages in fights easily	-.157*	.562**
Joyfully participates in group activities	.493**	-.279**
Helps others	.439**	-.395**
Bothers or insults others	-.105	.551**

*Note: *p<.05; **p<.001*

DISCUSSION

Building on previous research highlighting the importance of student-teacher relationship (STR) in educational processes (Emslander et al., 2025; Author; Roorda et al., 2011), and in response to the need of efficient, accessible and scientifically-informed instruments to monitor the STR in the Spanish domain,

this study examined the psychometric functioning of the Spanish version of the STRS-SF, with particular attention to its internal structure, internal consistency, and associations with theoretically related external criteria.

The main finding was that the Spanish adaptation showed a two-factor structure consistent with the original short form, distinguishing Closeness and Conflict. As secondary findings, both subscales showed satisfactory internal consistency, and their scores were associated with teacher-rated student characteristics and perceived relational difficulty in theoretically expected directions. Taken together, these results provide preliminary support for the use of the Spanish STRS-SF in this sample, while also identifying aspects of the scale that require further study.

With regard to the primary objective, the results generally supported the expected bidimensional structure of the STRS-SF. The CFA showed good fit indices, and most items loaded strongly on their intended factors. This pattern is broadly consistent with prior work on the short form and suggests that the distinction between Closeness and Conflict is also meaningful in this Spanish sample. However, this conclusion should be qualified by the fact that one item (item 4) did not perform adequately, indicating that support for the internal structure is not uniform across the full set of items.

In the present study, a revised 14-item model was retained for subsequent analyses, given the consistently weaker performance of Item 4 compared to the remaining items. Although the item was translated with conceptual fidelity and did not raise linguistic concerns during the adaptation process, its psychometric performance in the Spanish sample was suboptimal. From a substantive perspective, references to physical affection or touch may activate culturally specific meanings in the current Spanish educational context (e.g., Moreno & Martínez-Arias, 2008). Increased institutional and societal attention to child protection, professional boundaries, and “safe environment” policies in schools (González et al., 2025) may lead teachers to interpret this item in terms of professionally discouraged behavior rather than relational comfort. This interpretation difficulty is not unique to the Spanish context: similar concerns regarding the cultural sensitivity of items related to physical affection were raised by Tsigilis and Gregoriadis (2008) in their validation of the STRS-SF in Greece. In the present study, Item 4 was characterized by a combination of weak factor loading, high residual variance, and limited variability, consistent with a potential floor effect, suggesting reduced sensitivity within the Conflict dimension. In addition, the item showed a near-zero item–total correlation ($r = .008$), indicating minimal contribution to

the overall construct measured by the scale. Its association with the Conflict dimension was also low (r = .19), further indicating that the item did not adequately represent this dimension.

Importantly, these findings do not necessarily imply that the item should be definitively excluded from the Spanish version of the scale. Rather, they point to the need for further investigation. Future research should examine whether Item 4 may benefit from reformulation and re-evaluation in independent samples, potentially incorporating qualitative input from teachers to ensure conceptual clarity and contextual relevance.

The secondary results on internal consistency were also broadly favorable. The Closeness and Conflict subscales showed reliability estimates in line with prior studies, suggesting that both dimensions can be measured with reasonable consistency in this sample. In all cases, the values were very close to those reported in the validation sample of the short form (Pianta, 2001) and in the Spanish adaptation of the original form (Moreno & Martínez-Arias, 2008). The significant correlation between both scales suggests the possibility of a global measure of STR; however, its low magnitude urges caution in this interpretation.

Reliability estimates from a single study, particularly with a modest and geographically concentrated sample, do not by themselves establish the broader psychometric robustness of the instrument. Thus, the present findings should be considered preliminary.

Evidence based on relations with external criteria followed the expected pattern and provides an additional, although still limited, source of support for the scale. Closeness was associated with more adaptive teacher-rated student characteristics, including better cognitive engagement, more prosocial behavior, and lower introversion. Conflict, in contrast, was associated with more relational and behavioral difficulties, including aggression, peer problems, and lower perceived competence and self-regulation. In addition, teachers' perceived difficulty in working with a student was negatively related to Closeness and more strongly and positively related to Conflict. These findings align with established research. For example, Closeness was positively associated with prosocial behaviors and cognitive engagement (Birch & Ladd, 1997; Ahnert et al., 2013), while Conflict correlated with behavioral issues and social withdrawal (Hamre & Pianta, 2001; Palermo et al., 2007).

These findings suggest that the Spanish STRS-SF captures relational dimensions that are meaningfully connected to students' classroom functioning. However, because all measures were teacher-reported, these associations should be interpreted as relations among teachers' perceptions rather than as

independent evidence about student functioning. The data do not allow conclusions about directionality, nor do they distinguish whether student characteristics shape the relationship, the relationship shapes teacher perceptions of the student, or both processes operate simultaneously. Given the transactional nature of teacher-student relationships described in previous research (Emslander et al., 2025; Pakarinen et al., 2021), longitudinal and multi-informant designs will therefore be necessary to clarify the developmental and reciprocal processes underlying these associations, and to explore whether specific student profiles are more susceptible to negative or positive relationship cycles.

Several limitations also restrict the generalizability of the present findings. First, the modest sample size and its geographic concentration in Madrid may restrict the generalizability of findings to other Spanish-speaking populations and educational contexts. Although the sample size was sufficient for the analyses performed, future research should aim to increase both sample size and geographical diversity.

Second, the wide age range of students (from early childhood to late adolescence) poses challenges for interpreting the results across developmental stages. STRs are known to evolve significantly throughout schooling (Sabol & Pianta, 2012; Wang et al., 2018), potentially shaping and altering the way teachers perceive their relationships with students (Reddy et al., 2003; Roorda et al., 2011). Although the current dataset does not support subgroup analyses by educational level, future studies should investigate whether the STRS-SF demonstrates measurement invariance and differential associations across age groups.

Furthermore, the lack of factorial invariance testing limits our ability to confirm whether the structure of the scale holds across different subgroups (e.g., age, gender, educational stage). Future research should address this using multi-group CFA. Additionally, longitudinal designs may help examine the scale's sensitivity to relational changes over time. Finally, larger samples would allow the use of more advanced item-level analyses, such as Item Response Theory models, to further examine the functioning of specific items.

In light of the present results, the STRS-SF is a promising tool for assessing teacher-student relationships in Spanish-speaking educational settings. It may offer useful insights for interventions aimed at enhancing relational quality, promoting positive academic and social outcomes, and identifying students at risk. By monitoring these dynamics over time, educators and psychologists can design targeted strategies to strengthen these relationships, fostering safer and better learning environments (Roorda et al., 2011; Mashburn & Pianta, 2006). The present findings align with studies that have previously supported the psychometric properties of the STRS-SF in Mediterranean contexts (Settanni et al., 2015;

Tsigilis & Gregoriadis, 2008) while offering the first adaptation and validation of the short form in a Spanish-speaking population. This may be particularly relevant considering the specific structural and cultural characteristics of the Spanish educational system—such as its strong emphasis on inclusive education, high levels of teacher autonomy in classroom management, and particular norms regarding physical proximity and emotional expression.

Overall, this study contributes preliminary evidence on the cross-cultural applicability of the STRS-SF, while highlighting the importance of accounting for national educational frameworks and sociocultural norms when implementing relational assessment tools.

CONCLUSIONS

This study provides preliminary evidence supporting the psychometric functioning of the Spanish adaptation of the STRS-SF for assessing teacher–student relationships. The findings highlight its potential application in evaluating relational dynamics, supporting students at risk, and guiding interventions to improve educational outcomes. Despite its limitations, the STRS-SF shows promise as a tool for use in Spanish educational contexts. However, further research is needed to replicate these findings in larger and more diverse samples, examine measurement invariance across subgroups, and continue refining the instrument, particularly with regard to items that may be sensitive to contextual or cultural interpretation. Overall, this study contributes to the existing body of research on the cross-cultural applicability of the STRS-SF and highlights the importance of considering sociocultural factors when adapting relational assessment tools.

LIST OF ABREVIATIONS

APA: American Psychological Association

CFA: Confirmatory factor analysis

CFI: Comparative fit index

DWLS: Diagonally weighted least squares

EFA: Exploratory factor analysis

KMO: Kaiser–Meyer–Olkin

RMSEA: Root mean square error of approximation

SD: Standard deviation

STR: Student–teacher relationship

STRS: Student–Teacher Relationship Scale

STRS-SF: Student–Teacher Relationship Scale—Short Form

TLI: Tucker–Lewis index

WLS: Weighted least squares

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