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Examining factorial validity of the student–teacher relationship scale in the Iranian educational setting

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ABSTRACT

The Student–Teacher Relationship Scale (STRS) is widely used to evaluate the quality of student–teacher relationships in terms of Closeness, Conflict, and Dependency. The main purpose of this study was to examine factorial validity of the adapted-STRS proposed by Koomen et al. (2012) in the Iranian educational setting. Another purpose was to examine correlations of the Dependency scale with the Closeness and Conflict scales of the adapted-STRS, when applied in a non-western sociocultural context. Results of confirmatory factor analysis, using an item parceling approach, provided evidence for the three-factor structure of the adapted-STRS with scales indicating satisfactory internal consistency. Additionally, the Dependency scale was positively correlated with Closeness but not with Conflict in the Iranian context. These findings call for further examination of sociocultural influences on the nature and interpretation of dependent student–teacher relationships.

1. Introduction

The affective quality of the student–teacher relationship is an influential aspect of students' school experience (Davis, 2003; Sabol & Pianta, 2012). Three decades of empirical research have provided evidence that warm and supportive relationships with teachers are fundamental to students' academic success and socioemotional development (Roorda, Verschueren, Vancraeyveldt, Van Craeyevelt, & Colpin, 2014). In contrast, researchers have repeatedly found that negative student–teacher relationships negatively affect students' present and future development across social, emotional, behavioral, and academic domains (for an overview, see Lei, Cui, & Chiu, 2016; Roorda, Jak, Zee, Oort, & Koomen, 2017; Roorda, Zee, & Koomen, 2020). Additionally, student–teacher relationships are important not only for students' development, but also for teachers' wellbeing and their professional identity (Milatz, Lüftenegger, & Schober, 2015; Riley, 2009; Spilt, Koomen, & Thijs, 2011).

Researchers have often conceptualized and operationalized the quality of student–teacher relationships using an extended attachment framework (Verschueren & Koomen, 2012; Verschueren, 2015). Based on this theory, the quality of dyadic student–teacher relationship has commonly been defined in terms of the relationship dimensions of closeness, conflict, and dependency (Pianta, 1999; Sabol & Pianta, 2012; Verschueren & Koomen, 2012). Closeness is regarded as a positive relational dimension, referring to the degree of warmth, affection, and open communication and providing students with the emotional security and support to deal effectively with the socio-emotional and academic demands they face in school. In contrast, conflict and dependency are considered negative relational dimensions, both reflecting a lack of security and consequently interfering with children's ability to cope with demands in the school context (Koomen, Verschueren, van Schooten, Jak, & Pianta, 2012; Verschueren & Koomen, 2012). However, whereas conflict concerns discordant and negative interactions, dependency refers to overreliance, and clingy and possessive behaviors of the child toward the teacher (Verschueren & Koomen, 2012).

Pianta (2001) developed the Student–Teacher Relationship Scale (STRS) to assess teachers' view of the student–teacher relationship in terms of the three above-mentioned relationship dimensions. The STRS has been widely used in empirical research on student–teacher relationships in preschool and early elementary school grades and across many countries with different sociocultural contexts (Gregoriadis, Grammatikopoulos, Tsigilis, & Verschueren, 2020; Verschueren & Koomen, 2020). However, these studies have revealed some inconsistencies regarding the factor structure of the instrument as well as the inter-correlations between the three scales. Whereas several researchers have confirmed three-factor structure of the STRS and its

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28-item solution (e.g., Drugli & Hjemdal, 2013; Fraire, Longobardi, Prino, Sclavo, & Settanni, 2013; Gregoriadis & Tsigilis, 2008), others have had difficulties in confirming its factorial structure. Using confirmatory factor analysis (CFA), one study in Norway (Solheim, Berg-Nielsen, & Wichstrøm, 2012) did not support the original 28-item solution of the STRS and instead found evidence for a 25-item three-factor version. In another study, Mi-young and Neuharth-Pritchett (2011) tested measurement invariance across ethnic groups in a sample of 5-year-old students from the United States. In this study, a satisfactory fit of the three-factor model could not be established unless one closeness item and one dependency item was deleted from the STRS. Moreover, subsequent invariance testing showed that the factor structure differed across ethnic groups. Also on the basis of CFA, Milatz, Glüer, Harwardt-Heinecke, Kappler, and Ahnert (2014) revised the STRS for German-speaking countries (Germany, Austria). Their modified version consisted of three factors and 12 items, in which none of the original dependency items were included. These scholars attributed their findings to the culture-sensitive nature of the dependency construct and stressed that their work "reveals dependency to be a culturally biased construct, whereas closeness and conflict might appear culturally invariant" (p. 365). Besides difficulties confirming the factorial structure of Pianta's STRS, scholars have frequently criticized the dependency scale due to its low internal consistency, with Cronbach's alpha ranging from 0.40 to .74 (Doumen et al., 2009; Hamre & Pianta, 2001; Rey, Smith, Yoon, Somers, & Barnett, 2007).

Therefore, Koomen et al. (2012) developed a slightly revised version of the STRS (adapted-STRS) to improve the measurement of dependency and validated the dimensionality of this adapted version in a wide age range (3–12 years). The adapted-STRS showed an acceptable fit for the three-factor model for the entire age range. Moreover, the adapted dependency scale had a much higher internal consistency (Cronbach's alpha coefficient ranging from 0.77 to .79), compared to the scale in the original STRS (Koomen et al., 2012). Other studies, both conducted in the Dutch context and beyond (e.g., Tsigilis, Gregoriadis, & Grammatikopoulos, 2017; Tsigilis, Gregoriadis, Grammatikopoulos, & Zachopoulou, 2018), found the internal consistency of the adapted dependency scale to be satisfactory as well, with Cronbach's alphas ranging between 0.78 and .91. Therefore, we used the adapted-STRS instead of the original STRS in this study, since it seemed to be more appropriate in terms of thorough measurement of dependency and can be applied to a wider age range.

There has been another controversy in the interpretation of the dependency dimension. The findings of a series of Greek studies have suggested that dependency, in the Greek sociocultural context, shows positive correlations with closeness (ranging from 0.19 to .52) (Gregoriadis et al., 2020; Tsigilis et al., 2017, 2018). This is in contrast to the majority of other studies, in which the dependency-closeness correlation ranged from not-correlated to significantly and negatively correlated (from -0.46 to .06) (Koomen et al., 2012; Milatz et al., 2014; Mi-young & Neuharth-Pritchett, 2011;). With regard to the dependency-conflict correlation, the findings are inconsistent as well. Whereas some studies have reported a moderate or even strong positive correlation among dependency and conflict (ranging from 0.29 to .67) (Koomen et al., 2012; Mi-young & Neuharth-Pritchett, 2011; Solheim et al., 2012), Greek studies have found non-significant associations between these dimensions (Gregoriadis & Tsigilis, 2008; Gregoriadis et al., 2020).

Based on these findings, dependent relationships might be viewed and operate differently, depending on the sociocultural context (Gregoriadis & Tsigilis, 2008; Milatz et al., 2014; Verschueren & Koomen, 2020). Scholars mostly explain variations in the interpretation of dependency by focusing on differences on the individualistic-collectivistic cultural dimension (Triandis, 1989). It is argued that individualistic cultures are focused on the independence of individuals, whereas collectivistic cultures emphasize interdependence (Grotevant, 1998). Adults within individualistic cultures may therefore appreciate the autonomy of children and limit the formation and maintenance of interdependency, whereas adults in collectivistic cultures strive for interdependence and are oriented toward relatedness (Tamis-LeMonda et al., 2008).

Based on Hofstede's (2001) cultural framework, Iran can be considered to have a collectivistic culture. As far as we know, relationships between Iranian primary school teachers and students have not been studied to date. However, as student–teacher relationships seem to share important similarities with child–parent relationships, findings with regard to child–parent relationships may help us to gain insight about student–teacher relationships in the Iranian sociocultural context (Chen, Zee, Koomen, & Roorda, 2019; Pianta, Hamre, & Stuhlman, 2003). A study on Iranian mothers' interpretation of their children's need to be indulged in different attachment situations revealed that Iranian mothers most frequently attributed their children's dependent-like behaviors to seeking security and interdependence (Seyyed, Mazaheri, & Ghanbari, 2010). Also, Iranian mothers most frequently mentioned being positively responsive as the most proper reaction to these types of child behavior. Furthermore, two qualitative studies which aimed to identify parenting beliefs about child-rearing and parent-child interactions among Iranian parents revealed that Iranian parents considered being responsive to children, whenever they need, as a characteristic of an ideal parent (Hellisaz, Mazaheri, Panaghi, & Hassani, 2015; Seydi, Nazari, & Hasani, 2016). Together, these studies suggest that dependent relationships might been perceived less negative in the Iranian cultural belief system than in the western countries. Also Iranian adults might focus on proximity as a coping strategy with child–adult dependency.

2. Present study

The main purpose of the present study was to examine the dimensional structure of the adapted-STRS (Koomen et al., 2012) in the Iranian educational context. As far as we know, this instrument has not been used in Iran before. We first tested the three-factor model of closeness, conflict, and dependency of the adapted-STRS (Koomen et al., 2012), and then investigated the associations among these three dimensions in the Iranian sociocultural context. We hypothesized that the inter-correlations of the three dimensions would be similar to those found in Greek studies (Gregoriadis et al., 2020; Tsigilis et al., 2017, 2018), the culture of which can be considered largely similar to Iran, a collectivistic culture (Hofstede, 2001). More specifically, we expected dependency to be positively associated with closeness and unrelated to conflict.

3. Method

3.1. Participants and procedures

Participants were 119 teachers who taught 295 students (53 % girls), recruited through convenience sampling from preschool and regular elementary classrooms in Iran. We based our sample size on sample sizes reported in prior validation studies (e.g., Gregoriadis & Tsigilis, 2008) as well as guidelines from Myers, Ahn, and Jin (2011), recommending sample sizes of $N \geq 200$ for the theoretical model; and $N \geq 300$ for the population model. Even though our sample approximates this sample size, it should be noted that we collected data in the last month of 2019 and first two months of 2020, just before the Covid-19 pandemic in Iran. As a result, we were forced to stop our data collection process due school closures as a result of the pandemic. Consequently, our sample was slightly smaller than anticipated.

Among participating teachers, 81 % was female. This high percentage of female teachers is generally consistent with the overall population of teachers, both in Iran and in other countries (Mi-young & Neuharth-Pritchett, 2011; Tsigilis et al., 2018; Zee, Koomen, & Van der Veen, 2013; Zee, Rudasill, & Bosman, 2020). Distribution according to grade was as follows: $n = 34$ (14.9 %) preschool, $n = 36$ (12.5 %) Grade

1, $n = 46$ (15.6 %) Grade 2, $n = 49$ (16.6 %) Grade 3, $n = 42$ (14.2 %) Grade 4, $n = 35$ (11.9 %) Grade 5, and $n = 42$ (14.2 %) Grade 6. Students' mean age was 9.08 years ($SD = 1.9$, Range 4–12 years). Participating teachers' mean age was 33.31 years ($SD = 7.52$, Range 21–50 years) and they had 9.34 years of teaching experience ($SD = 8.23$, Range 1–29 years) on average. The number of participating students per class ranged between 1 and 6 ($M = 2.479$, $SD = 1.081$). All classes were taught by only one teacher. Teachers had to teach the specific child for at least two months before they reported their relationships on the STRS. Prior to participating, teachers were informed about the study's purpose and procedures and asked for their consent. Then, a digital survey link was sent to them. Teachers were asked to complete the digital questionnaires within two weeks. There were no incentives for the participating teachers.

3.2. Measures

3.2.1. Adapted student–teacher relationship scale (Adapted-STRS)

The adapted-STRS (Koomen et al., 2012) comprises 28 items that together assess three dimensions of affective student–teacher relationship quality. Closeness (11 items) measures the degree to which teachers experience the relationship with an individual student as warm, affectionate (e.g., *This child openly shares his/her feelings and experiences with me*). Conflict (11 items) measures the degree of negativity, anger, and unpredictability in the relationship (e.g., *This child and I always seem to be struggling with each other*) and Dependency (6 items) measures the extent to which teachers evaluate a student as overly dependent, resistant, needy, and clingy in the relationship (e.g., *This child reacts strongly to separation from me*). The items are rated on a five-point Likert scale from 1 ('definitely does not apply') to 5 ('definitely applies'). Satisfactory internal consistencies for the three scales have been reported by Koomen et al. (2012), with Cronbach's alpha of 0.88, 0.90, and 0.78 for Closeness, Conflict, and Dependency, respectively.

An Iranian version of the adapted-STRS was developed through a translation/back-translation procedure. First, items of the adapted-STRS were independently translated from English to Persian by the first author and a bilingual translator. Subsequently, a synthesis of the two translations was made. Then, the Persian version was back-translated to English by another translator. Afterwards, a comparison of the back-translated English version and the adapted-STRS was made and translation discrepancies were corrected. More specifically, we changed the Persian translation of one word (manipulative) and one phrase (after being disciplined) such that it better represented the original English sentences.

3.3. Data analysis

Using M*plus* version 7.4 (Muthen & Muthen, 1998), factorial validity of the adapted-STRS was explored in two steps. First, confirmatory factor analysis (CFA) was employed to examine the underlying three-factor structure of the adapted-STRS. Considering the number of items of the questionnaire and the limited sample size of the study, we used parcels as indicators of the latent variables. Parcels are combinations of items into small groups of items within scales or subscales and using them as construct indicators. According to Coffman and MacCallum (2005) and Matsunaga (2008), this option offers several advantages. It reduces the number of parameters in the model, improves the variable to sample size ratio, leads to a reduction in sampling error, and reduces the effects deviation from normality. Generally, an item parceling approach more likely leads to less biased parameter estimates achieving proper model solutions. In addition, the use of parcels reduces the influence of idiosyncratic features of the items (Bandalos and Finney, 2001). In this study, three parcels were considered for each latent variable and items were randomly assigned to the parcels.

Second, to determine the suitability of the three-factor model, two alternative models were tested as well: A one-factor model which examined the unidimensionality of the adapted-STRS, and a two-factor model which synthesized Conflict and Dependency into one latent construct measuring negative relationship quality. A chi-square difference test was performed to compare the fit of the three-factor model with two alternative models. After establishing the factor structure of the adapted-STRS, we estimated the reliability by computing Cronbach's alphas for individual STRS scales. The lowest acceptable alpha value can be regarded as 0.70 (Nunnally & Bernstein, 1994).

3.3.1. Model goodness-of-Fit

Inspection of the distributional properties of the STRS items revealed no serious departures from normality and linearity. Specifically, most parcels did not reach the skewness threshold of +/- 1.00, range = -1.124 – 0.927. Moreover, kurtosis values ranged from -0.722 and 1.035 (see Table 1). To deal with high skewness and kurtosis levels, we used robust maximum likelihood estimation to obtain parameters, as this estimator is robust to non-normality and enables the adjustment of standard errors (Muthen & Muthen, 1998-2012; Muthen and Muthen, 1998).

To address the multi-level data structure (students nested in classrooms) and prevent biased estimates, we examined the intraclass correlations (ICCs) to assess the proportion of the variation in the parcels that exists across classrooms (Woltman, Feldstain, MacKay, & Rocchi, 2012). Although there are no widely accepted criteria for assessing the value of ICC, it has been suggested that ICCs equal ≥ 0.05 render multilevel modelling necessary (Geldhof, Preacher, & Zyphur, 2014). Then, the model was estimated using the special feature for complex survey data available in the M*plus* software. This procedure corrects the standard errors and takes non-independence of observations into account, without explicitly modelling classroom-level variability (Muthen & Muthen, 1998–2011Muthen and Muthen, 1998Muthen & Muthen, 1998–2011). Of the total data set, 0.191 % of the data were missing. Little's MCAR test revealed that these data were missing completely at random (χ^2 (1139) = 1134.314, $p = 0.529$). Also, in more than half of these cases, only one item per subject was missing. Randomly missing data patterns were evident in teachers' reports of relationship quality (0.206 %) and social-emotional child behavior (0.176 %). We thus used Full Information Maximum Likelihood (FIML) for all models, which allows for efficient model estimation based on all available data (Enders, 2010).

The Satorra and Bentler (2010) scaled chi-square test was used to evaluate the overall fit of the factor models. As chi-square is sensitive to sample size, model fit was also evaluated using four additional fit indices: Root Mean Square Error of Approximation (RMSEA), Comparative Fix Index (CFI), Tucker–Lewis Index (TLI) and Standardized Root Mean Square Residual (SRMR). Values $\geq .95$ for TLI and CFI, ≤ 0.05 for RMSEA, and $\leq .08$ for SRMR indicate good model fit (Hu & Bentler, 1999; MacCallum, Browne, & Sugawara, 1996). A RMSEA value between 0.05 and 0.08 indicates fair fit and between 0.08 and 0.10 indicates mediocre fit (MacCallum et al., 1996).

4. Results

4.1. Dimensionality of the Adapted-STRS

Prior to main analysis, we inspected the intraclass correlations. The ICC values ranged between .015–.210 (see Table 1). Using parcels as indicators (see Table 2), CFA suggested an acceptable fit of the three-factor model to the data. This three-factor model fitted the data significantly better than the two-factor alternative model ($\Delta\chi^2$ (2) = 233.523, $p < 0.001$, ΔCFI= -.158, ΔSRMR = .074) and the one-factor alternative model ($\Delta\chi^2$ (3) = 568.296, $p < 0.001$, ΔCFI= -.443, ΔSRMR = .139). Descriptive statistics and factor loadings for parcels are presented in Table 1. All factor loadings were statistically significant, ranging from 0.65 to .93.

Cronbach's α coefficients for Closeness, Conflict, and Dependency were .86, .92, and .73, respectively. These values indicate satisfactory

Table 1
Descriptive Statistics and Standardized Factor Loadings for Parcels.

	Items[a]	Mean	*SD*	Skewness	Kurtosis	ICC	standardized factor loading
Cf. P 1	16, 17, 19	2.197	1.221	0.776	−0.638	.066	.856
Cf. P 2	11, 18, 20, 21	2.119	1.065	0.830	−0.344	.176	.920
Cf. P 3	2, 9, 14, 22	1.935	0.928	0.927	0.234	.169	.881
C. P 1	3, 4, 13	3.993	0.779	−0.792	0.486	.015	.740
C. P 2	1, 10, 23, 28	4.026	0.868	−1.102	0.940	.064	.929
C. P 3	5, 6, 24, 26	4.162	0.789	−1.124	1.035	.095	.737
D. P 1	7, 15	2.631	1.078	0.274	−0.684	.210	.660
D. P 2	8, 27	3.054	1.072	−0.031	−0.722	.122	.873
D. P 3	12, 25	2.944	0.985	0.080	−0.390	.127	.647

Note. C = Closeness; Cf = Conflict; and D = Dependency; P = Parcel; ICCs = IntraClass Correlations.
[a] Reflects the items which belong to the parcel (for a list of items see Appendix 1).

Table 2
Model Fit Indices of Hypothesized Three-factor Model, Two-factor Alternative Model, and One-factor Alternative Model.

Model	*df*	χ^2	RMSEA	CFI	TLI	SRMR
Three-factor	24	52.330	.063, 90 % CI = [.040−.087]	.975	.963	.060
Two-factor	26	237.256	.166, 90 % CI = [.147−.186]	.817	.746	.134
One-factor	27	566.528	.260, 90 % CI = [.242−.279]	.532	.375	.199

Note. RMSEA = Root Mean Square of Error of Approximation. CFI = Comparative Fit Index. TLI = Tucker–Lewis Index. SRMR = Standardized Root Mean Square Residual.

internal consistency for research purposes (Nunnally & Bernstein, 1994).

Table 3 represents the inter-correlations among the three latent factors as well as descriptive statistics for the three scales[1] . There was a moderate[2], negative association between Closeness and Conflict (r = -.613, $p < .001$), and a moderate, positive association between Closeness and Dependency (r = .570, $p < .001$). Dependency was not associated with Conflict (r = .003, p = .972).

5. Discussion

The present study investigated the factorial validity of the adapted-STRS (Koomen et al., 2012) in an Iranian sample. The STRS is the most widely used measure in student–teacher relationship research. To date, however, few studies have investigated the factor structure of the STRS as well as inter-correlations of the three scales within non-western socio-cultural settings. This study aimed to examine the dimensionality of the adapted-STRS and investigate the inter-correlations among closeness, conflict, and dependency in the Iranian sociocultural context. The main findings are summarized below.

Table 3
Descriptive Statistics and Pearson Correlation Coefficients for Adapted-STRS Scales.

	Pearson correlations		Mean	*SD*
	Closeness	Conflict		
Closeness	1		4.05	0.72
Conflict	−.613**	1	2.11	0.99
Dependency	.570**	.003	2.88	0.86

Note. *SD* = Standard Deviation.
** $p < .001$.

5.1. Dimensionality of the Adapted-STRS

First, we examined the underlying factor structure of the adapted-STRS as proposed by Koomen et al. (2012) in an Iranian sample. Adopting an item parceling approach, our confirmatory factor models revealed that the quality of student–teacher relationships, in the Iranian context, can be evaluated through the three relationship dimensions of closeness, conflict, and dependency. This finding is in line with results of Koomen et al. (2012) and two other studies (Tsigilis et al., 2017, 2018), in which the underlying factor structure of the adapted-STRS was investigated. However, results from Tsigilis et al. (2017) only confirmed the three-factor structure of the adapted-STRS after adopting an item parceling approach. According to these scholars, an item parceling approach, due to the aggregation of item ratings, has the advantage of reducing noise that is unrelated to the construct and accordingly increases the ratio of the true score to the total score.

5.2. Inter-correlations among closeness, conflict, and dependency

In line with studies in a Greek setting (Gregoriadis et al., 2020; Tsigilis et al., 2017, 2018), the patterns of inter-correlations among the three latent variables revealed the dependency scale to be positively associated with closeness and, but not associated with conflict. These findings are in contrast with results of studies within western sociocultural contexts such as the Netherlands (Koomen et al., 2012), Germany and Austria (Milatz et al., 2014), and the USA (Mi-young & Neuharth-Pritchett, 2011). It is suggested that dependent relationships may have different meanings in different socio-cultural contexts across the individualistic-collectivistic continuum (Hofstede, 1984; see Oyserman, Coon, & Kemmelmeier, 2002 for a review; Triandis, 1989). More specifically, whereas autonomy has commonly been perceived as an important value within individualistic cultures, child-adult relatedness is more encouraged within collectivistic cultures (Tamis-LeMonda et al., 2008). As a result, students' over-reliance toward the teacher might be considered an indicator of warm and close interpersonal relationships and, as such, perceived less negatively by teachers within collectivistic sociocultural contexts.

The suggested explanation for the culture-sensitive nature of student–teacher dependency is an extension of findings focused on cultural differences in affective parent–child relationships. To date, some studies have questioned the universal conceptualization of parent-child attachment relationships (Harkness & Super, 2002). For example, in

[1] Without controlling for non-invariance, in our study, preschool and early elementary school students (grades 1 to 3) scored higher on Closeness and Dependency and lower on Conflict than older elementary students. These differences, however, were statistically significant only for Dependency. Results of t-tests on mean differences were t (293) = 2.835 ($p < .01$) for Dependency, t (293) = 1.600 (p = 0.111) for Closeness, and t (293) = -.830 (p = 0.407) for Conflict.

[2] We used the guidelines of Floyd et al. (2006) to interpret correlation coefficients: Negligible to very weak (r = .00-.20), weak (r = .20-.40), moderate (r = .40-.70), high (r = .70-.90), and very strong (r = .90−1.00).

contrast with the emphasis placed by attachment researchers on superficial cultural differences in sensitivity (see Mesman, Van Ijzendoorn, & Sagi-Schwartz, 2016, for a review), Rothbaum, Pott, Azuma, Miyake, and Weisz (2000), Rothbaum, Weisz, Pott, Miyake, and Morelli (2000), Rothbaum, Kakinuma, Nagaoka, and Azuma (2007) discussed that, compared to American mothers, there are fundamental differences in Japanese mothers' expression of sensitivity and their interpretation of objectives of sensitivity (to foster autonomy or dependency). It is suggested that the American description of an insecure ambivalent mother–child relationship might include key ingredients of sensitive caregiving in Japan (Rothbaum, Pott et al., 2000; Rothbaum, Weisz et al., 2000). Rothbaum et al. (2007) investigated cultural differences in mothers' attributions in Amae[3] situations. More specifically, they wanted to know how American and Japanese mothers interpreted their children's need to be indulged. They found that Japanese mothers were likely to attribute their child's behavior to seeking security/interdependence. Taking a similar procedure to assess mothers' attributions, in an Iranian study mothers were more similar to Japanese mothers and they mostly attributed the child's behavior to seeking security (Seyyed et al., 2010). It is argued that the underlying, culturally-based belief system about sensitive caregiving extends to student–teacher relationships as well (Aukrust, Edwards, Kumru, Knoche, & Kim, 2003; Beyazkurk & Kesner, 2005; Cadima, Doumen, Verschueren, & Leal, 2015; Chen et al., 2019). The findings of this study, together with those of Greek studies (Gregoriadis et al., 2020; Tsigilis et al., 2017, 2018), regarding the inter-correlations among STRS dimensions, could challenge the universal conceptualization of student–teacher relationships. However, more studies are needed to investigate this issue.

6. Limitations and suggestions for future research

Several limitations of the current study should be noted. First, our research design cannot guarantee the generalizability of the findings since no specific sampling technique was followed and the sample size was limited. Research with representative samples could provide more information on the psychometric properties of the adapted-STRS, and the Dependency scale in particular, in the Iranian educational setting.

Second, since it was the first time that the STRS was applied in the Iranian educational context, starting the analysis with an exploratory factor analysis (EFA) and then using CFA would have been more appropriate. However, due to the corona pandemic we had to limit the size of our sample, which prevented us from creating two random samples that were substantial enough to do both EFA and CFA. To determine whether the a priori hypothesized model actually had the best fit to the data, we also tested theoretically plausible one-factor and two-factor models. This method thus may account for the fact that we did not perform an EFA.

Third, the modest sample size in this study prevented us from exploring the applicability of the STRS across various background characteristics, including gender and age. Given that differences in STRS-scores may occur between boys and girls and children of different ages (Koomen et al., 2012), and in our study a difference on Dependency between preschool and early elementary school students and older elementary students was evident, establishing measurement invariance is an important step in ensuring that such observed differences are not mere artifacts of measurement-related differences. There is previous evidence for the invariance of the adapted-STRS across gender (Tsigilis et al., 2018) and age, with exception of some isolated items ("This child whines or cries when he/she wants something from me", for instance), which may be less relevant for older children (Koomen et al., 2012). Therefore, it is advised that future researchers investigate the invariance of the Iranian version of adapted-STRS across age and gender.

Fourth, in our factor analyses, we used parcels as indicators instead of items. Besides the advantages of this approach, parceling may increase the Type II error rate by reducing the ability to identify misspecified models (Little, Cunningham, Shahar, & Widaman, 2002). Additionally, it is possible that different parcels (i.e. parcels including different items) lead to different results. It is suggested that future researchers do a sensitivity analysis (cross-validation) in different samples to check this assumption.

Fifth, we tested a two-level model in this study, thereby ignoring the potential clustering of classrooms within schools. In previous studies on student–teacher relationship quality, however, the variance at the school level has been found to reach zero (e.g., Zee et al., 2013). Nevertheless, consideration of the clustering of the classrooms within schools in future studies is required.

7. Conclusion

In conclusion, this study confirms the proposed three-factor structure of the adapted-STRS in the Iranian educational context. Mutual correlations between Closeness and Conflict provided further support for the validity of the Closeness and Conflict scales of the Iranian version of the adapted-STRS. However, the Dependency scale requires additional research: The findings of this study, regarding the associations with closeness and conflict, revealed that dependency may have different meanings in the Iranian sociocultural context compared with western cultures. Also, further support for the validity of dependency, in the Iranian context, is needed. The STRS can make important contributions in the field of school psychology and teacher counseling by providing a way to monitor and support relational processes in schools and to help teachers achieve a better understanding of the quality of their relationships with each of their students. It is also important for future research on student–teacher relationships in Iran, as it is the first validated Iranian measure for assessing student–teacher relationships quality. The findings of this study also add to the previous literature on the cross-cultural assessment of student–teacher relationship quality with the STRS. Finally, this study highlights the need for a more in-depth investigation of the construct of dependency and additional research on the predictors of dependent student–teacher relationships, cultural influences in the interpretation of dependency, and consequences of student–teacher dependency for students' development and school outcomes within non-western socio-cultural contexts.

Data availability statement

The data that support the findings of this study are available on request from the corresponding author.

Appendix 1 Items of the adapted-STRS (Koomen et al., 2012)

Items
1. I share an affectionate, warm relationship with this child.

(continued on next page)

[3] Amae is a Japanese term which is mostly considered equated with dependence.

(*continued*)

Items
2. This child and I always seem to be struggling with each other.
3. If upset, this child will seek comfort from me.
4. This child is uncomfortable with physical affection or touch from me.
5. This child values his/her relationship with me.
6. When I praise this child, he/she beams with pride.
7. This child reacts strongly to separation from me.
8. This child is overly dependent on me.
9. This child easily becomes angry with me.
10. This child tries to please me.
11. This child feels that I treat him/her unfairly.
12. This child asks for my help when he/she really does not need help.
13. It is easy to be in tune with what this child is feeling.
14. This child sees me as a source of punishment and criticism.
15. This child expresses hurt or jealousy when I spend time with other children.
16. This child remains angry or is resistant after being disciplined.
17. Dealing with this child drains my energy.
18. When this child is in a bad mood, I know we're in for a long and difficult day.
19. This child's feelings toward me can be unpredictable or can change suddenly.
20. Despite my best efforts, I'm uncomfortable with how this child and I get along.
21. This child whines or cries when he/she wants something from me.
22. This child is sneaky or manipulative with me.
23. This child openly shares his/her feelings and experiences with me.
24. My interactions with this child make me feel effective and confident.
25. This child fixes his/her attention on me the whole day long.
26. This child allows himself/herself to be encouraged by me.
27. This child needs to be continually confirmed by me.
28. This child seems to feel secure with me.

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