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The student-teacher relationship scale in a Greek sample of preadolescents: reliability and validity data

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ABSTRACT

The article examines the psychometric properties (reliability and validity) of the Greek version of the *Student-Teacher Relationship Scale* (STRS; Pianta, 2001), as well as the quality of this relationship in preadolescents. A large body of relevant research has examined the relationship between students and teachers during the preschool and early childhood years. In this study 28 teachers completed the STRS and the adaptive functioning subscale of the *Teacher's Report Form* for their 502 students (fifth and sixth graders). The results showed that STRS exhibited adequate internal consistency and low standard error of measurement. Confirmatory factor analysis replicated the three factors of the scale –conflict, closeness, and dependency– in the Greek sample of preadolescents. However, the student-teacher relationship presented a somewhat different picture compared to the U.S.A. samples of young students. For example, closeness and dependency were somewhat likely to co-exist in teachers' representations of relationships. Dependency shared little variance with the total relationship score and age and gender differences were observed. The expected findings emerged for the links with adaptive functioning. For example, conflict was the strongest (negative) correlate of adaptive functioning. The developmental implications of these data for the student-teacher relationship during preadolescence are discussed.

Key words: Student-teacher relationship, Preadolescence, Attachment, Student-teacher relationship scale.

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1. Introduction

During the last 20 years, there has been a growing interest in examining the student-teacher relationship in the fields of developmental and school psychology. From a developmental systems perspective (Lerner, 1998) relationships, and not actions in isolation, are the causes of development. As Pianta, Hamre, and Stuhlman (2003) have argued, the primary components of relationships between students and teachers are the features of the individuals, their representations of relationships, the processes through which information is exchanged, and external systemic influences. A relationship is a product of dynamic and reciprocal interactions among the above components across multiple occasions and in multiple contexts.

The Student-Teacher Relationship within the Attachment Framework

Attachment has been defined (Bowlby, 1979, p. 179) as "a way of conceptualizing the propensity of human beings to make strong affectational bonds to particular others and of explaining the many forms of emotional distress and personality disturbance, including anxiety, anger, depression and emotional detachment, to which unwilling separation and loss give rise". Optimally, the significant adult with whom the attachment is formed acts as a "secure base" (Bowlby, 1980), which means that s/he is an available, reliable, and responsive figure, capable of offering protection and help especially in times of stress. During infancy, the infant-mother bond provides the infant with experience for the construction of representational or internal working models (Bowlby, 1973), which are representations of the attachment figure in terms of availability and responsiveness, and of the self in terms of how acceptable s/he is in the eyes of the attachment figure. Attachment theory supports the view that, apart from the infant-mother bond, the individual forms multiple

attachments through the life span. The early working models are further developed up to adolescence, and from then on they tend to persist relatively unchanged.

Teachers are significant adult figures in students lives and may act as secondary caregivers, as "secure-base figures of convenience" (Waters & Cummings, 2000, p. 168), or as extensions of the parents (Davis, 2003). Each student (and teacher) brings to the classroom his or her own working model of the self and of relationships, which influences their expectations and responses. Students may form secure relationships with their teachers, characterized by low levels of conflict and high levels of closeness and support. In these cases, students' feel free to actively explore both their academic and social environment, are likely to develop various competencies, and to experience positive affect. Good student-teacher relationships are viewed as supporting student's motivation to explore, as well as their regulation of cognitive, social, and emotional skills (Davis, 2003). However, Kesner (2000) has argued that, despite the similarities to student-parent attachment, students do not form an attachment to their teacher in the same manner as they do with their parents. For example, the student-teacher relationship is of much shorter duration, and focuses only on school-related issues. In addition, students compete with each other for teacher's attention.

Student-Teacher Relationship and Student Outcomes

There is increasing evidence for the association between the quality of the student-teacher relationship and student outcomes. For example, it has been found that the quality of this relationship is significantly related to student's competencies with peers in the classroom (Birch & Ladd, 1998; Howes, 2000; Howes, Matheson, & Hamilton, 1994; Pianta & Nimetz, 1991; Pianta, LaParo, Payne, Cox, & Bradley, 2002); peer

acceptance (Birch & Ladd, 1997; Howes, Hamilton, & Matheson, 1994; Hughes & Kwok, 2006; Ladd, Birch, & Buhs, 1999; White & Kistner, 1992); problem behavior (Birch & Ladd, 1998; Hughes, Cavell, & Jackson, 1999; Ladd et al., 1999; Pianta, 1994; Pianta, Steinberg, & Rollins, 1985); concept development (Pianta, Nimetz, & Bennett, 1997); academic achievement (Birch & Ladd, 1996; Hamre & Pianta, 2001; Ladd & Burgess, 2001; Pianta et al., 1995; Pianta & Stuhlman, 2004); classroom engagement (Ladd et al., 1999); concurrent and future adjustment, grade retention, and special education referrals (Birch & Ladd, 1997; Pianta et al., 1995); cooperative participation and school liking (Ladd & Burgess, 2001); positive perceptions of school climate (Murray & Greenberg, 2000); and future achievement, disciplinary infractions, and school suspensions (Hamre & Pianta, 2001).

Moreover, a close and supportive relationship with the teacher may act as a source of resilience and protect student who are at several forms of risk, or compensate for an inadequate familial environment. For example, it has been found that a high-quality student-teacher relationship may mitigate the adverse effects of authoritarian parental attitude (Burchinal, Peisner-Feinberg, Pianta, & Howes, 2002); parental rejection (Hughes et al., 1999); maltreatment (Lynch & Cicchetti, 1992); minority status and low socioeconomic level (Baker, 1998; Burchinal et al., 2002); aggression (Hughes, Cavell, & Wilson, 2001; Meehan, Hughes, & Cavell, 2003); various problem behaviors (Baker, 2006); peer rejection (Wentzel & Asher, 1995); referral for retention or special education (Pianta et al., 1995); and school failure (Hamre & Pianta, 2005).

Age and Gender Differences

The vast majority of the aforementioned studies on the correlates and the developmental significance of the student-teacher relationship has been conducted with young student (attending kindergarten, first and second grade),

and fewer studies have examined the student-teacher relationship during later childhood and adolescence, or with a longitudinal design. This is, at least in part, due to the fact that the attachment perspective was used to guide all these investigations.

Longitudinal research suggested that there is consistency in the quality of the student-teacher relationship from preschool through early elementary school (Birch & Ladd, 1997; Howes, Phillipson, & Peisner-Feinberg, 2000; Pianta et al., 1995). In the only longitudinal investigation examining the impact of kindergarten student-teacher relationship through early adolescence (Hamre & Pianta, 2001) it was found that negativity (i.e., a composite of conflict and dependency) in this relationship predicted achievement test scores, disciplinary infractions, and school suspensions through eighth grade. During sixth and seventh grade, perceived support from teachers played a significant role in motivating the pursuit of academically-relevant social goals (Wentzel, 1994). Also, during sixth grade teacher support was related to student's school and class-related interests and to their pursuit of social goals; these, in turn, predicted pursuit of social goals and academic achievement during seventh grade (Wentzel, 1998). The above findings may mean that support in the student-teacher relationship may be particularly salient at transition points (i.e., transition from elementary to middle school in the U.S.A.).

Upon entry into adolescence the student-teacher relationship changes substantially. After the transition from elementary to middle school, young adolescents report declines in the nurturing qualities of the student-teacher relationship (Feldlaufer, Midgley, & Eccles, 1998; Midgley, Feldlaufer, & Eccles, 1989); they also report that teachers focus more on students' earning high grades, on competition, and on maintaining adult control, with a decrease in personal interest in students (Harter, 1996). During this transition, according to young adolescents' own perceptions, a developmental shift from an adult

orientation to a peer orientation has been found to occur, as well as a decline in felt security and an increase in the disengaged pattern of relatedness (Lynch & Cicchetti, 1997). During middle school, also, few students describe teachers as their friends or as the source of a close personal relationship (Lempers & Clark-Lempers, 1992).

On the contrary, it has been found that when middle schools meet young adolescents' developmental needs, by encouraging positive student-teacher interactions, by applying instructional techniques that focus on progress, effort, and mastery of goals, and by not emphasizing competition and comparison, young adolescents report higher motivation and emotional well-being (Roeser, Eccles, & Sameroff, 1998). Positive and supportive perceptions of the student-teacher relationship (both by teachers and by student) are associated with motivation, achievement, and social competence during middle school (Davis, 2006).

Enough research evidence exists supporting gender differences in the quality of the student-teacher relationships within the attachment framework. Boys are high in conflict and girls are high in closeness. This has been found in several investigations, where various methods have been used: teacher reports (Baker, 2006; Hamre & Pianta, 2001; Kesner, 2000; Murray & Murray, 2004), student reports (Bracken & Craine, 1994; Howes et al., 2000; Ryan, Stiller, & Lynch, 1994), and observations of student-teacher relationship (Ladd et al., 1999) among preschool and early elementary school-age students. In middle school also, girls report higher levels of felt security and emulation in their relationships with teachers compared to boys (Ryan et al., 1994).

The Student-Teacher Relationship Scale

Using the attachment framework, Pianta and Steinberg (1992) constructed the *Student-Teacher Relationship Scale* (STRS), to assess teachers' internal working models of relationships with their students. These models are hypothesized to guide

teachers' behavior toward students and to account for the large individual differences observed in the quality of the student-teacher relationship.

After some modifications, the final version of the STRS (Pianta, 2001) assesses three features of the student-teacher relationship quality: closeness, conflict, and dependency. Closeness reflects the degree of warmth and communication in the relationship, may function as a form of support, and is likely to facilitate self-expression, active exploration, and positive affect. Conflict in the student-teacher relationship consists in discordant interactions, and lack of rapport, limiting the use of the teacher as a source of support and possibly impairing student's learning and performance. Dependency refers to possessive and "clingy" behaviors, indicative of over-reliance on the teacher. Student with such a relationship with their teacher may not engage in classroom activities, but spend a large amount of time with their teacher. However, a relationship may be close without being a dependent one, or it may be dependent without necessarily being close. Dependency is expected to decline with age.

Pianta (2001) reported U.S.A. normative data from 275 teachers (all of whom were women) of 1,535 student (788 boys and 708 girls), ranging in age from 4 years 1 month through 8 years 8 months (mean age 5 years; i.e., preschool through grade 3). Nearly two-thirds of the student were Caucasian, and the remaining sample consisted of African American, Hispanic American, and Asian American students. Internal consistency (Cronbach *alpha*) ranged from 0.55 to 0.92 by student gender and ethnicity. Test-retest reliability during a 4-week interval, for a subsample of 24 teachers, was adequate, ranging from 0.76 to 0.92 for the three subscales.

Exploratory factor analysis (principal components analysis) with varimax rotation revealed a three-factor solution that accounted for 48.8% of the total variance. The three factors were labeled Conflict, Closeness and Dependency. Correlations among the three subscales were statistically significant, indicating a moderate-to-

strong degree of association in the expected directions among them. Comparisons of two age groups (age < 5 years and age > 5 years) showed that teachers reported more conflict and dependency in their relationships with older students, more closeness with younger students, and more positive overall relationships with younger students. All these results are consistent with developmental expectations for increasing autonomy with age. Moreover, concurrent validity was examined by the use of the *Teacher-student Rating Scale* (Hightower et al., 1986), which assesses behavior problems and competencies in the classroom. A moderate degree of association was found in the expected directions between STRS scores and behavior problems and competencies.

The three dimensions have been found in the U.S.A. in other studies among kindergarten students (Pianta et al., 1995; Saft & Pianta, 2001) and early elementary school student (Birch & Ladd, 1997), and appear to be relatively stable from preschool into second grade (Howes, 2000; Pianta et al., 1995). In all these investigations exploratory factor analysis was used. Furthermore, the expected positive links of a high-quality student-teacher relationship and academic adjustment were documented in a number of studies cited before (i.e., Birch & Ladd, 1996, 1997; Hamre & Pianta, 2001; Ladd & Burgess, 2001; Ladd et al., 1999; Murray & Greenberg, 2000; Pianta et al., 1995; Pianta, Nimetz, & Bennett, 1997; Pianta & Stuhlman, 2004). Overall, the STRS has shown satisfactory reliability and validity for young student.

Aims and Hypotheses

The aim of this study is primarily to provide reliability and validity (factorial, convergent, and divergent) data for the Greek version of the *Student-Teacher Relationship Scale* (Pianta, 2001), and secondarily to assess student-teacher relationship (i.e., closeness, conflict, and dependency) among fifth and sixth graders, within the attachment framework. From the above brief

review of the literature it is evident that little is known about the quality of this relationship during the upper elementary grades in comparison with the preschool years and lower elementary grades. The STRS has been used mainly with young student (preschool and early elementary school) (Pianta, 2001). With the use of confirmatory factor analysis, the Greek version of the STRS is expected to yield the same structure (i.e., conflict, closeness, and dependency) as the original instrument. Convergent and divergent validity are further examined with the use of a reliable and valid measure of academic performance and total adaptive functioning. Based on existing research evidence (reviewed above), a positive association is expected between a high-quality student-teacher relationship and academic and behavioral adjustment, and a negative association between a low-quality relationship and the students' adjustment. Statistically significant correlations are hypothesized to emerge among the three subscales of STRS, as in the original instrument (Pianta, 2001).

Age and gender differences are also examined. On the basis of attachment theory (Bowlby, 1980), it is hypothesized that closeness and dependency will be less salient characteristics of the student-teacher relationship in the sixth grade compared to the fifth grade. No specific prediction is made for age changes in conflict. On the basis of existing research evidence reviewed previously, teachers are expected to view their relationships with girls as more close and dependent than with boys, while the opposite is hypothesized for conflict.

2. Method

Participants

The sample consisted of 502 students, 231 (46.0%) of whom were fifth graders and 271 (54%) were sixth graders. Two-hundred and forty five (48.8%) were males and 257 (51.2%) were females. All 28 of these student's teachers

participated in the study. Six of them were males, and 22 were females. Teachers completed the instruments (see below, *Measures*) for each of their classroom students. There were 13 fifth-grade and 15 sixth-grade classrooms. Mean number of instruments completed by fifth-grade teachers is 18 (ranging from 9 to 24), and by sixth-grade teachers is 17.8 (ranging from 14 to 26).

The participants were from 11 public and private schools situated in the broader area of Athens and Piraeus. The schools were randomly selected, with the use of random selection process, from the catalogue of schools provided by the Ministry of Education. Students were located in areas with families of middle and lower-middle socioeconomic status. All teachers agreed to participate.

Measures

Student-Teacher Relationship Scale (STRS; Pianta, 2001) – Greek translation. The Greek translation of the STRS was used. The original scale was translated in Greek and then back into English.

The STRS is a 28-item self-report instrument, with a 5-point Likert-type rating scale, ranging from 1 (*Definitely does not apply*) to 5 (*Definitely applies*). It assesses teacher's perceptions of his or her relationship with a student in terms of conflict, closeness, and dependency.

The Conflict subscale consists of 12 items assessing the degree to which a teacher perceives his or her relationship with a student as negative and conflictual. Example item is "This student and I always seem to be struggling with each other". Scores range from 12 to 60. High scores indicate high conflict. Item 19 is reverse scored.

The Closeness subscale consists of 11 items assessing the degree to which a teacher perceives his or her relationship with a student as affectionate and warm, and experiences open communication with him or her. Example item is "I share an affectionate, warm relationship with this student". Scores range from 11 to 55. High

scores indicate high closeness. Item 4 is reverse scored.

The Dependency subscale consists of 5 items assessing the degree to which a teacher perceives a student as overly dependent. Example item is "This student reacts strongly to separation from me". Scores range from 5 to 25. High scores indicate high dependency.

The Total scale assesses the degree to which a teacher perceives his or her relationship with a student overall as positive and effective. Higher Total scale scores reflect lower levels of conflict and dependency, higher levels of closeness, and a generally more positive relationship. Total scale scores range from 28 to 140.

Academic performance and total adaptive functioning. Teachers completed the academic performance and total adaptive functioning subscale of the *Teacher's Report Form* (TRF; Achenbach & Rescorla, 2001). The Greek standardization of this instrument was used (Roussos et al., 1999). Adaptive functioning consists of the teacher's assessment of how hard the student is working, how appropriately s/he is behaving, how much s/he is learning, and how happy s/he is. The reliability and validity of this instrument has been widely documented (Achenbach & Rescorla, 2001).

Procedure

The instruments were administered to teachers by the second author, as part of a larger research program on student-teacher relationships and student's school adjustment. The instructions given to the teachers were that they were going to participate in a research assessing student-teacher relationship and the student's school adjustment.

All teachers returned the completed instruments within one month. There were no missing responses in the instruments. Confidentiality of teachers' responses was maintained. Teachers were not paid, but were thanked for participating in this testing procedure.

3. Results

Descriptive Statistics

Tables 1, 2 and 3 show the descriptive statistics for the STRS and its subscales for the total sample, and for each gender and grade. As can be seen in Table 1, the distribution of scores is mildly skewed, indicating the teachers' tendency to view relationships with their students somewhat positively. This finding is similar to the one reported by Pianta (2001) for kindergarten and first-grade students.

Table 2 shows that boys have higher Conflict scores, while girls have higher Closeness, Dependency and Total scores. Based on Cohen's (1988) measure of effect size d , the actual difference between boys and girls in mean scores was in the medium level. As shown by the *Levene test*, boys were more heterogeneous as to closeness scores than girls, $F = 22.681$, $p < 0.0001$; and girls were more heterogeneous as to dependency scores than boys, $F = 25.584$, $p < 0.0001$.

Fifth graders have higher Conflict, Closeness, and Dependency scores than sixth graders (see Table 3). Based on Cohen's d measure of effect size, the actual difference between fifth and sixth graders in mean scores was rather small; only for Dependency the effect size was in the medium level.

Reliability of the STRS

Internal consistency reliability estimates

(Cronbach α) for the Total scale as well as for the Conflict and Closeness subscales were high (ranging from 0.82 to 0.92 by gender and grade). Somewhat lower was the reliability for the Dependency subscale: 0.73 (ranging from 0.66 to 0.76 by gender and grade). However, this reliability coefficient is higher than the one reported by Pianta (2001) for the normative sample of young students (0.64, ranging from 0.64 to 0.65 by gender). This lower internal consistency of the Dependency subscale may be partly due to the fact that it consists of five items.

Furthermore, compared with the findings from the normative sample of young student (Pianta, 2001), the standard error of measurement for the three subscales, the Total scale, and for each gender appeared to be lower in the Greek sample.

Item-Level Statistics

Table 5 presents item-level statistics, that is, means, standard deviations, and item-total correlations for each of the 28 items of the STRS.

Some items (e.g., 1, 7, 19, 28) were negatively skewed, approaching the upper end of the scale limit. Pianta (2001) obtained a similar finding but the skewness was larger in his normative sample of young student. Some other items (e.g., 2, 4, 16) were positively skewed approaching the lower end of the scale limit, a finding similar to Pianta's (2001) too.

Table 1
Descriptive Statistics for STRS Scale and Subscales

Scale/subscale	<i>M</i>	<i>SD</i>	Minimum/ Maximum	Skewness	Kurtosis
Conflict	20.68	8.29	12-53	1.24	1.31
Closeness	40.97	7.07	22-55	-0.31	-0.55
Dependency	11.21	3.79	5-24	0.55	-0.04
Total	111.09	12.81	60-135	-0.82	0.69

Table 2
Descriptive Statistics for STRS Scale and Subscales by Student Gender

Scale/subscale	Boys ^a				Girls ^b				t	d ^c		
	M	SD	Min/Max	Skewness	Kurtosis	M	SD	Min/Max			Skewness	Kurtosis
Conflict	22.21	9.26	12-53	1.04	0.49	19.22	6.96	12-52	1.29	1.93	4.10***	0.36
Closeness	39.42	6.93	22-55	-0.32	-0.50	42.45	6.90	25-55	-0.33	-0.69	-4.90***	0.44
Dependency	10.42	3.17	5-24	0.48	0.72	11.96	4.16	5-23	0.39	-0.66	-4.68***	0.42
Total	108.8	13.81	63-133	-0.68	0.01	113.26	11.39	60-135	-0.88	1.61	-3.96***	0.35

^an = 245. ^bn = 257. ^cCohen's d effect size.
*** p < 0.001

Table 3
Descriptive Statistics for STRS Scale and Subscales by Student Grade

Scale/subscale	5th grade ^a				6th grade ^b				t	d ^c		
	M	SD	Min/Max	Skewness	Kurtosis	M	SD	Min/Max			Skewness	Kurtosis
Conflict	21.65	8.38	12-52	0.96	0.67	19.85	8.14	12-53	1.53	2.23	2.42*	0.22
Closeness	41.98	6.73	22-55	-0.36	-0.40	40.11	7.25	22-55	-0.23	-0.66	2.97**	0.27
Dependency	12.06	3.85	5-23	0.04	-0.45	10.48	3.58	5-24	1.08	1.25	4.75***	0.43
Total	110.27	13.66	60-135	-0.68	0.43	111.78	12.02	63-132	-0.96	0.96	-1.31	0.12

^an = 231. ^bn = 271. ^cCohen's d effect size.
* p < 0.05 ** p < 0.01 *** p < 0.001

Table 4
Alpha Coefficients and Standard Errors of Measurement (SEM) for STRS Scale and Subscales for the Total Sample, Student Gender, and Student Grade

Scale/ subscale	Total Sample ^a		Boys ^b		Girls ^c		5th grade ^d		6th grade ^e	
	a	SEM	a	SEM	a	SEM	a	SEM	a	SEM
Conflict	0.91	2.49	0.92	2.62	0.88	2.41	0.92	2.37	0.89	2.70
Closeness	0.86	2.66	0.83	2.86	0.83	2.84	0.86	2.52	0.82	3.08
Dependency	0.73	1.97	0.66	1.85	0.76	2.04	0.73	2.00	0.72	1.89
Total	0.86	4.79	0.88	4.78	0.84	4.56	0.90	1.37	0.83	4.96

^aN = 502. ^bn = 245. ^cn = 257. ^dn = 231. ^en = 271.

Table 5
Item Means, Standard Deviations, and Item-Total Correlations for the Total Sample

	Item	M	SD	Item-total correlation
1.	I share an affectionate, warm relationship with this child.	4.14	0.82	0.58
2.	This child and I always seem to be struggling with each other.	1.45	0.82	0.61
3.	If upset, this child will seek comfort from me.	3.30	1.13	0.34
4.	This child is uncomfortable with physical affection or touch from me.	1.53	0.89	0.24
5.	This child values his/her relationship with me.	3.77	0.98	0.45
6.	This child appears hurt or embarrassed when I correct him/her.	3.38	1.18	-0.03
7.	When I praise this child, he/she beams with pride.	4.50	0.74	0.22
8.	This child reacts strongly to separation from me.	2.01	1.08	-0.14
9.	This child spontaneously shares information about himself/herself.	3.52	1.22	0.25
10.	This child is overly dependent on me.	1.98	1.09	-0.16
11.	This child easily becomes angry with me.	2.00	1.11	0.62
12.	This child tries to please me.	3.81	1.00	0.40
13.	This child feels that I treat him/her unfairly.	1.77	0.89	0.64
14.	This child asks for my help when he/she really does not need help.	1.88	1.04	0.12
15.	It is easy to be in tune with what this child is feeling.	3.72	1.02	0.58
16.	This child sees me as a source of punishment and criticism.	1.67	0.93	0.62
17.	This child expresses hurt or jealousy when I spend time with other children.	1.95	1.07	0.28
18.	This child remains angry or is resistant after being disciplined.	1.91	1.11	0.61
19.	When this child is misbehaving, he/she responds well to my look or tone of voice.	4.15	0.97	0.58
20.	Dealing with this child drains my energy.	1.77	1.05	0.62
21.	I've noticed this child copying my behavior or ways of doing things.	2.15	1.20	0.08
22.	When this child is in a bad mood, I know we're in for a long and difficult day.	1.74	1.06	0.58
23.	This child's feelings toward me can be unpredictable or can change suddenly.	1.77	1.05	0.65
24.	Despite my best efforts, I'm uncomfortable with how this child and I get along.	1.87	1.08	0.69
25.	This child whines or cries when he/she wants something from me.	1.52	0.95	0.36
26.	This child is sneaky or manipulative with me.	1.37	0.76	0.49
27.	This child openly shares his/her feelings and experiences with me.	3.63	1.07	0.38
28.	My interactions with this child make me feel effective and confident.	3.95	0.90	0.62

Item-total correlations ranged from 0.22 to 0.69 and for 16 items these correlations were in the 0.40 to 0.69 range. There was one exception though: five items had very low (even negative) item-total correlations. These were items 6, 8, 10, 14 (all four belong to the Dependency subscale), and 21 (it belongs to the Closeness subscale). This means that dependency shared little variance with the Total scale score, and item 21 (i.e., "I've noticed this student copying my behavior or ways of doing things") "behaves" like a Dependency item.

Relationship between STRS Scale and Subscales

Table 6 presents Pearson product-moment correlations among the subscales and between each subscale and the Total scale score. All correlations were statistically significant. As expected, Conflict had a moderate negative correlation with Closeness (i.e., $r = -0.40$, $p < 0.001$; Pianta [2001] reported $r = -0.45$, $p < 0.001$). Unexpectedly though, Closeness was positively and moderately related to Dependency (i.e., $r = 0.46$, $p < 0.001$; Pianta [2001] found a low positive correlation, i.e., $r = 0.12$, $p < 0.01$). Moreover, Conflict had a low positive correlation with Dependency (i.e., $r = 0.15$, $p < 0.01$; Pianta [2001] found a low-to-moderate positive correlation, i.e., $r = 0.28$, $p < 0.001$). Finally, Dependency shows a low negative correlation with the Total score (i.e., $r = -0.14$, $p < 0.01$),

whereas Pianta (2001) found a moderate negative correlation (i.e., $r = -0.35$, $p < 0.001$).

Factor Structure of the STRS

Confirmatory factor analysis (CFA) with the maximum likelihood method was used to assess the theoretical model for the STRS. Three latent constructs –conflict, closeness, and dependency– were implied by the three-factor model. The hypothesized three-factor model was compared against a competing one-factor model and a competing two-factor model. The competing one-factor model had all 28 items loading onto a single factor. The competing two-factor model had all closeness and dependency items loading onto the same first factor, based on the moderate positive correlation between the two dimensions (see Table 6), and all the conflict items loading onto the second factor.

For all models we specified independence of error terms, and for the three factor models, we allowed the factors to be correlated. A number of approaches were used to assess the fit of the CFA models, including the Comparative Fit Index (CFI), the Incremental Fit Index (IFI), the Chi-Square Goodness of Fit Test, and the Root Mean Square Error of Approximation (RMSEA) (Mueller, 2000). There are a variety of guidelines for interpreting the fit of a specific model based on these indices. For the CFI and IFI indices, values above 0.90 and 0.95 are taken to reflect acceptable and excellent fit to the data respectively (Hu & Bentler, 1999). RMSEA values of less than 0.05 indicate a good fit, and values as high as 0.08 indicate a reasonable fit (Hu & Bentler, 1999). A statistically significant chi-square value suggests poor fit, but this test is very sensitive to sample size and may be statistically significant when N is large, as it is in the current study (Mueller, 2000). Akaike's information criterion (AIC) was used to compare the fitness of the three models. The model that yields the smallest value of AIC is considered to be the best compromise between goodness of fit and parsimony. CFA was carried out using the AMOS 4.01 package.

Table 6
Correlations Between STRS Subscales and Total Scale

	Closeness	Dependency	Total
Conflict	-0.40***	0.15**	-0.91***
Closeness		0.46***	0.67***
Dependency			-0.14**

Note. $N = 502$.

** $p < 0.01$ *** $p < 0.001$ (two-tailed)

Table 7
Fit Indices from Confirmatory Factor Analyses

Model	χ^2	df	p	RMSEA	IFI	CFI	AIC
1	1451.31	350	< 0.001	0.119	0.71	0.69	1493.57
2	1265.29	349	< 0.001	0.101	0.86	0.82	1389.29
3	1148.04	347	< 0.001	0.068	0.96	0.90	1166.04

Note. Model 1 = one-factor competing model; model 2 = two-factor competing model; model 3 = three-factor hypothesized model; RMSEA = Root-Mean-Square Error of Approximation; CFI = Comparative Fit Index; IFI = Incremental Fit Index; AIC = Akaike's Information Criterion.

Table 8
Parameter Estimates for Confirmatory Factor Analyses of STRS - Three-Factor Model

Item	Subscale		
	Conflict	Closeness	Dependency
1. I share an affectionate, warm relationship with this child.		0.77	
2. This child and I always seem to be struggling with each other.	0.68		
3. If upset, this child will seek comfort from me.		0.73	
4. This child is uncomfortable with physical affection or touch from me.		-0.31	
5. This child values his/her relationship with me.		0.82	
6. This child appears hurt or embarrassed when I correct him/her.			0.43
7. When I praise this child, he/she beams with pride.		0.53	
8. This child reacts strongly to separation from me.			0.72
9. This child spontaneously shares information about himself/herself.		0.78	
10. This child is overly dependent on me.			0.73
11. This child easily becomes angry with me.	0.71		
12. This child tries to please me.		0.69	
13. This child feels that I treat him/her unfairly.	0.64		
14. This child asks for my help when he/she really does not need help.			0.48
15. It is easy to be in tune with what this child is feeling.		0.70	
16. This child sees me as a source of punishment and criticism.	0.59		
17. This child expresses hurt or jealousy when I spend time with other children.			0.51
18. This child remains angry or is resistant after being disciplined.		0.72	
19. When this child is misbehaving, he/she responds well to my look or tone of voice.	-0.63		
20. Dealing with this child drains my energy.	0.58		
21. I've noticed this child copying my behavior or ways of doing things.		0.53	
22. When this child is in a bad mood, I know we're in for a long and difficult day.	0.64		
23. This child's feelings toward me can be unpredictable or can change suddenly.	0.67		
24. Despite my best efforts, I'm uncomfortable with how this child and I get along.	0.79		
25. This child whines or cries when he/she wants something from me.	0.44		
26. This child is sneaky or manipulative with me.	0.43		
27. This child openly shares his/her feelings and experiences with me.		0.80	
28. My interactions with this child make me feel effective and confident.		0.81	

Table 7 presents fit indices for the confirmatory factor analyses. Fit estimates for the one-factor model are not good. Factor loadings are evenly distributed from 0.07 to 0.69. The two-factor model provides a better but not acceptable fit for the data. Results revealed the best fit for the hypothesized three-factor model, which achieved the lowest AIC value, the lowest RMSEA value, and the highest IFI and GFI values. The fit indices suggest that the hypothesized model has acceptable fit. The χ^2 -value for the three-factor model is still significant but this could result because of the large sample size.

Table 8 shows factor loadings for the three-factor model. The loadings range from 0.43 to 0.79 for Conflict, from -0.31 to 0.82 for Closeness, and from 0.43 to 0.73 for Dependency.

Convergent and Divergent Validity of the STRS

Relations of the STRS with academic and behavioral outcomes were assessed. Table 9 shows the correlations between the STRS and academic performance, as well as between the STRS and indices of adaptive functioning, as assessed by the teachers.

As expected, academic performance was negatively correlated with Conflict and positively correlated with Closeness, although it was not

associated with Dependency. Conflict had the expected negative correlations with teachers' assessments of how hard their students were working (moderate), how appropriately they were behaving (moderate to high), how much they were learning (low to moderate), and how happy they were (low to moderate). Also, Closeness was positively associated with how hard the students were working (moderate), how appropriately they were behaving (moderate), how much they were learning (low) and how happy they were (moderate). For Dependency, only a low positive correlation was found with how appropriately they were behaving; all other associations were nonsignificant.

3. Discussion

In general, the hypotheses of this investigation were confirmed, though with a few meaningful exceptions. The Greek version of the *Student-Teacher Relationship Scale* (Pianta, 2001) showed satisfactory internal consistency. Reliability coefficients were higher in the Greek sample of preadolescents than in the normative sample of young students in the U.S.A. The standard error of measurement was lower in the Greek than in the American sample. Furthermore, the distinction among the three features of the

Table 9
Correlations Among STRS Subscales, Academic Performance and Adaptive Functioning in the School

Subscales	Academic Performance	Hard Working	Appropriate Behavior	Learning	Happy
Conflict	-0.25***	-0.32***	-0.57***	-0.22***	-0.22***
Closeness	0.32***	0.37***	0.32***	0.19***	0.30***
Dependency	-0.10	0.08	0.10*	-0.06	-0.01

Note. N = 502.

* $p < 0.05$. ** $p < 0.01$ *** $p < 0.001$ (two-tailed)

quality of the student-teacher relationship—conflict, closeness, and dependency—is replicated in the sample of Greek preadolescents. These dimensions have been found in the U.S.A. with kindergarten samples (Pianta et al., 1995; Saft & Pianta, 2001), early elementary school samples (Birch & Ladd, 1997), and appear to be relatively stable from preschool into second grade (Howes, 2000; Pianta et al., 1995).

However, in the Greek sample of preadolescents, there appear to be some differences in the inter-relationship among the aspects of the student-teacher relationship, and this may reflect differences in the quality of this relationship during this age period, compared to early childhood. The moderate positive association between closeness and dependency (which is larger than the one reported by Pianta, 2001 for young students), and the finding that closeness tended to decrease from the fifth to the sixth grade imply that closeness is a less desirable feature of student-teacher relationship for preadolescents compared to young student, and that it is likely to characterize a dependent relationship. There exists some research evidence—mainly from the U.S.A.—implying that during the upper elementary grades (fifth and sixth grade) closeness is a desirable but at the same time not the only index of a high-quality student-teacher relationship. For example, it has been found that for third through fifth graders both autonomy support and optimal structure, which, by definition, do not require much closeness between the teacher and the student, contribute positively to student's motivation across the school year (Skinner & Belmont, 1993). And, although teacher support during sixth grade was a positive predictor of interest in class and of social responsibility goal pursuit (Wentzel, 1998), not only nurturance but also maturity demands on the part of the teacher predicted facets of student's school adjustment (Wentzel, 2002). More specifically, it was found that maturity demands (i.e., high expectations) positively predicted student's goals and interests, and that

lack of nurturance (i.e., negative feedback) negatively predicted academic performance and social behavior.

In addition, our data suggest that in preadolescents, compared to young student in Pianta's (2001) sample, dependency had a low negative association with the total score (which indicates a high-quality student-teacher relationship). If we also take into account the finding that dependency tended to decrease from the fifth to the sixth grade, we can conclude that dependency is less normative for preadolescents than for young student. These findings may be explained as indicating that during late childhood or preadolescence a more disengaged pattern of relatedness to teachers is very likely. An increase in the disengaged pattern of relatedness was found during the transition to middle school in the U.S.A. (Lynch & Cicchetti, 1997). The idea that dependency is a less normative way of relating to teachers during this age period is also supported by the finding that it is a strong predictor of internalizing problems during third, fourth and fifth grade (Murray & Murray, 2004).

As for the convergent and divergent validity of the STRS, the expected findings emerged for the associations among the STRS subscales and academic performance and adaptive functioning. Conflictual relationships with teachers are more likely among preadolescents with low academic performance and low adaptive functioning, whereas close relationships with teachers are more likely among preadolescents with high academic performance and high adaptive functioning. The highest correlation was found between conflict and appropriate behavior, a finding that is consistent with existing research evidence suggesting that during preschool and early elementary school period relational negativity and conflict in the teachers' representations of their relationships with students are more strongly related to students' behavior than other dimensions (Stuhlman & Pianta, 2001); also, in the same age group negative relationships with teachers have been found to be more likely

among student exhibiting moving against (i.e., aggressive) behaviors, whereas student's moving toward (i.e., prosocial) behaviors are not related to aspects of student-teacher relationship (Birch & Ladd, 1996, 1998; Hamre & Pianta, 2001; Ladd et al., 1999; Ladd & Burgess, 1999). A similar pattern has emerged for student followed longitudinally through eighth grade (Hamre & Pianta, 2001). All these data imply that there exists domain specificity in the associations of student-teacher relationships with student outcomes. In general, negativity is a particularly salient aspect of teachers' relationship experience, whereas closeness and support is the most salient from the students' perspective (Pianta et al., 2003).

Dependency was not associated with academic and behavioral outcomes. One should take into account that dependency was assessed with only five items, that this subscale had the lowest internal consistency than the other two, and that it shared little variance with the total score. All these findings imply that dependency needs further validation by examining the way Greek teachers interpret it, as Pianta himself argued (Pianta, personal communication, November 1, 2006), as well as by investigating its links with student outcomes during late childhood.

Despite the fact that all the above associations are influenced by shared method variance (teachers assessed both their relationships with students and the students' school adjustment), the correlation coefficients in general do not exceed moderate values. This means that, despite their low academic and general adaptive functioning, some students have close and warm relationship with their teacher, and some high functioning students have conflictual or dependent relationships with their teacher. This finding is in agreement with the finding of other investigations (e.g., Howes, 2000) among young students, that only a small percentage of variance in student-teacher relationship quality is explained by student's problem behavior. The only exception was the moderate-to-high correlation between conflict in

student-teacher relationship and inappropriate behavior of the student, a finding supporting the robustness of this association, as discussed previously. The moderate associations between teachers' perceptions of their relationships with students and students' academic and behavioral functioning also support the view that student-teacher relationship (and therefore the *Student-Teacher Relationship Scale*) constitute a unique source of variance in the classroom –the relationship itself– that is different from teacher reports of student's competencies and problems (e.g., the *Teacher's Report Form* subscales). This has been found for preschool and early elementary school-aged students (Birch & Ladd, 1998; Hamre & Pianta, 2001; Howes, 2000; Stuhlman & Pianta, 2001), from preschool through eighth grade (Hamre & Pianta, 2001), and for the upper elementary grades in this study.

Boys were found to have more conflictual relationships with their teachers than girls, and girls were found to experience more close and more dependent relationships than boys, although there is some heterogeneity among boys as to closeness, and among girls as to dependency. These findings are in agreement with existing investigations (Baker, 2006; Bracken & Craine, 1994; Hamre & Pianta, 2001; Howes et al., 2000; Kesner, 2000; Ladd et al., 1999; Murray & Murray, 2004; Ryan et al., 1994). A possible explanation for this systematic gender difference is that boys show more frequent antisocial behaviors (i.e., aggression), which are usually viewed negatively by teachers; another explanation is that the majority of teachers – in this study too – are females, who may view male students less positively than girls (Rong, 1996).

The findings of this study suggest that the *Student-Teacher Relationship Scale* (Pianta, 2001), which assesses teachers' representations of their relationships with their students, can be a reliable and valid measure during late childhood or preadolescence in Greece, with the exception of the dependency subscale which seems to require further validation. From the validity data, it appears

that a positive student-teacher relationship is a developmental asset for this age group, and not only for preschool age and early childhood (see Pianta, 1999). A limitation of this study is that the student's representations of relationships were not assessed. Future research should focus on examining both teachers' and students' representations of relationships during late childhood. Also, future research may examine the links between these representations and student's school adjustment, in order to test the degree to which the school context, and especially the student-teacher relationship, matches the students' developmental needs.

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Η κλίμακα σχέσης μαθητή-δασκάλου σε Έλληνες προεφήβους: αξιοπιστία και εγκυρότητα

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ΠΕΡΙΛΗΨΗ

Στόχος της έρευνας αυτής ήταν να εξετάσει τις ψυχομετρικές ιδιότητες (αξιοπιστία και εγκυρότητα) της ελληνικής εκδοχής της *Κλίμακας Σχέσης Μαθητή-Δασκάλου* (*Student-Teacher Relationship Scale - Pianta, 2001*), καθώς και την ποιότητα της σχέσης αυτής σε Έλληνες προεφήβους. Η ανασκόπηση της βιβλιογραφίας έδειξε ότι οι περισσότερες σχετικές έρευνες έχουν εστιάσει στη σχέση δασκάλου-παιδιού κατά την προσχολική και πρώτη σχολική ηλικία. Ένα δείγμα 28 δασκάλων συμπλήρωσαν την κλίμακα και την υποκλίμακα προσαρμοστικής λειτουργικότητας του *Ερωτηματολογίου για Εκπαιδευτικούς* (Achenbach & Rescorla, 2001 Rousos et al., 1999) για τους 502 μαθητές τους που φοιτούσαν στην Ε' και στην Στ' δημοτικού. Η κλίμακα είχε ικανοποιητική αξιοπιστία εσωτερικής συνέπειας και χαμηλό τυπικό σφάλμα μέτρησης. Η επιβεβαιωτική ανάλυση παραγόντων ανέδειξε τους τρεις παράγοντες της κλίμακας – σύγκρουση, εγγύτητα και εξάρτηση. Ωστόσο, η σχέση μαθητή-δασκάλου παρουσίασε μια κάπως διαφορετική εικόνα στην Ελλάδα σε σύγκριση με τα δεδομένα από τις ΗΠΑ, τα οποία προέρχονται από μικρότερης ηλικίας παιδιά. Για παράδειγμα, η εγγύτητα και η εξάρτηση έτειναν να συνυπάρχουν στις αναπαραστάσεις των δασκάλων για τις σχέσεις. Η εξάρτηση είχε μικρή σχέση με το συνολικό βαθμό στην κλίμακα. Παρατηρήθηκαν επίσης διαφορές ηλικίας και φύλου. Τα ευρήματα για τη σχέση με την προσαρμοστική λειτουργικότητα ήταν τα αναμενόμενα. Για παράδειγμα, η σύγκρουση ήταν ο πιο ισχυρός (αρνητικός) προβλεπτικός δείκτης της προσαρμοστικής λειτουργικότητας. Συζητούνται οι αναπτυξιακές υποδηλώσεις αυτών των δεδομένων για τη σχέση μαθητή-δασκάλου κατά την προεφηβεία.

Λέξεις-κλειδιά: Σχέση μαθητή-δασκάλου, Προεφηβεία, Δεσμός, Κλίμακα σχέσης μαθητή-δασκάλου.

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