



# The Qualities of Teacher–Child Relationships and Self-Regulation of Children at Risk in the United States and Turkey: The Moderating Role of Gender

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## Abstract

The current study is an examination of the teacher–child relationships (closeness and conflict) as a predictor of children’s self-regulation in preschool, with a focus on child gender as moderator of associations between teacher–child relationships and children’s self-regulation. Participants were 291 low-income children (159 males; 37–70 months old) in the United States and 362 low-income children (165 males; 42–79 months) in Turkey, and their teachers. Teacher–child relationship was assessed via teacher-report and children’s self-regulation was assessed by independent researchers via structured tasks. Gender moderated the association between teacher–child conflict and self-regulation in children from the U.S. such that boys with lower levels of teacher–child conflict scored higher in self-regulation than boys who had higher levels of conflict with their teachers. Teacher–child conflict in the U.S. and teacher–child closeness in Turkey were significantly associated with children’s self-regulation. Limitations of the current study and future directions are also discussed.

**Keywords** Self-regulation · Turkish children · American children · Preschool children · Teacher–child relationship

## Introduction

Self-regulation is a multifaceted construct that includes emotion regulation, behavior regulation, and executive functioning/control (Kim and Kochanska 2012; McClelland and Cameron 2011). Self-regulation competencies are also considered to be foundational for children’s social and academic skills, which are essential components of their school

readiness (Blair 2002; McClelland and Cameron 2011). Acknowledging that self-regulation is a proximal predictor of various developmental outcomes, it has become a central point of inquiry among researchers in child development and early childhood education (Graziano et al. 2007; Kim and Kochanska 2012; McClelland and Cameron 2011).

Children develop self-regulation through interactions with their environment (Center on the Developing Child

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at Harvard University [CDC] 2014). As children enter preschool, they encounter more structured educational settings and activities, and this situation may lead them to have adaptation problems. Transition to school and early academic skills advantage children who acquire self-regulation, such as eliminating inappropriate thoughts and behaviors during structured activities (e.g., circle time), focusing on a task, following directions and controlling emotions (Best et al. 2011; McClelland et al. 2007). Within the context of classroom processes, teachers become important agents to help children regulate their behaviors and emotions (Baker 2006; Blair 2002; McClelland et al. 2007). From this point of view, qualities of teacher–child relationships are important for development of children’s self-regulation skills (Graziano et al. 2007; Shields et al. 2001). In addition, culture is another environmental factor that influences children’s development of self-regulation in early years (Boyer 2012; Wanless et al. 2013). Research across cultures comparing children’s self-regulation skills and how qualities of teacher–child relationships may affect their self-regulation skills has been lacking in the literature. Thus, in the current study, we attempted to examine how children’s self-regulation differs and how qualities of teacher–child relationships contribute to their self-regulation in the United States and Turkey. In addition, we examined whether child gender moderates the association between teacher–child relationship and self-regulation in the U.S. and Turkey.

From the points of the Sociocultural Theory (Vygotsky 1978) and Ecological Systems Theory (Bronfenbrenner and Morris 2006), children’s interactions with their immediate and distal environments affect their development. Each culture places different expectations and roles to parents and teachers to raise children within that cultural context (Kagitcibasi 2007). Although Turkish culture has gone through substantial changes in terms of social relationships from the collectivistic characteristics to mixed characteristics of individualism and collectivism, collectivistic characteristics are still valued within the culture, especially within low SES families (Kagitcibasi 2007). Considering that Turkish culture may possess both individualistic and collectivistic characteristics, we selected Turkish culture as a sample to examine the associations between teacher–child relationships and children’s self-regulation to compare against same associations with the U.S. culture, which is considered as individualistic cultural context (Kagitcibasi 2007).

### The Qualities of Teacher–Child Relationships and Children’s Self-Regulation

The quality of the teacher–child relationship influences child developmental outcomes—including social-emotional and cognitive skills (Hamre and Pianta 2001; Meehan et al. 2003). A positive teacher–child relationship may serve as

a protective factor and enable the young child to feel safe and secure in the classroom, providing opportunities for social and cognitive scaffolding (Hamre and Pianta 2001; Valiente et al. 2008). Moreover, children’s ability to form close, low-conflict relationships with teachers during the early years facilitates their adjustment to school which in turn influences academic outcomes (Birch and Ladd 1997; Hamre and Pianta 2001). Teacher–child closeness is characterized by the level of warmth and open communication present in the teacher–child relationship (Birch and Ladd 1997; Pianta 1999). Birch and Ladd (1997) examined the teacher–child relationship within a kindergarten sample and found teacher–child closeness was associated with children’s academic outcomes and the degree to which children liked school and were self-directed. Alternatively, teacher–child conflict was characterized by a level of disconnect between teacher and child, and discordant interactions (Birch and Ladd 1997). Conflictual teacher–child relationships may negatively influence children’s school success (Pianta 1999). Children’s stress and anxiety fostered by a conflictual teacher–child relationship may cause children to become disengaged in the classroom and/or promote negative school attitudes (Birch and Ladd 1997). Children who experience conflictual teacher–student relationships may experience impeded positive academic outcomes.

### Teacher–Child Closeness and Children’s Self-Regulation

Teacher–child relationships that are close and characterized by low levels of conflict can have enduring positive outcomes on children’s school success (Denham et al. 2012; Mashburn and Pianta 2006). Preschool children who experience relationships with their teachers that are warm and close tend to exhibit fewer behavioral problems, enjoy school more than their peers, and have better academic performance (Mashburn and Pianta 2006).

Studies have found that the quality of the relationship between teachers and the children in their classrooms is significantly associated with the social functioning and behavioral problems of preschool children (Graziano et al. 2007; Hamre and Pianta 2001; National Institute of Child Health and Human Development, Early Child Care Research Network [NICHD ECCRN] 2002). For example, in a study examining associations between measures of teacher–child interactions and instructional quality with the academic and social outcomes for children from low-income families in 11-state preschools within the United States (N=129), Burchinal et al. (2010) found that, for higher-quality classrooms, teacher–child interactions were a strong predictor of children’s lower levels of problem behavior and higher levels of social competence. In a nonwestern context, Leyva et al. (2015) found that children had higher gains in academic and cognitive inhibitory control when their classroom had higher

levels of classroom organization, emotional support, and instructional support. However, further research is needed to explore the influence of teacher–child relationship quality on preschool children’s self-regulation in nonwestern cultures.

### Teacher–Child Conflict and Children’s Self-Regulation

A conflicted teacher–child relationship is considered a risk factor for behavior problems and other unfavorable child outcomes (Hamre et al. 2008). Studies have shown that in a conflicted teacher–child relationship, a teacher tends to either react more negatively or indifferently toward the child, which could then result in the child developing more aggressive and disruptive behaviors in school (Birch and Ladd 1997; Myers and Morris 2009). This behavioral pattern may inadvertently reinforce maladaptive emotion regulation strategies (Skalická et al. 2015). Children with disharmonious interactions with their teachers also demonstrate poor self-regulatory capacities (Pianta 1999), low levels of effortful control, more externalizing behaviors (Morris et al. 2002), and have persistent academic and disciplinary problems (Hamre et al. 2008). Interestingly, Hamre et al. (2008) also found that the negative effects of teacher child–conflict on behavior problems are exacerbated when children have low levels of effortful control. This shows the importance and the potential buffering effect of self-regulation on other developmental risks.

A few non-Western studies did reveal some similar findings on relational conflict and self-regulation. For example, from a study in Tanzania, a collectivistic country that values obedience and has high regard for authority, teacher–child conflict played an influential role in children’s social behavior (Shavega et al. 2016). Research on a sample of Chinese students also suggested that a negative teacher–child relationship deterred functioning and socio-emotional development especially among children at risk (Guo et al. 2015).

### Interactions Between Child Gender and Teacher–Child Relationships

Existing research has shown that the teacher–child relationship differs for young boys and girls. A cross-sectional study of children from kindergarten to fourth grade showed that teachers consistently reported having more conflicts with boys and having more closeness with girls (Koepke and Harkins 2008). Correspondingly, boys also reported having more conflicts with their teacher, and girls, more closeness, in the same study. A few studies have also examined how child gender interacts with the quality of teacher–child relationships in affecting child outcomes, and there seems to be enough theoretical basis to support that the effects of teacher–child relationship are different for boys and girls (McCormick and O’Connor 2015). One perspective views

girls as more socially oriented; as such, close and high-quality relationship with their teachers are more beneficial for them. Alternatively, girls are also more negatively affected by conflicted relationships (McCormick and O’Connor 2015; Spilt et al. 2010). The qualities of the teacher–child relationships may be different with children depending on children’s gender; therefore, children could be affected differently by their relationships with teachers. From this perspective, we attempted to examine moderator effect of child gender for the association between teacher–child relationship and children’s self-regulation, postulating that teacher–child relationship may function differently for girls and boys.

### The Current Study

In this study, we examined the contributions of quality of teacher–child relationships (closeness and conflict) to children’s self-regulation in the U.S. and Turkey. We hypothesized that close teacher–child relationships would be positively and teacher–child conflict would be negatively associated with children’s self-regulation in both cultures. We also tested for the potential moderating role of child gender on the association between teacher–child relationship and children’s self-regulation. We tested a moderating model in which we hypothesized that girls and boys would be differently affected by teacher–child conflict and closeness as they develop self-regulation. As this study is first cross-cultural examination of the association between teacher–child relationship and children’s self-regulation in the U.S. and Turkey, we attempted to keep our hypotheses as exploratory.

We examined the following research questions:

Do low-income children in the U.S. display different levels of self-regulation than low-income children in Turkey? Does teacher–child relationship quality (closeness and conflict) differ between the U.S. and Turkish teachers? To what extent is teacher–child relationship quality associated with the self-regulation of children from low-income backgrounds in the U.S. and Turkey? To what extent does child gender moderate the association between teacher–child relationship quality and self-regulation in children from low-income backgrounds in the U.S. and Turkey?

## Methods

### Participants

In both countries, participants were recruited from disadvantaged districts and schools. The U.S. sample was recruited from three Educare Head Start programs serving children from low-income families in two Midwestern cities. The

Turkish sample from a disadvantaged district was recruited in a large-size city in central Turkey. All the Turkish schools in the current study were state-funded. We did not collect ethnicity and race information in Turkey because it is not a common and acceptable practice in research there.

### U.S. Sample

A total of 291 children (159 male) and their teachers were recruited for the current study. Child age ranged from 37 to 70 months old ( $M=53.88$  months,  $SD=6.43$ ). Of these children, 45.4% were Hispanic and 53.3% were non-Hispanic. Additionally, 21.6% of parents reported a non-high-school degree, 27.4% reported with high-school degree, and 51% reported as higher than high-school degree.

### Turkish Sample

A total of 362 children (165 male) and their teachers were recruited. Child age ranged from 42 to 79 months old ( $M=65.96$  months,  $SD=7.03$ ). Additionally, 48% of parents reported no high-school degree, 27.9% reported with high-school degree, and 24% reported higher than high-school degree.

## Measures

### Self-Regulation

Children's self-regulation skills were measured using several tasks from the Preschool Self-Regulation Assessment (PSRA; Smith-Donald et al. 2007). The PSRA has been validated both in the U.S. (Smith-Donald et al. 2007) and Turkey (Fındık Tanrıbuyurdu and Güler Yıldız 2014). Considering that self-regulation is a multifaceted construct, we used several tasks to capture different aspects of self-regulation. Tasks used in the current study were Balance Beam, Pencil Tap, Tower Task, Snack Delay, and Gift Wrap. These tasks tap executive/attention control and impulse/inhibitory control of children during the preschool years (Smith-Donald et al. 2007). Interrater reliability among raters was assessed using intraclass correlation (ICCs) (Shrout and Fleiss 1979). Average ICC across tasks was .75 for Turkish raters and .92 for the U.S. raters, indicating acceptable reliability among raters.

Balance Beam was scored as time in seconds at baseline and during two slow trials. Pencil Tap score was the percentage of correct responses out of 16 trials. The Tower Task was scored in a categorical manner (0 = no taking turns, 1 = partial taking turn, and 2 = full taking turn). For Snack Delay, a total mean score was computed that combined the first (snack) and second (hand placement) scores and consisted of the mean score from each trial (waiting + hand

score) across four trials. For Gift Wrap, all three scores from Gift Wrap (peeking scores, latency to looking over shoulder, and latency to turning around) were standardized and averaged to compute a total score for Gift Wrap with higher scores indicating better regulation (Carlson and Wang 2007). All scores from tasks were standardized and composited for a total score. (Smith-Donald et al. 2007). Confirmatory factor analyses (CFA) were run for each country to create composite self-regulation score with the tasks. The data fit very well for the U.S. [ $\chi^2(5)=5.92$ ,  $p=.31$ , Comparative Fit Index (CFI) = .99, Root Mean Square Error of Approximation (RMSEA) = .02, Standardized Root Mean Square Residual (SRMR) = .02]. For Turkish data, CFA also revealed acceptable model fit ( $\chi^2(5)=11.48$ ,  $p=.04$ , CFI = .94, RMSEA = .06, SRMR = .03). These fit indices were in the acceptable range (CFI > .90, SRMR < .06, RMSEA < .08; Browne and Cudeck 1992; MacCallum et al. 1996). Composite score of self-regulation was used in further analyses for both countries.

### Teacher–Child Relationships

In both counties, the Student–Teacher Relationship Scale (STRS; Pianta 2001) was used. The STRS assesses teachers' perceptions about their relationship with students via teacher-report. It has two subscales: closeness and conflict. We used the short form of the STRS in the U.S. with 15 items (8 items for closeness and 7 items for conflict). In Turkey, we used the conflict (12 items; e.g., “This child and I always seem to be struggling with each other”) and closeness (11 items; e.g., “I share an affectionate, warm relationship with this child”) subscales from 28-item long form of the STRS. Teachers rate each item on a 5-point scale (1 = “definitely does not apply” and 5 = “definitely applies”). The STRS has been validated with Turkish elementary school children (Beyazkurk and Kesner 2005; Koca 2010). Internal consistency for the U.S. (closeness  $\alpha=.85$ , conflict  $\alpha=.90$ ) and for the Turkey (closeness  $\alpha=.79$ , conflict  $\alpha=.82$ ) in the current study.

### Data Collection Procedures

Required ethical procedures were approved by the Ethics Committee of the University and the Ministry of National Education in Turkey. Teachers were asked to provide their consent for voluntary participation. Parents also were informed about the purpose of the study and signed a consent form for their voluntary participation. In the U.S., the University Institution Review Board (IRB) approached the procedures of the data collection. We also had a second IRB approval to protect participants' identities when cross-cultural data were shared. Data collection training procedures were standardized across the Turkish and

U.S. data collections. In both countries, each assessor was trained and supervised by an experienced assessor for the first several implementations. Following that, each task was conducted by an assessor and timed/scored by a second research assistant during the implementation. Each child was asked whether he/she wanted to play, if not, the child was not forced to play the games. For teacher–child relationships, teachers were given the STRS to fill out and return to research assistants in Turkey. In the U.S., teachers were visited during their meeting day when they filled out the STRS for each child in their classroom. If a teacher was missing at the meeting day, that teacher was given the STRS to return us later.

## Data Analytical Approach

Variables in the current study were tested for multivariate normality using skewness and kurtosis criteria. Accepted range for skewness is  $\pm 2$  and kurtosis is  $\pm 7$  (Curran et al. 1996). None of the variables were transformed or removed from the analyses because they all fell within suggested ranges of skewness and kurtosis. See Table 1 for detailed descriptive statistics. Teacher–child relationships (conflict and closeness) were centered at the sample mean (i.e., grand-mean centered) for main effect and interaction terms (Enders and Tofghi 2007). As children were nested within classrooms, we attempted to account for non-independence of observations of children in classrooms. However, unconditional models (i.e., empty model) revealed that there was not enough variance between levels (at classroom level). ICC for Turkey was .09 and .04 for the U.S. sample, indicating there was not enough variance between classrooms. As models did not recommend accounting for non-independence of observations, we did not include random intercept models in the analyses. Analyses were run using the *Mplus* and Full Information Maximum Likelihood used for handling missing data (Muthén and Muthén 2012). Simple slope analysis followed the moderation models to explore significant interactions effects. We employed models with different covariates depending on the country. For example, we had an ethnicity variable available in the U.S. but not in Turkey; thus, we

used ethnicity (Hispanic and Non-Hispanic) as covariates in the models for the U.S., as it has been shown be related to children’s self-regulation (Caughy et al. 2013; Guirguis 2015). Also, note that parent age was not included in the models for the U.S. sample as it was not bivariately correlated with children’s self-regulation skills ( $r = .03, p = .64$ ); However, it was included in models with Turkish sample as it was correlated with Turkish children’s self-regulation ( $r = -.13, p = .02$ ).

## Results

### Preliminary Findings

See Table 2 for correlation among study variables in two cultures. Preliminary analyses were conducted to examine cross-cultural differences as well gender differences within culture of self-regulation, and teacher–child relationships. For the U.S. sample, girls ( $M = .13, SD = .62$ ) scored higher on self-regulation than boys did ( $M = -.12, SD = .71$ ), ( $t(213) = -2.83, p < .01, d = -.37$ ). There was no significant difference between genders on self-regulation in the Turkish sample ( $t(345) = -.95, p = .34$ ). Within the Turkish sample, girls ( $M = 3.75, SD = .62$ ) scored higher on teacher–child closeness than boys did ( $M = 3.52, SD = .64$ ), ( $t(283) = -3.14, p < .01, d = -.36$ ). There was no gender difference on teacher–child conflict for Turkish sample ( $t(283) = .98, p = .98$ ). Within the U.S. sample, girls ( $M = 4.19, SD = .53$ ) scored higher on teacher–child closeness than boys did ( $M = 3.85, SD = .71$ ), ( $t(283) = -4.45, p < .001, d = -.54$ ). As parallel, boys ( $M = 2.18, SD = .94$ ) scored higher on teacher–child conflict than girls did in the U.S. sample ( $M = 1.77, SD = .79$ ), ( $t(283) = 3.95, p < .001, d = .47$ ). For both U.S. and Turkish samples, children’s self-regulation did not differ depending upon caregiver education level  $F(2,225) = .12, p = .88$  and  $F(2,201) = .01, p = .99$ , respectively. In both the U.S. and Turkey, children’s age was positively correlated with their self-regulation,  $r(252) = .40, p < .001$  and  $r(347) = .34, p < .001$ , respectively.

**Table 1** Descriptive statistics of the study variables

Variable	U.S. sample			Turkish sample		
	Teacher closeness	Teacher conflict	Self-regulation	Teacher closeness	Teacher conflict	Self-regulation
<i>M</i>	4.01	1.99	.004	3.63	1.81	.001
<i>SD</i>	.65	.90	.66	.63	.59	.56
Min	1.57	1.00	-2.02	1.72	1.00	-2.01
Max	5.00	4.87	.89	4.81	4.33	2.10
Skewness	-.87	.92	-.84	-.63	.83	-1.21
Kurtosis	.47	.01	.07	.11	.89	1.53

**Table 2** Correlations among study variables for the U.S. and Turkey

Variable	1	2	3	4	5	6	7
1. Self-regulation	–	.12	.03	.05	.34**	–.13*	
2. Teacher–child close	.16*	–	–.23**	.18**	–.06	.01	
3. Teacher–child conflict	–.19*	–.29**	–	.01	.09	–.02	
4. Child gender	.24*	.26**	–.23**	–	–.02	.02	
5. Child age	.40**	.09	.02	.04	–	–.06	
6. Caregiver age	.03	–.19**	–.05	–.06	.12	–	
7. Ethnicity	–.17**	–.08	.15*	–.03	–.01	–.01	–

Child gender was dummy-coded (0 = male; 1 = female). Ethnicity was not available in Turkish data. Below the diagonal shows correlations for US; above the diagonal shows correlations for Turkey

\* $p < .05$ ; \*\* $p < .01$

Next, we examined cross-cultural differences in children's self-regulation and their relationships with teachers. There was no significant difference between the U.S. ( $M = .004$ ,  $SD = .66$ ) and Turkey ( $M = .001$ ,  $SD = .56$ ) on children's self-regulation,  $t(362) = .07$ ,  $p > .05$ . There was a significant difference of teacher–child conflict between the U.S. ( $M = 1.99$ ,  $SD = .90$ ) and Turkey ( $M = 1.81$ ,  $SD = .59$ ),  $t(285) = 2.81$ ,  $p < .01$ ,  $d = .24$ .

### Teacher–Child Relationships and Children's Self-Regulation in the U.S.

First, we ran a main-effects only model to warrant examining how qualities of teacher–child relationship are associated with children's self-regulation. In the main-effects only models, there was no interaction term. The results from the main-effect only model revealed that teacher–child conflict was significantly associated with children's self-regulation ( $\beta = -.09$ ,  $t = -2.06$ ,  $p < .05$ ). Thus, for every one-unit increase in teacher–child conflict, children's self-regulation decreased by .09 unit (See Table 3). There was no significant main effect of teacher–child closeness ( $\beta = .05$ ,  $t = 1.31$ ,  $p > .05$ ).

In the interaction model, teacher–child relationships and gender (i.e., gender  $\times$  teacher–child closeness and gender  $\times$  teacher–child conflict) were added to the main-effect only model predicting children's self-regulation. Gender did not significantly moderate the association between teacher–child closeness and self-regulation ( $\beta = -.03$ ,  $t = -0.30$ ,  $p > .05$ ). However, gender moderated the association between teacher–child conflict and self-regulation ( $\beta = -.20$ ,  $t = -2.23$ ,  $p < .05$ ). To understanding the nature of interaction, simple slopes analysis was run for boys and girls as moderators. Simple slopes analysis showed that slope for girls was not significantly different from zero ( $t = 0.53$ ,  $p = .59$ ). However, slope for boys was significantly different from zero ( $t = -2.92$ ,  $p = .003$ ), such that when boys had lower levels of teacher–child conflict, they had higher levels of self-regulation as compared to boys with higher levels of

**Table 3** Final model parameters for main effects and moderation models for self-regulation by teacher–child relationships in the U.S.

	Self-regulation			
	Main effect only		Interaction	
	Estimate (SE)	<i>t</i> -stats	Estimate (SE)	<i>t</i> -stats
Intercept	–0.01 (.07)	–0.07	0.02 (.07)	0.36
Gender (male)	–0.18 (.08)*	–2.27	–0.21 (.08)*	–2.54
Age	0.27 (.03)**	7.06	0.27 (.03)**	7.28
PE (above HS)				
No HS	–0.16 (.10)	–1.56	–0.17 (.10)	–1.64
HS	–0.03 (.09)	–0.36	–0.03 (.09)	–0.37
Ethnicity (non-Hispanic)	0.24 (.08)**	2.85	0.24 (.08)**	2.88
Teacher–child relationship				
Closeness	0.05 (.04)	1.31	0.07 (.07)	1.03
Conflict	–0.09 (.04)*	–2.06	0.04 (.07)	0.59
Interaction				
Closeness $\times$ gender			–0.03 (.09)	–0.30
Conflict $\times$ gender			–0.20 (.09)*	–2.23

Reference groups are showed in parenthesis

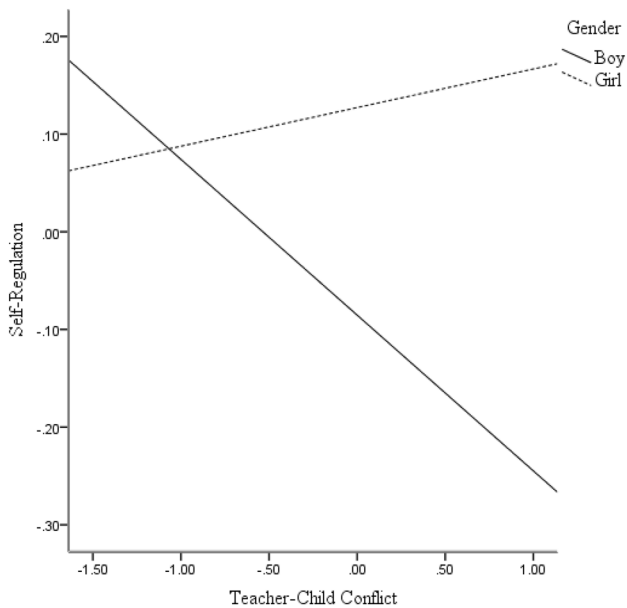
PE parent education, HS high school

\* $p < .05$ ; \*\* $p < .01$

teacher–child conflict. See Fig. 1 for the interaction plot. For covariate effects, girls had significantly higher scores than boys did on self-regulation ( $t = -2.54$ ,  $p = .01$ ). As children got older, they scored higher on self-regulation ( $t = 7.28$ ,  $p < .001$ ).

### Teacher–Child Relationships and Children's Self-Regulation in Turkey

The results from the main-effect only model revealed that teacher–child closeness was significantly associated with children's self-regulation ( $\beta = .11$ ,  $t = 2.06$ ,  $p < .05$ ). Thus, for every one-unit increase in teacher–child closeness, children's self-regulation increased by .11 unit (see Table 4).



**Fig. 1** Teacher–child conflict and gender predicting children’s self-regulation in the U.S. sample

**Table 4** Final model parameters for main effects and moderation models for self-regulation by teacher–child relationships in Turkey

	Self-regulation			
	Main effects only		Interaction	
	Estimate (SE)	<i>t</i> -stats	Estimate (SE)	<i>t</i> -stats
Intercept	−0.07 (.11)	−0.60	−0.06 (.11)	−0.54
Gender (female)	−0.09 (.09)	−0.93	−0.10 (.10)	−1.07
Age	0.18 (.05)**	3.27	0.19 (.05)**	3.36
PE (above HS)				
No HS	0.08 (.13)	0.61	0.10 (.13)	0.78
HS	0.08 (.15)	0.56	0.08 (.14)	0.55
Parent age	−0.14 (.05)**	−2.70	−0.13 (.05)*	−2.51
Teacher–child relationship				
Closeness	0.11 (.05)*	2.06	0.01 (.07)	0.12
Conflict	0.03 (.05)	0.66	−0.02 (.07)	−0.24
Interaction				
Closeness × gender			0.18 (.10)	1.81
Conflict × gender			0.08 (.11)	0.81

Reference groups are showed in parenthesis

PE parent education, HS high school

\**p* < .05; \*\**p* < .01

There was no significant main effect of teacher–child conflict on children’s self-regulation ( $\beta = .03, t = 0.66, p > .05$ ).

In the interaction model, gender did not significantly moderate the association between teacher–child closeness and self-regulation ( $\beta = .18, t = 1.81, p > .05$ ) and teacher–child conflict and self-regulation ( $\beta = .08, t = 0.81,$

$p > .05$ ). As children got older, they scored higher on self-regulation ( $t = 3.36, p < .01$ ). Children whose parents were younger scored higher on self-regulation ( $t = -2.51, p < .05$ ). See Table 4.

### Discussion

In the current study, we examined the contributions of quality of teacher–child relationships (closeness and conflict) to low-income preschool children’s self-regulation in the U.S. and Turkey. We found several interesting findings worth discussing. Each finding is discussed in turn below.

First, we found a moderating role of gender between the association for teacher–child conflict and children’s self-regulation in the U.S. Our findings on the moderating effect of gender in the U.S. sample corroborate existing literature which shows that gender and teacher–child relationship interact to influence the development of self-regulation. Our results point to the negative impact of teacher–child conflict, especially for boys, such that boys with lower levels of teacher–child conflict scored higher in self-regulation than boys who had higher levels of conflict with their teacher. The results imply that boys may have poorer self-regulatory capacities across the quality of their relationship with their teachers, and this is consistent with existing research showing that girls score higher compared to boys across different contexts (Wanless et al. 2013; Magat 2013) and that boys show low levels of behavior regulation in the presence of poor relationship qualities (Turner 1991). We offer two explanations for this finding. First, our measure of self-regulation mainly focused on children’s attention, ability to concentrate and delay gratification, and self-control. Boys have been found to score low on these tasks (i.e., school-appropriate behaviors) (Ewing and Taylor 2009) and it is plausible that their low scores are further exacerbated by the level of conflict they experience from their teachers. Second, the girls in the U.S. sample scored significantly higher on self-regulation and scored lower on teacher–child conflict compared to boys. Given these scores, it is possible that gender did not have to moderate or limit the negative influence of teacher–child conflict on girls’ self-regulation. In this case, the moderating effect of gender for girls was not readily observed. However, the lack of a moderating effect should not be misinterpreted to denote that teacher–child conflict does not affect girls’ self-regulation.

A second finding was that teacher–child conflict was significantly associated with children’s self-regulation for the U.S. sample. This is consistent with previous research with the U.S. children (Berry 2012; Portilla et al. 2014) showing that children’s conflictual relationships with their teachers were associated with their levels of self-regulation. In addition, we found that teacher–child closeness was significantly

associated with children's self-regulation in the Turkish sample. This result of our study was similar to the previous study conducted with socially disadvantaged preschool children in Portugal. Cadima et al. (2016) found that socially disadvantaged preschool children showed larger improvements in their observed self-regulation skills when they had closer relationships with their teachers. As it is seen in our study and previous studies, the quality of the relationship with their teachers is related to children's self-regulation skills. Although the question remains of why teacher–child conflict in the U.S. and closeness in Turkey was related to children's self-regulation, it appears too that the higher closeness and lower conflict with teacher can be beneficial for children's self-regulation. This may be because the supportive nature of positive relationships or absence of negative relationships in classrooms provides tools (e.g., supporting expression of behaviors) that help children to practice their self-regulation skills (Cadima et al. 2016; Pianta 1999).

A third finding from the current study was that girls had significantly higher scores on self-regulation than boys. This is consistent with the broader research literature findings showing that, throughout development, girls tend to demonstrate better self-regulation than boys (Li-Grinning 2007; Matthews et al. 2009). These findings range across methodologies, with differences found in teacher reports and objective measures (Matthews et al. 2009). However, growth in self-regulation skills progresses similarly for children of both genders (Raikes et al. 2007).

### Limitations and Future Directions

Although this study employed a cross-cultural perspective on how the quality of teacher–child relationship related to low-income children's self-regulation in the U.S. and Turkey, some limitations should be mentioned. First, ratings of teacher–child relationships were based on teacher self-report; as such they may reflect characteristics and bias of raters in each culture. Future research should employ observations of teacher–child relationships to provide more information and inhibit raters' bias. Second, we used all measures in two different cultural contexts. Although measures have been validated in both cultures, there is always a chance of mistranslation of one concept from one cultural context to another context (He and van de Vijver 2012). Future studies may employ a multi-method methodology with different sampling procedures to include diverse and representative samples for each culture. Another suggestion for future research is to utilize mixed-methods research to qualitatively capture within-culture and between-cultural aspects of teachers' perception of their relationships with children.

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### Compliance with Ethical Standards

**Conflict of interest** The authors declare that they have no conflict of interest.

**Ethical Approval** All procedures performed in this study involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

**Informed Consent** Informed consent was obtained from all individual participants included in the study.

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