



TEACHER-CHILD RELATIONSHIPS AND CHILDREN'S LITERACY IN KINDERGARTEN AND PRIMARY SCHOOL: A LITERATURE REVIEW

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Abstract:

Teacher-child relationship remains a topic of great interest, as it is known that affects substantially children's personal and social well-being. Various research efforts have been done in order to examine the interaction between teacher and students, and how the quality of this interaction affects the developmental process of the child. Existing data demonstrate the important role of a supporting school environment on child's academic skills improvement, especially with regard to language and literacy and mathematics. High-quality teacher-child relationships were closely associated with improved academic performance, and children were motivated to participate in learning processes. On the other hand, conflictual teacher-child relationships could lead to lower levels of academic skills and in some cases with behavior problems. This article aims to review the current literature on this topic, focusing on the role of teacher-child relationship on affecting child's literacy skills. Finally, we discuss the results of the studies, highlighting further gaps in existing evidence and proposing futures perspectives in research.

Keywords: teacher-child relationships, children's literacy, children's academic achievement, kindergarten, primary school

1. Introduction

Though many milestones have been achieved in education and learning methods, teacher-child relationships remains a subject of intensive research. Various efforts have been made in the past, in order to better understand the role of this relationship, as well as to evaluate factors points that positively or negatively affect this relationship (e.g. Gregoriadis & Grammatikopoulos, 2014).

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According to attachment theory, children from a very young age are needed to cultivate a relationship with at least one primary caregiver in order to successfully develop social and emotional skills. Thus, children learn to control their feelings with the most appropriate manner and develop a socially acceptable behavior. Nowadays, many investigators exploit the general principles of attachment theory as a method to better examine teacher-child relationship in the school environment (Pianta, Hamre, & Stuhlman, 2003).

In the context of attachment theory, many studies connect emotional security with children's readiness to explore the unknown school environment and also with their attention in learning activities (Pianta, 1999; Pianta, Nimetz, & Bennett, 1997). Teacher-child relationship plays also vital role in the development of children's literacy. Relationships characterized by closeness with teachers could also exert positive effects on academic and socio-emotional functioning among children who are at higher behavioral risk. It has been indicated that a solid relationship with teachers could soften the negative effects of children's earlier experiences, such as a parental rejection or low family income. In oppose to this, a conflictual relationship has been associated with negative academic performance for children who face externalizing and internalizing problems (Sabol, 2012).

In our article, we will review our current knowledge on teacher-child relationship and how this relationship can affect children's literacy. We will critically review previous studies investigating this subject, and we will describe previous and recent methods that could positively affect this relationship, as well as children's literacy.

2. Teacher-child relationships

Teacher-child relationships have been defined from various theoretical backgrounds (e.g. symbolic interactionism, attachment theory). The last years, a relatively common approach analyses teacher-child relationships under the scope of three dimensions, Closeness, Conflict (Pianta, 1992) and Dependency among teacher and child (Pianta, 2001). The degree of positive interactions, the bidirectional eagerness for open communication and the quality of feelings between children and teachers, could define teacher- child closeness (Mashburn & Pianta, 2006). On the other hand, teacher-child conflict is the opposite aspect of the teacher-child closeness, accompanied by negative feelings, like anger and frustration and is characterized by the lack of positive interpersonal associations between the subjects (Mashburn & Pianta, 2006). Children, who experience close relationships with their kindergarten teachers, have been shown that develop better cognitive skills in language and math, from the very early stages at kindergarten through primary grades (Peisner-Feinberg, 1999). Moreover, high quality relationships with their teacher could help children feel more safe as they are exposed to extremely stressful situations, as it is the competitive environment of a school class, especially in cases of ethnic minorities (Gregoriadis, Tsigilis, Grammatikopoulos, & Kouli, 2016; Meehan, Hughes, & Cavell, 2003; Murray & Greenberg, 2001). Murray

(2009) in his study conducted among low-income urban students, describes that children who experience a warm relationship with their teachers in the early school years develop better social skills and tend to show fewer behavioral problems. On the contrary, kindergarten children who have a conflict relationship with their teachers are more likely to exhibit a socially non acceptable behavior, while it is less possible to overcome their behavioral deficit in their future life (Ewing & Taylor, 2009). Additionally, kindergarten teachers who are more emotionally engaged with children who face behavioral problems are more possible to construct positive relationships with them (Buyse, Verschueren, Doumen, Van Damme, & Maes, 2008).

Multiple factors can contribute to the quality of teacher-child relationships and can influence children's future academic and social trajectory. A factor that seems to play important role is the income of the student's family. It has been demonstrated that children with low income and racial differences tend to be at higher risk for low-quality relationships with their teacher than children with higher income (Hamre & Pianta, 2001; Hill et al., 2004). There is a large body of literature indicating that teacher-child common ethnicity is associated with more positive teacher evaluation of closeness (Saft & Pianta, 2001). In support of this observation, several early reports also demonstrated that these early racial and income disparities may result in different achievement levels (Pianta, Rimm-Kauffman, & Cox, 1999). It should be mentioned that in many of these studies the assessment of teacher-child relationship was only based on teacher's perception, which could partly affect the perception on the quality of the relationship. Moreover, an externalizing and internalizing behavior problem can lead to a low-quality teacher-child relationship during the first school years and in middle childhood (Henricsson & Rydell, 2004; Howes, 2000). Moreover, there are data indicating that maternal educational level could lead children to an externalizing and internalizing behavior problem. To be more specific, children whose mothers do not have a complete education are more prone to perform higher levels of externalizing and internalizing behavior problems than their peers (Keiley, Lofthouse, Bates, Dodge, & Pettit, 2003; Nagin & Tremblay, 2001; Pianta & Stuhlman, 2004). In addition, behavior problems in childhood are possible to continue to exist during their adult life, having personal and social consequences, as they are closely linked to academic failure, unemployment, emotional problems and criminality (Foster, Dodge, & Jones, 2003; Nock & Kazdin, 2002; Roza, Hofstra, van der Ende, & Verhulst, 2003). Factors like gender and early behavior problems are also associated with subsequent behavior problems during the elementary school years and could have significant impact on teacher-child relationships. Furthermore, data showed that teachers develop a closer and less conflictual relationships with girls than with boys (Baker, 2006; Hamre & Pianta, 2001; Silver, Measelle, Armstrong & Essex, 2005) and is more possible for girls to develop a dependent relationship with their teachers (Howes, Phillipsen, & Peisner-Feinberg, 2000). Due to stronger emotional attachment that girls develop with their teachers, girls are more likely to benefit from socialization efforts of their teachers and as a result to demonstrate a more acceptable behavior in the classroom. On the other hand, boys tend to have a more conflictual relationship with their teacher. However, this seems to have

no negative impact on their individual and social development, unless this conflict is not associated with aggression and dominance. With regard to teacher-child dependency, it is believed that boys are more prone to display behavioral problems than girls, because dependency is not in absolute accordance with their male nature (Basow, 2004).

2.1 Child's achievement

According to developmental psychology, there is a close association between parent-child supportive relationships, especially with mothers, and children's achievement. However, over the past years, research efforts focused on teacher-child relationships, which have been recognized that are of equal importance for children's achievement (Pianta, 1999). Children who have developed a close relationship with their teachers are more possible to achieve better than children whose relationships are characterized by lower quality (Furrer & Skinner, 2003; Pianta & Stuhlman, 2004). Moreover, feelings that school provokes to children, can affect children's academic success. Thus, children who have a positive perception of school are more eager to participate in classroom activities than children who have a negative perception. In addition, children with a more positive perception try harder in order to succeed and they have a strong self-esteem for learning activities (Ladd, Birch and Bush 1999; Mashburn et al. 2006).

It is well understood, that changes in the quality of teacher-child relationships affect children's achievement. In the study of Hamre and Pianta (2001) has been indicated that the worsening of kindergarten teacher-child relationship is associated with worsening of academic performance, while children with more negative relationships tend to continuously have lower achievement levels through elementary school independently of gender, ethnicity or verbal IQ (Hamre & Pianta, 2001).

2.2 Literacy

The traditional definition of literacy is the ability to [read](#) and [write](#). A more detailed definition from The United Nations Educational, Scientific and Cultural Organization ([UNESCO](#)), defines literacy as *"the ability to identify, understand, interpret, create, communicate and compute, using printed and written materials associated with varying contexts. Literacy involves a continuum of learning in enabling individuals to achieve their goals, to develop their knowledge and potential, and to participate fully in their community and wider society"*. Though it may sound quite straightforward process, reading development usually prerequisites a number of complex language skills, such as the awareness of speech sounds, the meaning of the words or sounds, the pattern of word formation, as well as spelling and grammar patterns. A harmonic combination of the aforementioned skills could lead to an evolving reading and writing development, including reading fluency and comprehension, which are important aspects of literacy.

It is widely known that there is a strong connection between the growth of mathematics and reading ability. There is a number of current studies focusing on defining potent factors that can predict children's achievement in these two domains. However, it should be noted that in most of these, study population consists of

elementary-school children (Koponen et al., [2013](#); Fuchs et al., [2016](#)). Numerous studies have indicated that teachers who have a more qualitative communication with children and expose them in a more compelling language environment help them to develop literacy skills that are associated with later achievement in reading (Dickinson & Caswell, 2007; Wasik, Bond, & Hindman, 2006). A school environment cultivating positive reinforcement, could lead to the development of literacy skills, especially for this group of children who are less likely to receive parental or social support in their first school year because of the lack of suitable supporting social environment (Neuman, 2009). Melby-Lervåg et al (2012), measured children's phonological skills and their ability in reading activities. The results of this study showed that there is a significant association between children's phonological knowledge and later reading success. Specifically, they separate the ability to name a letter, which significantly helps child's reading development, from phonological awareness and processing. Thus, children acquiring the knowledge to name letters become able to match the sound of the pronounced letter with the equivocal written symbol. According Duncan et. al (2007) the development of numeracy system is a factor with a dominant role in predicting children's later achievement in primary school.

The role of teacher in children's literacy and in involvement in learning activities is of great essence for children's later academic and social trajectory. Several studies focusing on literacy in kindergarten indicated that there are gender differences in the execution of preliminary literacy activities. Thus, many researchers have proved that girls perform better than boys in precursor activities (Chatterji, 2006; Ready, LoGerfo, Burkam, & Lee, 2005). Camarata & Woodcock (2006) demonstrated that males showed lower levels of achievement on tests which examined the speed of reading and writing, as opposed to females. Moreover, the gender of kindergarten teacher is a factor which affects boys' participation in learning activities. Female kindergarten teachers tend to choose activities oriented to girls and avoid to choose activities oriented to male nature. This may lead boys not to take part in these activities because of their lack of interest (Martin & Ruble, 2010). Regarding teacher's relationships with girls, previous research demonstrated that female teachers mention that they experience closer relationships with girls compared to boys (Gregoriadis & Tsigilis, 2008; Pianta, 2001), and girls tend to develop more often secure relationships with a nonparental caregiver like teacher (Ahnert, Piquart, & Lamb, 2006).

2.2.1 Literature review process

In order to review the literature regarding teacher-child relationships and children's literacy, a systematic search of recent literature has been done. The key words used in two main databases (Google Scholar and Scopus) in order to find respective literature were "teacher-child relationships" and "children's literacy" or alternatively "children's academic achievement" or "children's reading achievement" or "children's writing achievement" or "children's mathematic achievement". In order to be more efficient, inclusion and exclusion criteria have been prespecified. Articles that were found in the initial results were primarily evaluated based on the title and the abstract of the article.

Articles that fulfilled our criteria were subjected to a thorough analysis and investigation. Specifically, in our current project 22 studies, published between 2010 and 2017 studying teacher-child relationships and its effect on children's literacy, were included. The age of the participant children was also well-defined, including children attending kindergarten or primary school. There were studies that followed participated children, starting from their kindergarten time throughout first grades of the primary school. Studies relevant to the topic of our project and examined older children were excluded from our research. However, we included in our research long-term studies that examined children at pre- kindergarten age and followed them during their kindergarten or elementary school time. It is important to mention, that in almost all studies, participated children shared some common characteristics i.e. they were from low-income background, or they belonged to a diverse ethnicity group, or they were at high risk to develop a conflictual teacher-child relationship or have low academic performance.

2.2.2 The role of teacher-child relationships in child literacy

Numerous studies tried to investigate how teacher-child relationships could influence child's learning outcomes. In one of the most interesting studies, McCormick et al. (2013) examined the effect of high quality teacher-child relationship on math and reading achievement in kindergarten children through their transition in first grade. This study included 324 low-income, black and Hispanic students and 112 kindergarten and first-grade teachers. One of the most innovative aspects of this study is that exploited multilevel propensity score methods in combination with multilevel regression models. The researchers in order to collect information for the learning, emotional and behavior profile of participants used a variety of tools such as the teacher-reported Student- Teacher Relationship Scale (STRS) to evaluate teacher's feelings and beliefs about the student's actions toward him/her, the Letter- Word Identification and Applied Problems subtests of the Woodcock- Johnson III Tests of Achievement, Form B(WJ III) to assess reading and math achievement, Family Involvement Questionnaire for Elementary School (FIQ-E), Sutter Eyberg Student Behavior Inventory for measuring behavior problems, child sustained attention assessed using the Attention Sustained subtest from the Leiter International Performance Scale- Revised ,child academic competence measured with subscales of the Academic Competency Evaluation Scale. The analysis of the collected dataset indicated that high-quality teacher-child relationship in kindergarten affect children's performance on math in first grade. On the other hand, the effect was not statistically significant in reading achievement. The results of the current study are in accordance with previous research findings demonstrating that math accomplishment in first grades of school can strongly predict later academic achievement (Duncan et. al, 2007).

Recent studies tried to evaluate the contribution of teacher-child relationship in children's writing ability. White (2013) in his study examined the associations between the quality of teacher-child relationship and children's ability to write in kindergarten and first grade. In this study participated a total of 20 teachers, 8 teachers from

kindergarten and 12 teachers from first grade, as well as 127 students (65 kindergarten students and 62 first graders). The Student Teacher Relationship Scale (STRS) was used to evaluate the degree of closeness and conflict between teacher and child according teacher's report, feelings about teachers were assessed with the scale "The Feelings About School" (FAS) and the receptive vocabulary was assessed with the Peabody Picture Vocabulary Test (PPVT). The results of this study highlighted the vital role of a qualitative teacher-child relationship in children's learning and specifically in writing. To be more specific, children who experience a conflictual relationship with their teachers tend to have lower writing scores. On the contrary, a close relationship between teacher and child seemed not to affect children's writing performance, but was associated with higher receptive language scores. Another interesting finding of the current study was that have not been detected associations among children's feelings about teachers and their writing outcome. Moreover, gender was not a factor that could affect children's writing outcome or contribute to the closeness and conflict. It is important to mention, that this study is the first known study which associated children's writing performance with a conflictual teacher-child relationship, while the majority of previous studies focused on associations between teacher-child conflict relationship and reading ability.

Another interesting research was conducted by Hughes and Kwok (2007). Among others, this research was referred to how a high quality teacher-child relationship can affect student's achievement in primary grades and especially was focused on students who characterized by low levels of achievement. In the study participated 443 students, ethnically diverse (African American, Hispanic and Caucasian), 1st-grade, who attending 1 of 3 school districts in Texas. For academic achievement researchers used the WJ-III Broad Reading W scores (Letter-Word Identification, Reading Fluency, Passage Comprehension subtests) and the WJ-III Broad Mathematics W scores (Calculations, Math Fluency, and Math Calculation Skills subtests). In the case that children or their parents spoke Spanish, children's reading ability were measured by the Woodcock-Muñoz Language Survey, so as to be evaluated child's language proficiency in English and Spanish and selection of either the WJ-III or the Bateria-R. child engagement was measured by a teacher-report from the Conscientious scale of the Big Five Inventory of John & Srivastava (1999) and from the Social Competence Scale. Teacher perception of student-teacher support was assessed with Teacher Relationship Inventory (TRI). A Likert-type scale was used for teachers to indicate the level of support or conflict in their relationships with children. Children, on the other hand, used a modified version of Class Play, as well as a roster rating of liking for classmates, in order to indicate quantitatively an evaluation of the provision of teacher support to children. Results indicate that African American children are less likely to develop a close relationship with their teachers, which could affect children's achievement. In an effort to explain the low quality of teacher-child relationship of African American students, researchers reported some possible reasons.

First of all, African American children in first grades have the tendency to display more behavioral problems, such as exhibiting an aggressive behavior when

compared to Caucasian and Hispanic children. This observation in African American children's behavior may result in an insufficient motivation for learning, which could have negative consequences for teachers-child interactions. Moreover, a different parental approach or differences in communication strategy and beliefs about learning that might accompany teachers and African American parents are potential predictors for low quality teacher relationship with African American students. Furthermore, teacher's behavior may include ethnic or racial elements which could affect their emotional attitude toward children. Overall, the findings of this study demonstrated that children's social experiences in school environment during first years could provoke significant racial disparities, which is likely to affect the academic performance.

Liew et al. (2010) examined how children's effortful control (i.e. inhibitory control and task accuracy) and a supportive teacher-student relationship at first grade affect reading and mathematics achievement at second grade. Participants were drawn from a sample of 784 first-grade children who participated in a longitudinal, prospective study examining the impact of grade retention on academic achievement in academically at-risk children. In the present study, a total of 761 children met the criteria to participate with many of them belonging to low-income families and having different ethnic identity, also assessed to be academically at higher risk. For the assessment of effortful control four tasks from a behavioral battery, designed to assess effortful control, were administered individually to each participant. For the evaluation of teacher-student relationship, teachers completed a Teacher Student Relationship Inventory (TSRI) questionnaire and children's academic achievement was assessed with the WJ-III Achievement Battery. Among participants there were 73 children who had Spanish as maternal language. In this case, evaluation was based on their performance on the Woodcock-Muñoz Language Proficiency Test. Children's cognitive ability (IQ) was individually assessed in school at first grade with the Universal Nonverbal Intelligence Test (UNIT). In addition, coefficients like inhibitory control, task accuracy, economic adversity, ethnicity, sex and age were considered. The results of this study indicated that children's sociodemographic variables such as high IQ, female sex, family's high income, and non-African American status were closely related with reading or mathematics achievement. Another interesting finding of the current study showed that age was negatively associated with reading and mathematics achievement. Thus, children who were older for their actual grade, have the tendency to demonstrate poor performance in learning activities in comparison with children of the same age, but not necessarily in comparison with their classmates. Moreover, children who face self-regulation problems (like low task accuracy) seemed to benefit more from a high quality relationship with their teacher. Specifically, children with high task accuracy manage to achieve better at school either they interact with a supportive teacher or not. On the other hand, children who demonstrate low task accuracy but have a close relationship with their teacher, perform alike with high task accuracy children. In addition, according to results analysis there was a modification in continuity in first and second Waves in reading and in mathematics achievement one year later. Concerning

inhibitory control and warm teacher–student interaction, findings demonstrated that there was a positive association with reading and mathematics achievement one year later. In conclusion, the present study contributes to the existing research by focusing on the reciprocal and supportive effects of effortful control and high quality teacher–student relationships on children's achievement.

Maldonado-Carreño et al. (2011) examined the between- and within-child associations between teacher–child relationship quality and children's academic achievement, as well as behavior problems from kindergarten through 5th grade. The initial purpose of this study was to clarify whether children's dissimilarity in academic achievement and behavior problems are related with teacher–child relationship quality in primary school. Secondly, this study aimed to demonstrate the extent to which the significant contribution of teacher–child relationship quality continuous to exist with children's transition to primary school. Primary source of the study data was the National Institute of Child Health and Human Development Study of Early Child Care and Youth Development (NICHD) and especially from the second and third phases of the NICHD study. Various rating tools have been used in this study, while research was conducted by field interviewers and was also based on teacher reports. The Woodcock–Johnson Psycho-Educational Battery (WJ–R) was used to assess reading and math achievement (1st, 3rd and 5th grade), beyond the yearly teacher report of academic skills obtained from the Academic Rating Scale from the Early Childhood Longitudinal Study. Teachers' report on children's academic skills was focused on two areas i.e. language-literacy and mathematics. In order to assess children's behavior problems, reports were taken from both the mother and the teacher of the child. The Child Behavior Checklist (CBCL) was completed by mothers in kindergarten, first, third, fourth, and fifth grades, whereas teachers completed yearly the Teacher Report Form (TRF). As in previous studies, the Student Teacher Relationship Scale (STRS) was used to assess teacher-child relationship. This is considered the first study, which tried to examine both between-child and within-child associations with the quality of teacher-child relationship, while also investigated how these observations could change throughout elementary school years. The findings of this study demonstrated that the quality of teacher-child relationship, which based on teachers report, was linked with children's level of achievement from kindergarten throughout fifth grade. Specifically, teachers who reported a positive relationship with their students rated these children with higher scores in language and literacy and mathematics. However, it should be mentioned, that if the average relationship quality was taken into account, as it is reported from different teachers throughout school life, there was no significant association with the observed improvements in academic skills. Of great interest, within-child positive changes in relationship quality, was importantly linked to improvements in academic skills, especially with regard to language and literacy, as well as mathematics. The findings of the present study contribute to the existing literacy underling the significant role of teacher-child relationship quality in children's academic achievement.

O'Connor et al. (2007) examined how the quality of teacher-child relationship could affect children's achievement in third grade. The population of the study consisted of 880 children who had completed the 36-month modified Strange Situation and remained in the study until their transition to third grade. Data derived from the initial of the three phases of the National Institute of Child Health and Human Development Study of Early Care and Education, a study of 1,364 children who were followed from birth through sixth grade. This study had three main findings: firstly, that there was a close association between the quality of teacher-child relationship and children's academic achievement. Secondly, a positive relationship among teacher and child can protect child from previous negative experiences of insecurity or other emotional obstacles that could affect children's achievement. Lastly, teacher-child interaction in the class context can function as a moderator for their relationship. In a more detailed analysis, it has been noted that the quality in teacher-child relationship changed during children's transition from kindergarten to third grade. Thus, children's relationship with their teacher seemed to be negatively affected at a small degree, when children attended primary school. Previous researchers in their effort to explain this tendency assumed that this declination was associated with the change in teacher's focus. Specifically, they argued that kindergarten teachers are more interested to construct an emotional relationship with children rather than teachers in primary school, who follow a more instructional manner of learning. This change in learning emphasis could be explained, if we take into consideration the difference in student's population between kindergarten and primary school. The number of children in kindergarten classroom is lower than in primary school. As a consequence, the increase in students' number affects teachers' psychology and makes them feel anxious, which is a factor that could justify the change in teachers' focus, which also affects the quality of teacher-child relationship.

According to data analyses, three groups of children who showed relatively similar trajectories and relationships quality at third grade were found. The first group of children had a stable-moderate relationship, the second had a declining -low relationship and the last one exhibited an inclining- high quality relationship. Children who belong to the first group did not have a significant modification in their relationship with their teachers, during their transition from kindergarten to third grade. Children who belong to the second group did not have a warm relationship with their teachers and this relationship tend to worsen gradually, as they get closer to third grade. The last group of children i.e. children who showed an inclining-high relationship with their teachers, tend to maintain a high quality relationship at third grade with insignificant increases. Most of the study population belonged to the inclining- high group (62%), with the stable-moderate group (25 %) and the decling-low group (13 %) to follow.

Another interesting study by Pakarinen et al. (2017), which was part of a larger study, examined whether teacher-child interpersonal communication and teacher's curriculum affect the development of children's reading ability during the first grade of primary school. The sample consisted of 1,029 Finnish children (523 boys) from 91 first-

grade classrooms with the majority of them having Finnish as maternal language. The results demonstrated that a high quality teacher-child relationship was associated with children's improvement in reading tasks at the end of first grade. Moreover, teacher's emphasis on the domain of reading comprehension was correlated with the improvement of reading skills. Factors like a supportive environment, explicit guidelines and classroom organization can lead to better reading skills at the end of first grade. According to the present study, a supportive teacher can activate children's positive feelings, which is necessary for the development of reading skills (Burchinal et al, 2010).

Spilt et al. (2012) extended prior work of O'Connor and McCartney (2007), examining the contribution of additional factors that affect the quality of teacher-child relationship. First of all, this study followed children's development from Grades 1 to 5. Moreover, it examined the developmental trajectory for boys and girls separately due to the fact that, in existing research data, boys and girls seemed to follow different rates of growth. The population of the study (657 students) consisted of ethnically diverse children who attended public school and showed low performance in literacy skills. Furthermore, in contrast to previous studies, this study examined the effect of dyadic interaction in middle school. Specifically, they investigated the extent to which conflict and warmth among teacher-child relationship during primary school can predict children's achievement in middle school. In this study, teacher-student relationship was evaluated by using a modified version of the child version of the Network of Relationships Inventory (NRI). Academic achievement was assessed with Woodcock-Johnson III Tests of Achievement (WJ-III), while externalizing behavior was assessed with the Conduct Problems Scale of the Strengths and Difficulties Questionnaire and cognitive ability (IQ) with the Universal Nonverbal Intelligence Test (UNIT). Results indicated that low levels of warmth are linked with low academic achievement only for boys, but not for girls. Moreover, the increase in conflict during school years was associated with decrease in academic achievement. Furthermore, African American children, low-income children and children with low IQ or early behavior problems were more prone to experience a low quality relationship that could negatively affect the trajectory of academic achievement. These children could be considered as high-risk children for academic failure. In accordance with the initial assumption, results showed that there was a low stability in warmth during the years, which reinforces previous theories that teacher-child closeness highly dependent on individual teacher and child characteristics (Mashburn et al., 2006; Silver et al., 2005). Also, in agreement with previous studies, it was found that the intensity of warmth seemed to abate to a small degree as children grew up (Jerome et al., 2008; O'Connor & McCartney, 2007). As we have already mentioned before, African American children, children with initial behavior problems, and children with low IQ were more likely to develop low levels of warmth throughout elementary school. However, in this study has been demonstrated that the aforementioned groups of children, that experience low-quality teacher-child relationships, showed a gradual improvement in warmth and in the quality of their relationships, though this change was not statistically significant. With regard to

conflict dimension, an increase during elementary school was detected for both boys and girls that continued to remain stable in a high extent year-to-year. However, specific subgroups such as children with low IQ, early behavior problems, African American, and economically disadvantaged children, demonstrated a slightly increasing level of conflict throughout elementary school. More specifically, it has been showed that more than one third of the participants, boys or girls, experience fluctuating patterns of conflict, though this group of children did not significantly differ with regard to SES, IQ and race when compared to the group of children with more stable profile. Additionally, when compared the two sexes, boys demonstrated more conflict and lower level of warmth, though the trajectories of warmth and conflict were almost similar between boys and girls. As expected, boys with high levels of conflict demonstrated significant underachievement levels. Finally, based on the type of conflict experienced by children, various subgroups have been formed, leading to various interesting observation for both academic achievements and relationship quality.

Hajovsky et al. (2017) in their study focused on the contribution of gender in the mutual formation of teacher-child closeness, teacher-child conflict, as well as the influence of these in mathematics and reading achievement. The population of the study consisted of children who attended in first, third and fifth grade of elementary school and were ethnically diverse. Research data were derived from Phases II and III of a longitudinal study of the National Institute on Child Health and Human Development Study of Early Child Care and Youth Development (NICHD SECCYD). The Student-Teacher Relationship Scale (STRS) had been chosen from the researchers in order to evaluate teacher-child relationship quality, whereas for academic achievement measurement was used one reading and one mathematics subtest from the Woodcock-Johnson Revised Test of Achievement (WJ-R). The findings of the present research revealed that there was a relative stability between gender and time. Specifically, regarding the closeness dimension, both genders tend to display a gradual decrease and this decrease is stronger for males rather than for females. In the opposite aspect, i.e. in the conflict dimension, males are more prone to show an increase over time, whereas females remain in a stable level. Moreover, males exhibit an increasing heterogeneity in their relationship quality with teachers across grades. In statistic analysis, SES seemed to have a significant influence in teacher-child closeness for females at first grade. Thus, children whose family had higher income showed higher performance in math and reading and their conflict with teachers characterized by lower levels rather than economically disadvantaged children. In case of females, higher income was closely related with higher levels of teacher-child closeness. In addition, the findings of the current study overlapped with previous studies demonstrated that African American students experience a more conflictual relationship with teachers than their classmates and as a consequence they performed poorly in math and reading at first grade. Another interesting finding, which was in accordance with previous studies (e.g. Hughes et al., 2008) confirmed that math achievement can predict subsequent changes in both closeness and conflict, which accompanied teacher-child relationships. However, reading achievement was not a direct predictor for the following teacher-

child relationship quality and also long-term changes in children's academic trajectory for math and reading was not closely affected by teacher-child relationship quality for both genders. One of the most statistically remarkable findings of this study regarding gender was that males' previous achievement in math seemed to affect the subsequent math achievement, in oppose to females.

Ly et al. (2012) conducted a study examined whether a teacher-child relationship quality can affect children's math and reading achievement with the population of the study (N=207) consists of socio-economically diverse, Chinese American children, who attended at first and second grade and came from immigrant families. One innovation of the current study was the bidirectional rating of teacher and child for their relationship quality. Moreover, because of the significant role that gender seems to play between teacher-child relationship quality and academic achievement (Baker, 2006; Ewing & Taylor, 2009), researchers looked for males' and females' deviations. Teacher Relationship Inventory (TRI) was used for the measurement of teacher's perceptions of relationship quality with a particular student, whereas in case of children's perception was used an adapted version of the Student-Teacher Relationship Scale (STRS). Children's academic skills in math and reading were assessed with the Woodcock-Johnson III Tests of Achievement III (WJ III). Results indicated that teachers' positive evaluation of their relationship with students was closely related with children's higher academic outcomes. In addition, teachers' rating of conflict was a negative predictor for math achievement only for females, but not for males. As far as child-rated of teacher-child relationship quality concerned, research's outcomes revealed that was positively associated with males' subsequent reading achievement, whereas in case of females was not a positive predictor. In conclusion, results of the present study propose that a high teacher-child relationship quality is related with higher levels of academic achievement among Chinese American children in immigrant families. Nevertheless, it has been observed that these associations between the two opposite dimensions of teacher-child relationship quality (closeness and conflict) and children's achievement varied depending on the domain of achievement (reading/math), child gender and the kind of reporter of teacher-child relationship quality (teacher/child).

Another interesting investigation oriented to African American children carried out from Iruka et al. (2010). Particularly, they tested whether the relationship quality of African American children with their mothers and teachers in kindergarten can positively predict their future academic and social development during elementary school (from first to fifth grade). Moreover, the study emphasized on the effect of children's pre-school care centers and also on the ethnicity of kindergarten teacher as factors that can moderate teacher-child relationship quality and therefore children's subsequent social and academic trajectories. In our review, we will present only the results of contribution of kindergartens teachers' to children's following social and academic growth in elementary school. Data came from National Institute of Child Health and Human Development Study of Early Child Care and Youth Development (NICHD SECCYD). At the study participated 95 families that met the inclusive criteria. For the evaluation of children's academic and social skills as well mothers' and

teachers' ratings were used some appropriate tools. Thus, teacher-child relationship were measured using the Student-Teacher Relationship Scale–Short Form (STRS), whereas mother-child relationship with the Parent-Child Relationship Scale (PCRS). Subscales of the Woodcock-Johnson Revised Tests of Achievement (WJ-R ACH) were used in order to evaluate children's academic achievement and Teacher Report Form (TRF) for the assessment of children's behavior problem. Results indicated that according to teachers' reports, children developed better social skills, when kindergarten teachers reported that they experienced a close relationship with them. On the contrary, kindergarten teachers reported more behavioral deficits when they rated that they experienced a more conflictual relationship with children. A finding of the present study, which was in contrast with previous findings, was that even if case African American children developed a close relationship with their teachers, children showed an increased aggressive behavior. According to statistic analyses, it has been shown that teacher-child relationship quality (closeness or conflict) did not play a significant role in African American children's reading development, but was associated with their social behavior. In the field of math achievement, African American children who had the same ethnicity with kindergarten teacher showed a gradually increase with their transition from kindergarten to elementary school, but a small decrease in the growth of reading and social skills. Specifically, it has been observed that these children had higher scores in mathematics from first to fifth grade in combination with a rapid acquisition of numeracy skills between first and third grade. In addition, the experience of pre-kindergarten center care was linked with decrease in children's reading outcomes over time but with increase in social skills, as reported by teachers.

In another interesting study McCormick et al.(2017) inspected the extent to which the two dimensions of teacher-child relationship quality (i.e. closeness and conflict) can modify the impacts of socioeconomic status(maternal education and family income) in early childhood on math and reading achievement in elementary school. The present study used data from the first two phases of the NICHD SECCYD, a prospective study of children from birth through adolescence. Researchers used some appropriate tools in order to measure teacher-child relationship and children's academic achievement. Thus, the Student-Teacher Relationship Scale (STRS) was used to assess teacher perceptions of the quality of the teacher-child relationship in first, third, and fifth grade, whereas for the assessment of reading and math achievement was used the Woodcock– Johnson Psycho Educational Battery (WJ–R), administered in first, third, and fifth grades by field interviewers. Results demonstrated that there was a close association between maternal education and family's income from one side and children's academic skills and the quality of teacher-child relationships to the other side. Specifically, lower levels of maternal education in combination with a conflictual relationship among teacher and child led child to perform poorly in reading tasks during elementary school. Simultaneously, children who showed an increase in the dimension of closeness in teacher-child relationship and decrease in conflict, whereas maternal education level was in a low level showed amelioration in reading

achievement across elementary school. In a more detailed analysis, teacher-child conflict showed an increase between first and third grade and followed a declined trajectory in fifth grade. Thus, we can understand the significant role that a high quality teacher-child relationship plays in support of children's reading achievement, especially in case of children with low maternal education. In contrast, it was found that the association between teacher-child relationship quality and math achievement was not affected by maternal education level. However, results indicated that the lack of high teacher-child quality was a negative predictor for high levels of math achievement in economically disadvantaged children. Overall, a low maternal education level is closely related with low levels of children's reading achievement and a low family income is closely associated with low levels of math achievement in elementary school children. In both cases, the contribution of a high teacher-child relationship quality can promote children's academic achievement.

McCormick et al. (2015) in their study examined between- and within child effects of the two dimensions of teacher-child relationship quality (closeness and conflict) on reading and math achievement during elementary school and especially in first, third and fifth grades. Moreover, they sought whether existed gender differences in teacher-child relationship quality, which could influence children's performance in reading and math. Researchers used data from the first two phases of the NICHD SECCYD, a prospective study of children from birth through adolescence. In order to evaluate teachers' perception about their relationship with children, researchers used the Student Teacher Relationship Scale (STRS), whereas reading and math achievement were measured with the Woodcock-Johnson Psycho-Educational Battery (WJ-R) Study's outcomes revealed that there was a general increase in children's math and reading achievement across elementary school years. According to the dimension of closeness, children displayed the tendency to show a gradual decrease, whereas teacher-child conflict increased between first and third grade and decreased with children's transition to fifth grade. Concerning to gender, boys experienced more conflictual relationships with their teachers in comparison to girls, who developed closer relationships with teachers at all grades. Although girls had on average warmer relationships with teachers, boys tend to perform better on math and reading tasks in first grade with the declination got smaller in third and fifth grades. Specifically, boys who developed a conflictual relationship with teachers had higher levels of achievement on math than girls who had a conflictual relationship with teachers. Moreover, results indicated a significant between-child effect of teacher-child conflict on reading achievement, while the between-child effect of teacher-child closeness was not statistically significant for math and reading achievement. In the field of the within-child effects of teacher-child quality relationship on math and reading achievement results demonstrated a statistically significant within-child effect of teacher-child closeness only for reading achievement, but not for math. On the contrary, the within-child effects in the dimension of teacher-child conflict were nonsignificant for both math and reading achievement. Overall, results showed that boys and girls did not differ significant in

both between- and within-child effects of teacher-child closeness and conflict on math and reading achievement.

Blair et al. (2016) conducted a study in which examined whether executive function abilities and a high quality relationship with kindergarten teacher can moderate children's prior mathematic ability in prekindergarten years. Moreover, they tested the extent to which these preschool mathematics abilities associated with mathematic achievement at the end of kindergarten. The population of the study (N=1005) consisted of ethnically diverse children who assessed at three time periods, at the age of 48 months, at preschool years and when they attended in kindergarten. For the assessment of executive functions children were administered a battery of six executive function tasks that measured working memory, inhibitory control, and attention shifting, and validated for use with 3- to 5-year-olds, whereas for the evaluation of teacher-child relationship used the Student- Teacher Relationship Scale (STRS). In order to measure children's mathematic ability at preschool and kindergarten years were used two different instruments, the ECLS-K Math battery and the Applied Problems subtest of the Woodcock-Johnson III Tests of Achievement. Moreover, the Peabody Picture Vocabulary Test 4th Edition (PPVT) administered to children at preschool years so as to measure children's verbal intelligence. Multilevel regression results revealed that preschool mathematic ability was closely related with subsequent mathematic achievement in kindergarten. Moreover, children's gender seemed to play a significant role in children's mathematic achievement due to the fact that boys had higher mathematic scores than girls. An interesting aspect of the present study was that used two different instruments in order to assess children's mathematic ability (the ECL-K math assessment and the Applied Problems subtests). However, this selection in assessment, in some cases, led to different results. Specifically, according to statistic analysis of ECL-K math assessment, but not according to Applied Problems subtests, children who developed higher levels of executive function abilities and experienced a closer relationship with kindergarten teacher scored higher in mathematics than expected, although their mathematic ability in preschool years was in lower levels. On the contrary, children who had lower levels of mathematic ability in preschool years in combination with low executive function abilities and a non-supportive teacher in kindergarten continued to perform poorly in mathematic tasks.

The association of teachers' individual support in reading and how this affected the development of children's reading skills concerned Silinskas et al. (2016). Particularly, considering that teacher-child is a relationship characterized by heterogeneity, they tried to detect different groups of teacher-child dyads that could lead to different types of associations between teachers' enhancement in reading process and the growth of children's reading ability. Furthermore, they searched for possible factors that could explain the differences between the detected groups of teacher-child dyads. Participants were 372 Finnish children and 139 teachers derived from a longitudinal study of 2000 children from kindergarten to 4th grade of elementary school. Children's reading skills were assessed in two time points: at the beginning of 1st grade and at the end of 1st grade by using a group of subtest of the

nationally standardized reading test battery (ALLU). For the evaluation of children's interest in reading was used the Task Value Scale for Children (TVS-C), whereas for teachers' stress rating was used a modified version of Gerris's Parental Stress Inventory. Children's externalizing and internalizing problem behaviors were assessed using a Finnish version of the Strengths and Difficulties Questionnaire (SDQ) and also was measured the individual support in reading that teachers provided to children. Results indicated three separate groups of teacher-child dyads as they emerged from the association between teachers' enhancement in reading and children's acquisition of reading skills. The first group included children who showed an increase in teachers' support, which positively associated with higher levels of children's reading skills. In turn, higher levels of teachers' support in reading for a particular child was in close relationship with the reading skills of those children who adapted a positive attitude towards reading as they entered school and also who characterized by low level of externalizing problem behavior. Moreover, higher levels of teachers' support in reading for a particular child seemed to be in a close association with children's ability in reading, in case teachers feel that their support has been accepted with bigger pleasure by children and also when teacher did not experience a stressful situation. On the contrary, the second group of teacher-child dyads characterized by lower levels of reading development irregardless of the increased support that teacher provided. Specifically, children who belong to this group tend to be aloof in reading process with their entrance at school and are more likely to face externalizing problems in 1st grade. In this group, the provided teachers' support had a negative impact on teacher-child relationship quality due to the unpleasant feelings that provoked among teachers and children and also was a factor that caused more stress on teachers. In the last group, the acquisition of children's ability to read was not associated with teachers' support. Particularly, children in this group showed high levels of interest in reading even from the first school years, manifested low externalizing problems behavior and according to teachers' report experienced a high relationship quality with them. Results of the present study highlight the idea that there is a group of children who faced such severe learning difficulties that teachers' support is not adequate in order to promote the development of reading ability, at the same speed as their other classmates.

Curby et al. (2009) conducted a study in order to test whether the quality of teacher-child relationship and children's initial achievement level at the beginning of kindergarten affected children's subsequent academic trajectory in the end of kindergarten and in 1st grade. Specifically, they examined 147 children's performance on the domain of word reading, phonological awareness and mathematics. Researchers measured teacher-child interaction quality with the Classroom Assessment Scoring System (CLASS) and children's academic achievement with the Woodcock-Johnson III Tests of Achievement (WJ III). There were four main findings. First of all, it was detected a significant diversity in children's initial level of achievement and in the developmental rate of word reading, phonological awareness and mathematics across kindergarten and 1st grade. This heterogeneity in children's academic skills level and in their developmental rate lead teachers to apply different kinds of teaching, which may

satisfy only the needs of students who scored lower in learning activities and not be appropriate for children who have higher scores. In contrast to our expectations, the present study demonstrated that students with lower levels of achievement showed a greater development trajectory in phonological and mathematics skills than students with higher levels of achievement. A possible explanation for this finding is due to the major support that teachers provide to students with low scores of achievement in contrast to higher achieving children, who may not receive equal support. In addition, it was proved that children's initial level of achievement at kindergarten was a strong predictor for children's subsequent rate of growth. Also, 1st grade teachers who were emotionally engaged with children in learning process provided a meaningful support in the development of phonological awareness. Specifically, in the domain of word reading, children who entered kindergarten and characterized by low levels of achievement showed greater development in classrooms where their 1st grade teachers provide more instructional support, but were less emotionally engaged with them. In contrast, concerning mathematics, children with lower achievement levels showed greater development in kindergarten classrooms which were better organized. Moreover, children who scored higher in initial word reading benefited more in word identification in classroom environments where teachers were more emotionally engaged with them. In contrast, children who had lower levels of initial word reading benefited more in classroom settings where teachers are less emotionally engaged.

Wolter et al. (2014) focused their research on the contribution of kindergarten teacher in the growth of children's early literacy skills in females and males children who attended in kindergarten, considering how gender-oriented activities, a warm teacher-child relationship, as well as children's gender affect this development. The population of the study consisted of 135 German kindergarten children and their teachers, who were all females. The following research instruments were used in the current study: Student-Teacher Relationship Scale (STRS) for the assessment of teacher-child relationship quality, the Bielefelder Screening zur Früherkennung von Leserechtschreibschwäche (BISC) in order to measure the phonological skills and the Weingartner Grundwortschatz-Rechtschreibtest (WRT 1+) for the measurement of children's spelling competence. According to kindergarten teachers, reports the type of activities that they provided to kindergartners were mainly oriented to females interests than to males and also they referred that experienced closer relationships with girls than with boys. Phonological skills were measured at the end of kindergarten proved that girls had statistically higher scores in these early literacy activities than boys. On the contrary, there were no detected gender differences in spelling competence measured one year later as a possible predictor for the development of early literacy at the end of 1st grade. Moreover, results revealed that children whose relationship with their kindergarten teachers characterized by closeness showed advanced early literacy skills and specifically in the domain of spelling competence, at the end of 1st grade, in case of kindergarten teacher selected activities that were oriented to children's gender nature and not to the opposite gender. In a more detailed analysis, boys who experienced a close relationship with their kindergarten teachers tend to show higher

levels of spelling competence by the end of 1st grade, in classrooms where kindergarten teachers reported that selected activities which stimulated boys' interest. Accordingly, girls who developed a close relationship with their kindergarten teachers scored higher in spelling competence activities by the end of 1st grade, in classrooms where kindergarten teachers reported that offered activities which were in absolute accordance with girls' interest. The findings of the current study underline the need kindergarten teachers to choose learning activities that satisfy both gender interests.

Decker et al. (2009) interested in African American children, who are a special group of children characterized as behaviorally at-risk. Specifically they examined the vital role of teacher-child relationship at students' outcomes (i.e. social, behavioral, engagement and academic) with the population of the study consisted of 44 students who attended from kindergarten through sixth grade. In the present review, we will analyze only the contribution of teacher-child relationship in academic outcomes, which was in direct association with literacy development. It is important to mention that the current study examined the quality of teacher-child relationship from both the student's and teacher's perspective, exposing us to multidimensional observations. Decker et al. used a number of instruments in order to measure students' performance before and during research process. Thus, the Student-Teacher Relationship Scale (STRS) was used to assess teachers' perception for their relationship quality with student, whereas the relatedness scale measured the Psychological Proximity Seeking and the Emotional Quality of students' relationship experiences with their teacher. Moreover, for the social and emotional functioning measurement was used the Social Skills Rating System including both Teacher-Report (SSRS-TR) and Child-Report (SSRS-CR). For the evaluation of academic performance utilized the Academic Performance Rating Scale (APRS) and the Curriculum-Based Measurement (CBM): Oral Reading Fluency (ORF) in order to inform for children's reading ability. Information regarding children's early literacy skills were drawn from Dynamic Indicators of Basic Early Literacy Skills (DIBELS) and especially from the domain of Letter Naming Fluency (LNF). Statistic analysis revealed that in oppose to our expectations, children expressed their will for developing closer relationships with teachers and also referred a more positive perception of their relationship with teachers. Contrariwise, teachers had the tendency to evaluate their relationships with children as less positive. A possible explanation for the different perspective between children and teachers may be due to the negative feelings that teachers are likely to experience in their interaction with children. Moreover, the findings of the present study proved that teachers' perception of their relationship with African American students were not in close association with children's academic achievement, a finding that was in the opposite direction with the results of past studies (Hamre & Pianta, 2001). Another purpose of the research was to illuminate which type of student's outcomes associated more with teacher-child relationship. Results indicated that teacher-child relationship was a strong precursor mainly for social-emotional functioning and engagement outcomes and less for academic outcomes. Thus, when students reported that they developed a warm relationship with teachers, the amount of time they dedicated in learning tasks

increased significantly. This could mean that children, who believe that they experience a close relationship with teachers, are more academically engaged in learning activities during lesson. In particular, the domain of later naming fluency showed increase, in case of children who expressed an increased desire to have closer relationships with their teachers. In addition, the issue of children's desire to develop a warm relationship with their school caregivers is extremely helpful, due to the fact that boost children's moral to participate actively in learning activities that promote the emergence of early literacy skills. Overall, the results of the present study highlight the crucial role of teacher-child relationship in predicting students' outcomes for behaviorally at-risk African American students.

Student's perception of their relationships with teachers remains a topic of great interest, as well as quite complex to study. Hughes (2011) tried to prospectively study how students' perceptions of teacher-student relationship quality (TSRQ), influence their academic self-view and their sense of social engagement. In addition, this study also aimed to demonstrate how students' perceptions of the relationship could affect their academic achievement. Researchers drawn data from a longitudinal study that followed children for 4 years and remained active at year 4. The overall sample of children who participated in the present study and met the criteria consisted of 714 ethnically diverse and academically at-risk children. In order to assess student's perceptions on their relationship with their teachers, the Network of Relationships Inventory (NRI) was used. A modified version of NRI was used also for teacher. A previously validated and used 11-item questionnaire was used, in order to evaluate teachers rated students' classroom engagement. The Psychological Sense of School Membership Scale, the Competence Belief and Subjective Task Values Questionnaire, and the WJ-III Tests of Achievement, were used to assess school belonging, child-rated academic self-efficacy and academic achievement respectively. Finally, cognitive ability was assessed with Universal Nonverbal Intelligence Test (UNIT). One of the first observations of this study was that teacher reports of their relationship with children was more uniform, compared to children's perceptions. Though, there are differences between teachers and students with regard to support, there is a consistency between them when it is about conflict. Of great interest was the observation, that children who believe that their relationship with teacher is conflictual, they simultaneously consider the teacher as emotionally supportive. However, it should be noted that children's perception of conflict was higher, in these cases where teachers reported a conflictual relationship. A key finding of this study is that measures of TSRQ were significantly related with improvements in academic self-views. Though the association between TSRQ measures and academic achievement was not so strong, authors consider this observation important for children's future development. Notably, this study outlined the importance of children's perceptions of TSRQ, beyond teacher's report, on their personal, social and academic engagement and development.

The association between externalizing behavior problems, teacher-student relationship quality, and academic performance in young urban learners is a recent research carried out by Fowler et al. (2017). Specifically, they looked for existing

associations among teachers' reports of students' social skills and academic performance, as well as teacher-child relationship quality. In this study participated a total of 230 students, who are mainly African American children and came from families with poor socioeconomic status. Useful tools were used before and after the research process. Thus, the Student-Teacher Relationship Scale (STRS-short form) was used to evaluate teachers' perception about their relationship with students and an adapted scale from the NICHD Study of Early Child Care and Youth Development was used to measure children's academic development. The Teacher Report Form (TRF) of the Child Behavior Checklist (CBCI) and the Strengths and Difficulties Questionnaire (SDQ) were used, in order to measure children's strengths and deficits. Although, the present study provided extensive findings regarding the relationship between children's externalizing behavior problems and the quality of teacher-child relationship, we will present only the results of the association of teacher-child quality relationship and whether this relationship influenced children's academic performance. Generally, it was proved that the overall teacher-child relationship was positively linked with academic ratings. In a more detailed analysis, examining the quality relationship between teachers and students, it was not detected a statistically significant influence in the way teachers assessed children's academic performance. However, researchers pointed out that this issue is needed to be examined thoroughly in future studied due to the limited findings in their research. Moreover, results demonstrated that children who characterized by low-quality relationship with teachers displayed the tendency to have lower academic outcomes than their classmates who experienced a closer relationship with their school caregivers. In addition, students were inclined to follow a gradual decrease in their quality relationship with teachers from kindergarten through 3rd grade, as reported by teachers. Another interesting finding of this research revealed that teachers' ethnicity seemed not to affect his/hers perception about children's academic performance and also his/hers evaluation of their relationship quality.

Learning to read and spell is a strong foundation for the construct of children's overall academic learning. Kiuru et al. (2012) researched the association between the different styles of parenting, as well teachers' styles and their contribution in children's reading and spelling development. However, due to our focus on teacher-child relationship and children's literacy, we will present only the results regarding teachers' styles and how they affected children's learning development with the population of the study consisted of 864 Finnish –speaking children. The Teacher Interactional Style Scale was used in order to assess teaching styles and the nationally normed reading test battery (ALLU) for reading skills. First of all, the findings of the present research revealed that an authoritative teaching approach was positively associated with children's spelling development from 1st to 2nd grade. Specifically, an authoritative teacher was proved to be extremely helpful in children's spelling growth especially at this group of children who were not able to read in kindergarten, but simultaneously did not characterized as "at risk" for reading difficulties. Moreover, it was demonstrated that an authoritative teacher could function positively in case of these children in order to help them overcome possible negative experiences on reading

development coming from dysfunctional parenting. According to statistic analysis, were found two teachers' styles: an authoritative interactional style and a disengaged interactional style. The first style of teaching, the authoritative interactional teaching, is distinguished for high levels of both affection and behavior control, in contrast to disengaged interactional teaching, in which affection and behavior levels maintain low. Overall, this study adds to the existing literature by examining both the contribution of parenting and teaching interactional styles on children's reading and spelling development from 1st to 2nd grade.

To date, there is a small percentage of literature research focus on the effects of children's characteristic (ethnicity, gender) and processes (behavior, literacy) in the construct of teacher-child relationship quality and especially with young participants living in rural communities. Gallagher et al. (2013) in their study examined the role of the above mentioned factors, as well as teachers' characteristics in the formulation of teacher-child relationship quality with the population attending at rural kindergarten and 1st grade classrooms. An interesting aspect of this study is that measured the quality of teacher-child relationship quality in two separate time periods, in the fall and in the spring of the same school year. A number of appropriate tools were used in order to evaluate children's literacy skills and behavior. The Classroom Behavior Inventory was used to rate children's competence and adjustment in school, whereas children's literacy competence was assessed with Woodcock Johnson Tests of Achievement III (WJTA, III). Finally, teacher-child relationship was measured by the Student Teacher Relationship Scale – Short Form). The findings of the present study indicated a remarkable association between children's demographic factors, processes factors and increase in conflict dimension in teacher-child relationship. Demographics elements, like gender and ethnicity, were proved to influence the quality of teacher-child relationship during school year. Specifically, boys and African American children were more prone to experience higher levels of conflict in their relationship with school caregivers in spring rather in fall. Moreover, it was observed that, when behavior problems and literacy skills were included in statistic analysis, the contribution of gender's effect in teacher-child relationship quality decreased. However, this finding did not apply in case of African American students, who maintain high levels of conflict in their relationship with teachers regardless of behavior or literacy skills.

3. Discussion

Teacher-child relationship and its role in the development of children's literacy, especially at the acquisition of reading, writing and numeracy skills, is a topic of extensive research the last years. Early and recent data highlight the crucial role of the teacher in children's personality development, as a unique person, as well as part of society. It is true that children, from a very early age, even before entering school, interact mainly with persons from its family environment, especially with mothers, that substantially affect children's academic (Spieker, Nelson, Petras, Jolley, & Barnard, 2003) and social-emotional development. Daily interaction with family environment,

unavoidably leads children to adopt specific behavioral patterns, which in some cases could negatively affect children's personality (for example, in cases of maternal rejection or emotionally unstable parental environment). Next socialization step for most of the children is school. Teacher-child interaction begins with child entering school environment. As a consequence, after family, school plays a vital role in child's personality. Various real-life and research data demonstrate that factors such as, low-income, ethnicity (Hamre & Pianta, 2001; Hill et al.,2004) behavioral problems (Nelson, Benner, Lane, & Smith, 2004) or male sex (Hamre & Pianta, 2001) could negatively affect teacher-child relationship. According to the results of many studies, children who experience higher quality relationships with teachers showed better academic performance than children with lower quality relationships (Furrer & Skinner, 2003; Pianta & Stuhlman, 2004). Therefore, a conflictual teacher-child interaction could lead to low academic achievement in oppose to a supportive learning environment and a positive teacher-child relationship that could improve child's performance and reinforce their participation in learning activities.

Most previous or ongoing research studies are mainly focusing on children's numeracy skills, as well as on their literacy and language skills in order to test the effect of teacher-child relationship on their academic performance. Importantly, research data highlight the crucial role of kindergarten teacher for the subsequent development of children's mathematical and literacy skills. It has been demonstrated that the development of a strong relationship with kindergarten teacher, helps children with their future academic performance (Hamre & Pianta, 2001). Key role in this process plays the participation of the children in learning activities that strengthen their communication and language skills.

However, a key point in most of the studies in this field is the way teacher-child relationship is being evaluated. In almost all studies, the assessment of teacher-child relationship is based on questionnaires filled by teachers. For this reason, it is important to keep in mind that answering the questionnaires could be affected by teacher's personal opinion. Another key point that should be noted is that most of the existing studies are focusing on kindergarten and primary school children. That means that data regarding the quality and the role of teacher-child relationship in older ages are limited. Furthermore, it is important to take into account the sudden increase of new technologies, web and social media from children of all ages, during the last decade. As a consequence, a very interesting topic that should be examined is how technology affects teacher-child relationship and subsequently their academic performance. Moreover, going beyond the evaluation of teacher-child development, it always remains very interesting design research studies examining potent interventional methods, including the use of new technologies, on how to improve teacher-child interaction and help children to improve their personal, academic and social skills.

Appendix: Summary of Papers found in the Systematic Literature Search

Author, date	Study population Number Age at data collection Sample information	Tools/ Measures	Dimensions	Type of analysis	Results
1.McCormick et al, 2013	N children=324 N teachers=112 Kindergarten and 1 st grade Low-income, black and Hispanic children	1.Student-Teacher Relationship Scale(STRS) 2.Letter-Word Identification and Applied Problems subtests of the Woodcock-Johnson III Tests of Achievement, Form B (WJ III) 3.Family Involvement Questionnaire for Elementary School (FIQ-E) 4.Sutter-Eyberg Student Behavior Inventory 5. Leiter International Performance Scale—Revised 6. Academic Competency Evaluation Scale	Mathematic and reading achievement	Multilevel propensity score matching approach Multilevel regression analysis	Results revealed significant effects of high-quality teacher-child relationships in kindergarten on math achievement in first grade. No significant effects of teacher-child relationships were detected for reading achievement.
2.White, 2013	N children=127 N teachers=20 Kindergarten and 1 st grade	1.Student Teacher Relationship Scale, Short Form (STRS) 2Feelings About School Scale (FAS) 3.Peabody Picture Vocabulary Test (PPVT) 4.Initial reading status and grade level 5.Interactive and didactic teaching 6. Writing quality	Writing achievement	multilevel regression analysis null model	A conflictual teacher-child relationship seemed to affect negatively children's writing achievement. On the contrary, a warm teacher-child relationship seemed not to affect children's writing performance, but was associated with higher receptive language scores.
3.Hughes et al,2007	N children=443 1 st grade ethnically diverse, lower achieving readers	1.Woodcock-Johnson III (WJ-III) Tests of Achievement 2.Batería Woodcock-Muñoz 3.Big Five Inventory (BFI) 4.Teacher Relationship Inventory (TRI) 5.Teacher-report	Academic Achievement	mixed-analysis procedure	African American children are less likely to develop a close relationship with their teachers which could affect children's academic achievement.

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		home-school relationship questionnaire 6.A modified version of Class Play			
4.Liew et al, 2010	N children=761 1 st and 2 nd grade low-income and ethnic minority	1.Behavioral Battery 2. Inhibitory control 3.Task accuracy 4.Teacher-Student Relationship Inventory (TSRI) 5. Woodcock-Johnson III Tests of Achievement (WJ-III) 6.Woodcock-Muñoz Language Proficiency Test 7.Universal Nonverbal Intelligence Test (UNIT)	Mathematic and reading achievement	Multilevel regression analysis	Children's sociodemographic variables such as high IQ, female sex, family's high income, and non-African American status were closely related with reading or mathematics achievement. Also, children who demonstrated low task accuracy but have a close relationship with their teacher, perform alike with high task accuracy children. Concerning inhibitory control and warm teacher-student interaction, findings demonstrated that there was a positive association with reading and mathematics achievement one year later.
5.Maldonado-Carreño et al,2011	From kindergarten through 5 th grade	1.Woodcock-Johnson Psycho-Educational Battery (WJ-R) 2. Child Behavior Check-list 4/18 (CBCL) 3. Teacher Report Form 4/18 (TRF) 4. Student- Teacher Relationship Scale (STRS)	Academic achievement	two-level hierarchical linear models	The quality of teacher-child relationship was linked with children's level of achievement from kindergarten throughout fifth grade. Within-child positive changes in relationship quality, was importantly linked to improvements in academic skills, especially with regard to language and literacy, as well as mathematics.
6.O'Connor et al,2007	N children=880	1. Woodcock Johnson Psycho-Educational	Academic achievement	Hierarchical multiple	A positive teacher-child relationship

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	pre-school through 3 rd grade	<p>Battery-Revised (WJR)</p> <p>2. Bayley Mental Development Index</p> <p>3. Child Behavior Checklist (CBCL)</p> <p>4. Student-Teacher Relationship Scale (STRS)</p> <p>5. Quality of peer relationships</p> <p>6. Classroom Observational System (COS)</p>		regression models	was closely related with children's achievement. In addition, a positive relationship among teacher and child can protect child from previous negative experiences of insecurity or other emotional obstacles that could affect children's achievement. Lastly, teacher-child interaction in the class context can function as a moderator for their relationship.
7.Pakarinen et al,2017	N children=1029 N teachers=91 1 st grade Finnish children	<p>1.reading test for primary school (ALLU)</p> <p>2.Classroom Assessment Scoring System (CLASS K-3)</p>	Reading achievement	multilevel modeling	Children develop better reading skills at the end of 1 st grade, in classrooms where teachers were warm, supportive and emotional engaged in children's needs. Moreover, when teachers provided well-planned activities, clear rules, and expectations for behavior.
8.Spilt et al,2012	N children=657 1 st to 6 th grade ethnic-diverse sample academically at-risk children	<p>1.Network of Relationships Inventory (NRI)</p> <p>2.Woodcock-Johnson III Tests of Achievement (WJ-III)</p> <p>3. Strengths and Difficulties Questionnaire</p> <p>4. Universal Nonverbal Intelligence Test (UNIT)</p>	Academic achievement	<p>mixture models (GMMs)</p> <p>Mplus</p>	Low levels of warmth are linked with low academic achievement only for boys, but not for girls. Moreover, the increase in conflict during school years was associated with decreased in academic achievement. Children with low IQ, early behavior problems, African American, and economically disadvantaged children, demonstrated a slightly increasing level of conflict

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					throughout elementary school.
9.Hajovsky et al, 2017	N children=1133 Elementary school	1.Student-Teacher Relationship Scale (STRS) 2. Woodcock- Johnson Revised Test of Achievement (WJ-R)	Math and reading achievement	Multiple group longitudinal panel model Model evaluation	A relative stability between gender and time. Both genders tend to show a decrease in closeness across time, which is stronger for males. In conflict dimension males show an increase, whereas females remain a stable level. Children with higher family income had better scores in math and reading tasks and their conflict with teachers characterized by lower levels. Also, African American students experience a more conflictual relationship with teachers than their classmates and as a consequence they performed poorly in math and reading at first grade. Moreover, males' previous achievement in math seemed to affect the subsequent math achievement, in oppose to females.
10.Ly et al, 2012	N children=207 1 st and 2 nd grade Immigrants families Chinese American Children	1.Teacher Relationship Inventory (TRI) 2.Adapted version of the Student-Teacher Relationship Scale (STRS) 3. Woodcock -Johnson III Tests of Achievement III (WJ III).	Academic achievement	Correlation analyses Regression analyses	Teachers' positive evaluation of their relationship with students was closely related with children's higher academic outcomes, whereas, teachers' rating of conflict was a negative predictor for math achievement only for females, but not for males. A high teacher-child relationship quality is related with higher levels of academic

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					achievement among Chinese American children in immigrant families. Child-rated of teacher-child relationship quality was positively associated with males' subsequent reading achievement, but not with females.
11.Iruka et al, 2010	N children = 95 From kindergarten to 5 th grade African American children	1.Student-Teacher Relationship Scale–Short Form (STRS) 2. Parent-Child Relationship Scale (PCRS) 3. Subscales of the Woodcock-Johnson Revised Tests of Achievement (WJ-R ACH) 4. Teacher Report Form (TRF)	Math/reading achievement	Hierarchical linear model	Teacher-child closeness and conflict did not play a significant role in African American children's reading development, but was associated with their social behavior. In math achievement African American children who had the same ethnicity with kindergarten teacher showed a gradually increase with their transition from kindergarten to elementary school, but a small decrease in the growth of reading and social skills. Moreover, the experience of pre-kindergarten center care was linked with decrease in children's reading outcomes over time.
12.McCormick et al,2017	N children=1,053 Elementary school(1 st , 3 rd , 5 th)	1.Student-Teacher Relationship Scale (STRS) 2. Woodcock– Johnson Psycho Educational Battery (WJ–R)	Reading and math achievement	Multi-level model Uncondition al growth model Post hoc analyses	There was a close association between maternal education and family's income, and children's academic skills and the quality of teacher-child relationship. Children whose mothers had lower levels of education in combination with a conflictual relationship with teachers led child to

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					perform poorly in reading tasks during elementary school. Simultaneously, children who showed an increase in the dimension of closeness in teacher-child relationship and decrease in conflict, whereas maternal education level was in low level showed amelioration in reading achievement across elementary school. The lack of high teacher-child quality relationship was a negative predictor for high levels of math achievement in economically disadvantaged children.
13.McCormick et al,2015	N children=1,364 Elementary school(1 st , 3 rd , 5 th grade)	1.Student Teacher Relationship Scale (STRS) 2. Woodcock-Johnson Psycho- Educational Battery (WJ-R)	Reading and math achievement	Hierarchical linear modeling Unconditional growth model Post hoc analyses	A general increase in children's math and reading achievement across elementary school years. In addition, there was a significant between-child effect of teacher-child conflict on reading achievement, while the between-child effect of teacher-child closeness was not statistically significant for math and reading achievement. In the field of the within-child effects of teacher-child quality relationship on math and reading achievement, there was a statistically significant within-child effect of teacher-child closeness only for reading achievement, but not for math. On

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					the contrary, the within-child effects in the dimension of teacher-child conflict were nonsignificant for both math and reading achievement. Moreover, boys and girls did not differ significant in both between- and within-child effects of teacher-child closeness and conflict on math and reading achievement.
14.Blair et al,2016	N children=1005 Kindergarten Low income Ethnically diverse	1.A battery of six executive function tasks 2.Student-Teacher Relationship Scale (STRS) 3. ECLS-K Math battery 4. Woodcock-Johnson III Tests of Achievement(W-J III) 5. Peabody Picture Vocabulary Testd4th Edition (PPVT) 6. Income-to-need ratio	Mathematic skills	multilevel model analysis	Preschool mathematic ability was closely related with subsequent mathematic achievement in kindergarten, with boys had higher mathematic scores than girls. Children who developed higher levels of executive function abilities and experienced a closer relationship with kindergarten teacher scored higher in mathematics than expected, although their mathematic ability in preschool years was in lower levels. On the contrary, children who had lower levels of mathematic ability in preschool years in combination with low executive function abilities and a non supportive teacher in kindergarten continued to perform poorly in mathematic tasks across school years.
15.Silinskas et al,2016	N children=372 N	1.A substet of the nationally standardized reading	Reading achievement	Regression Mixture Modeling	There were found three separate groups of teacher-

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	<p>teachers=139</p> <p>Finnish children 1st grade</p>	<p>test battery (ALLU)</p> <p>2. Task Value Scale for Children (TVS-C)</p> <p>3. A modified version of Gerris's Parental Stress Inventory</p> <p>4. A Finnish version of the Strengths and Difficulties Questionnaire (SDQ)</p>			<p>child dyads as they emerged from the association between teachers' support in reading and children's acquisition of reading skills. The first group included children who showed an increase in teachers' support, which positively associated with higher levels of children's reading skills. , the second group of teacher-child dyads characterized by lower levels of reading development irregardless of the increased support that teacher provided. In the last group, the acquisition of children's ability to read was not associated with teachers' support.</p>
<p>16. Curby et al, 2009</p>	<p>N children=147</p> <p>N kindergarten teachers=31</p> <p>N 1st grade teachers=35</p> <p>Kindergarten and 1st grade</p>	<p>1. Classroom Assessment Scoring System (CLASS)</p> <p>2. Woodcock-Johnson III Tests of Achievement (WJ III)</p>	<p>word reading, sound awareness and mathematics</p>	<p>hierarchical models</p>	<p>There were four main findings. First of all, it was detected a significant diversity in children's initial achievement level and in the growth rate of word reading, phonological awareness and mathematics across kindergarten and 1st grade. In addition, it was proved that children's initial level of achievement at kindergarten was in close relationship with the subsequent rate of growth. Also, 1st grade teachers who were emotional engaged with children in learning process provided a meaningful support</p>

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					in the development of phonological awareness. Finally, children's previous skill level seemed to associated with the significant role of teacher-child quality relationship in the growth of word reading and mathematics.
17.Wolter et al, 2014	N children=135 N teachers=135 Kindergarten German children	1.Student-Teacher Relationship Scale (STRS) 2. Bielefelder Screening zur Früherkennung von Lese-Rechtschreibschwäche (BISC) 3. Weingartener Grundwortschatz-Rechtschreibtest (WRT 1+)	Spelling skills Phonological skills	multiple regression analysis	Children whose relationship with their kindergarten teachers characterized by closeness showed advanced early literacy skills and specifically in the domain of spelling competence, at the end of 1 st grade, in case of kindergarten teacher selected activities that were oriented to children's gender and not to the opposite gender.
18.Decker et al,2009	N children=44 From kindergarten through sixth grade	1.Student-Teacher Relationship Scale (STRS) 2.Relatedness Scale 3.Social Skills Rating System-Teacher Report (SSRS-TR) 4.Social Skills Rating System- Child Report (SSRS-CR) 5.Engagement vs. Disaffection: Teacher-Report 6.Engagement vs. Disaffection Scale: Student-Report 7.Academic Performance Rating Scale (APRS) 8.Curriculum-Based Measurement (CBM): Oral Reading Fluency (ORF) 9.Dynamic Indicators of Basic Early Literacy Skills (DIBELS):Letter Naming Fluency	Academic achievement	Hierarchical multiple regression analysis	Children expressed their will for developing closer relationships with teachers and also referred a more positive perception of their relationship with teachers. Contrariwise, teachers had the tendency to evaluate their relationships with children as less positive. Also, teachers' perception of their relationship with African American students were not in close association with children's academic achievement. Finally, teacher-child relationship was a strong precursor mainly for social-

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		(LNF			emotional functioning and engagement outcomes and less for academic outcomes.
19.Hughes,2011	N children=714 2 nd and 3 rd grade academically at-risk ethnically diverse	1. Network of Relationships Inventory (NRI) 2. The Psychological Sense of School Membership Scale 3. Competence Belief and Subjective Task Values Questionnaire 4. WJ-III Tests of Achievement 5. Universal Nonverbal Intelligence Test (UNIT)	Reading and math achievement	regression analysis	Children who believe that their relationship with teacher is conflictual, they simultaneously consider the teacher as emotionally supportive. However, it should be noted that children's perception of conflict was higher, in these cases where teachers reported a conflictual relationship. Though the association between TSRQ measures and academic achievement was not so strong, authors consider this observation important for children's future development.
20.Fowler et al,2017	N children=30 N teachers=20	1.Student-Teacher Relationship Scale (STRS-short form) 2. The Teacher Report Form (TRF) of the Child Behavior Checklist (CBI) 3.The Strengths and Difficulties Questionnaire (SDQ) 4. An adapted scale from the NICHD Study of Early Child Care and Youth Development.	Academic achievement	Multiple regression analysis Chi-square analysis	The overall teacher-child relationship was positively linked with academic ratings. It was not detected a statistically significant influence in the way teachers assessed children's academic performance. Children who characterized by low-quality relationship with teachers displayed the tendency to have lower academic outcomes. Students were inclined to follow a gradual decrease in their quality relationship

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					with teachers from kindergarten through 3 rd grade, as reported by teachers. Moreover, teachers' ethnicity seemed not to affect his/hers perception about children's academic performance and also his/hers evaluation of their relationship quality.
21.Kiuru et al,2012	N children=864 1 st and 2 nd grade Finnish	1.Child-Rearing Practices Report (CRPR) 2.Teacher Interactional Style Scale 3. A subtest of the nationally normed reading test battery (ALLU)	Reading and spelling development	Latent Profile Analysis	An authoritative teaching approach was positively associated with children's spelling development from 1 st to 2 nd grade and especially in cases of nonreaders in kindergarten.
22.Gallaher et al,2013	N children=199 Kindergarten and 1 st grade rural classrooms	1. Student-Teacher Relationship Scale (STRS)- Short Form 2. Woodcock Johnson Tests of Achievement, III (WJTA, III) 3. Classroom Behavior Inventory (CBI)	Academic achievement	Mixed models	It was found a remarkable association between children's demographic factors, processes factors and increase in conflict dimension in teacher-child relationship.

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