Abstract

Young children's socio-emotional skills are important for understanding their own and other's behaviours and interactions. No study in Serbia has investigated this before. In this study we explored the links between early socio-emotional skills, behaviour, and mathematics and literacy performance of preschool children in Serbia over time. Children (N = 159) aged 5-8 were rated by the teachers on their socio-emotional skills and behaviour, and their literacy and mathematics assessed at three-time points over 14 months, twice in preschool and once at entry to school. At Time 3, when children entered school, their socio-emotional skills and behaviour were associated with gender, mathematics at Time 1 and their socio-emotional and behaviour ratings at Time 2, controlling for maternal education and literacy at Time 1. Mathematics at Time 3 was associated with mathematics at Time 2, controlling for gender, maternal education, literacy and behaviour at Time 1. No socio-emotional skills or specific behaviour were significant for mathematics. Literacy at Time 3 was associated with mathematics and social skills at Time 1, and literacy at Time 2, controlling for gender and maternal education. At all three times, girls were rated more positively than boys in socio-emotional skills and behaviour, except for adjustment to school setting where there were no differences. This study offers the first insight into the links between socio-emotional skills, behaviour and mathematics and literacy performance of preschool children in Serbia which will inform the development and evaluation of interventions. Attrition of the sample limits the findings.

Keywords

Socio-emotional skills, behaviour, mathematics, preschool, Serbia

Introduction

It has become a consideration within educational policies that in order to meet the socio-economic challenges of the 21st century, a blend of cognitive and socio-emotional skills is required (Temple 2002; OECD 2015). Cognitive skills are important for successful progression into higher education and labour market outcomes (Grin 2003) while socio-emotional skills play a significant role within personal well-being, life satisfaction, healthy life styles, active citizenship and safer societies (OECD 2015).

This paper explores the socio-emotional skills and behaviour of children age 5 to 8, and the link to their mathematics and literacy performance. It reports the findings of a quantitative, longitudinal study in preschool education and entry to school in Serbia; an under-researched area. We start with specifying socio-emotional skills and behaviour. We then describe the preschool context of Serbia and introduce the aims regarding the relation between socio-emotional skills and behaviour of children and their literacy and mathematics performance.

Socio-Emotional Skills

Collins (2011) noted that early studies of children focused on independence, intelligence, honesty and sociability. The author pointed out that before the 1940s, when most mothers stayed at home and the psychoanalytic theory was developing, longitudinal studies explored independence and emotional control which were in accordance with child-rearing practice for American children. In the 1960s, researchers started investigating children's concept of self, others and the interrelation between the two; the focus was on self-regulation, including coping, inhibition and attention (Eisenberg 2002). As more mothers started working following societal and economical changes, concerns about insufficient parental affection resulted in the study of areas including attachment, care, self-regulation and psychopathology (Beatty et al. 2006; Kagan 1992; cited in Collins 2011).

Today, at the preschool and elementary school, there is a focus on socio-emotional skills including the expression and regulation of emotions, positive relationships with peers and adults, and solving interpersonal problems (Hemmeter et al. 2006; cited in Voegler-Lee and Kupersmidt 2011). For example, Voegler-Lee and Kupersmidt (2011) proposed five core socio-emotional skills: self-awareness (recognizing basic emotions), social awareness (understanding other's thoughts and feelings), self-management (emotion regulation skills), relationship skills (peers and adults) and responsible decision making (solving common social problems). Denham (2006) defined socio-emotional skills as a range of competences including emotion knowledge, emotional and behavioural regulatory abilities and social skills (Doctoroff et al., 2016). These domains correspond to the measures we use in the present study.

Much contemporary research is concerned with specifying developmental and intra-individual processes, understanding the nature of contexts, identifying the dynamics of interpersonal experience and recognizing the significance of variations in extrafamilial social contexts (Collins 2011, 7). It was beyond the present study to explore the contextual variables of children's socio-emotional, behavioural and cognitive development in the preschool and at entry to school; however, we acknowledge their importance and discuss it in the final section.

Socio-Emotional Skills at School

Children's socio-emotional competences can assist them with assessing the school setting and subsequently lead enhance their academic performance (e.g., Eisenberg 2006; Durlak et al. 2011). When children enter school and have positive peer and teacher interactions, they will develop more positive attitudes towards school tasks, engage more into school activities, be more persistent, perform higher and have higher socio-behavioral functioning (e.g., Arnold et al. 2012; Singh et al. 2002; Fantuzzo et al. 2007).

For example, Arnold et al. (2012) found that preschool children's social skills were related to their emergent academic achievement, controlling for attention and aggression problems. Further, Crosnoe et al. (2010), in a comprehensive longitudinal study that followed children from birth to fifth grade, found strong associations between teacher-student relations and children's academic achievement. Children who performed low in mathematics progressed faster in classrooms with high teacher-student relations than their peers in classrooms with poor teacher-relations. Rabiner et al. (2016) followed children during elementary school until young adulthood and found that peer relations predicted children's grades in fifth grade, controlling for early academic achievement and aggression. Moreover, Bracken and Fischel (2007) followed 4-year-olds from Head Start entry to exit and found that children's social skills and behavioural problems were significantly related to oral language, early literacy and early mathematics. More specifically, Doctoroff et al. (2016) noted that children who were rated high in socio-emotional skills performed higher in mathematics. They also pointed out that there is a reciprocal relationship as well, children's interest in learning and engagement can positively influence their socio-emotional skills.

Behavioural Difficulties

When considering socio-emotional development, behavioural domains that describe more challenging difficulties such as Attention Deficit Hyperactivity Disorder (ADHD) composed of inattention, hyperactivity and inattention, are important. Research in socio-emotional development that explored attention and behavioural difficulties started to gain prominence in the 1960s with the increase of women in the labour market and reduced parental contact, especially in the US (Collins 2011). Exploring behavioural difficulties expanded when the researchers found strong relations between children's self-regulation (controlling, directing, planning, emotion regulation and behavioural regulation) and their academic achievement (Cole, Martin & Dennis, 2004).

Behaviour at School

Studies have shown that children with ADHD symptoms display more delinquent behaviour as adolescents and achieve academically lower than their peers (Frazier et al. 2007; Author and Author 2001; Author et al. 2017). For example, Ponitz et al. (2009) showed that preschool children with high levels of behavioural regulation in fall performed high in mathematics, literacy and vocabulary in spring.

Some scholars have suggested that it is important to distinguish between behaviours that are directly relevant for learning, such as attention, and those that may be correlated with attention but are less likely to be directly linked with achievement, such as interpersonal skills and problem-related behaviours (Duncan et al. 2007; Doctoroff et al. 2016). For example, Lonigan et al. (1999) found that preschoolers' problems with attention were consistently related with their less developed early literacy skills. By exploring six large longitudinal data sets, Duncan et al. (2007) found that attention predicted children's later academic achievement with consistency. Further, Rabiner et al. (2016) showed that children with attention difficulties were 40% less likely to graduate from high school.

More specifically, McClelland, Acock and Morrison (2006) found that children's executive functions (attention, working memory, and inhibitory control) and their socio-emotional skills predicted literacy and mathematics skills from kindergarten to sixth grade. Children who were rated poorly by their teachers in these skills performed lower than their peers in literacy and mathematics (McClelland et al., 2007). The authors noted that children learn to focus their attention and control their behaviour in classroom settings as this is highly important for focusing, remembering instructions and completing tasks. In their study with 310 preschoolers, McClelland et al. (2007) found that children who were attentive and could control their behaviour performed higher in emergent literacy, vocabulary and mathematics in the kindergarten, after controlling for age, gender and language.

In a longitudinal study with a large sample of 46,369 children, Author et al. (2017) investigated the links between children's inattention, hyperactivity and impulsivity at age 5 and their attainment at age 11. They found that inattention was significantly related to low academic achievement which was not the case with hyperactivity. Being impulsive and blurting out answers was positively related with academic achievement (Author and Author 2011). A direct negative relationship between inattention in preschool years and attainment at age 16, especially among boys, was found in another longitudinal study with a large sample size (N = 11,640; Sayal et al. 2015), after controlling for child IQ, parental education and socioeconomic status. These studies suggest that behaviour regulation play an important role in children's school achievement, especially in their early and mathematics performance, the focus of this study.

Gender

Arnold et al. (2002) and Doctoroff et al. (2006) called for more research that will examine gender differences in socioemotional skills and behaviour of preschool children. They pointed out that, if interventions are to be developed it is important to understand the existence of any significant differences between boys and girls because potential interventions might be effective differently. The authors noted that disruptive classroom behaviour and peer difficulties are often related to language problems of boys, for example. In their study, Doctoroff et al. (2006) found a strong link between aggression, few prosocial interactions and literacy problems in boys. Sayal et al. (2015), in a large sample of 11,640 children, found a direct negative relationship between inattention in preschool years and academic attainment at age 16 in boys as well. Further, Sanson et al. (2011) followed preschool children until the age of 9 and found that girls were better in socio-emotional adjustment in school than boys and boys' reactive temperament (e.g. quick to anger) was related to their poor socioemotional adjustment.

However, other longitudinal studies did not find any gender differences in socioemotional skills and behaviour related to children's academic achievement (e.g., Duncan et al., 2007, Arnold et al., 2012).

Preschool Education in Serbia

In Serbia, children from 6 months to 7 years of age attend early childhood education that is composed of three levels: nursery (6 months - 3 years), kindergarten (3 – 5.5 years), and compulsory preschool preparatory programme (PPP; 5.5 – 7 years). Compared with other European countries, the attendance in preschool education in Serbia is significantly lower (74% in comparison to 95% in 28 European countries; Baucal et al. 2016). Following the two wars involving Serbia (Bosnian war: 1992-1995; Kosovo war: 1998-1999), the aims of preschool education changed from a focus on cognitive development to a stronger focus on the development of socio-emotional skills, such as non-violent communication and tolerance, cultural awareness and the development of the sense of community and humanity. Parents of this post war generation are likely to have participated in one of the two wars, if not both.

There are two optional PPP programme models that differ with regards to the teacher's role, educational content, structure of the group and the degree of freedom: Model A, directed towards the whole-child approach, and Model B, cognitive-based and structured by the teacher (Klemenović 2004). In Model A, teacher supports children's intrinsically motivated activities and interaction with peers. The assessment is based on observations. Model B reinforces cognitive development and teacher-structured activities. More specifically, the focus is on language development and development of basic academic skills important for meta-cognition, planning skills and impulse control (Klemenović, 2004). There is no formal assessment in this model either.

The Present Study

Aims

In this paper we aim to explore: (1) *predictors of children's socio-emotional skills and behaviour*, and (2) *predictive power of socio-emotional skills and behaviour on mathematics and literacy performance*, and (3) *gender differences in children's socio-emotional skills and behaviour*, including 159 Serbian preschool children over the course of 14 months.

There is a small corpus of studies (Doctoroff et al. 2016; Baptista et al. 2016) that explored the reciprocal relation between mathematics and literacy performance and children's socio-emotional skills and behaviour. In Doctoroff et al.'s (2016) study, children who were rated high in socio-emotional skills performed high in mathematics. Some studies show that executive functions are important both for children's performance in mathematics but for their socio-emotional skills too. For example, Baptista et al. (2016) pointed out that executive functions are important as they prevent children from reacting too quickly. This inhibition seems to be impaired in impulsive, inattentive and hyperactive children because of slow information processing and problems with focusing (Barkley 1994; cited in Author & Author 2011). Following these studies, we propose the first hypothesis: (1) *children's mathematics performance in preschool will predict their socio-emotional skills and behaviour at entry to school*.

On the other hand, a larger corpus of studies explored the links between children's socio-emotional skills, behaviour and school performance. For example, Durlak et al. (2011) conducted a meta-analysis of 213 school-based social and emotional learning programmes in 270,034 kindergarten through high schools and discovered that children in these programmes had higher social and emotional skills, attitudes, behaviour, and academic performance compared to the control programmes. Better school achievement seems to be supported by peer and adult norms with high expectations, caring teacher-student relationship that supports

the commitment and bonding to school, engaging teaching strategies that support proactive learning, and safe and orderly environments necessary for positive classroom interactions (e.g., Blum & Libbey 2004; Hamre & Pianta 2006; cited in Durlak et al., 2011 p. 418). However, only a few studies (e.g., Doctoroff et al. 2016) explored the link between socio-emotional and mathematics skills in the preschool age. Thus, we propose the second hypothesis: (2) *children's socio-emotional skills and behaviour in preschool will predict their mathematics and literacy performance at entry to school*.

Finally, Author, Author, and Buckley (2016), using the same measures as in the present study, found that girls were rated higher than boys on socio-emotional skills and behaviour, especially in concentration and actions in the sample of 6,500 children in Scotland. Author et al. (2016), in their study in England, involving just over 1,500 children found that girls were rated higher than boys in all areas of socio-emotional skills. In a longitudinal study of nearly 5,000 preschool children in Australia, Sanson et al., (2011) found that girls were rated higher than boys in socio-emotional adjustment. Thus, we propose the third hypothesis: (3) *girls will be rated higher than boys in socio-emotional skills and behaviour throughout preschool and entry to school.*

To our knowledge, this is the first quantitative longitudinal exploration involving this under-researched population that directly responds to the urgent call for obtaining more information concerning the Serbian preschool education (Baucal et al. 2016).

Method

Participants

The selection criteria for this study included child's attendance in public preschool institutions and equal gender distribution. An educational expert from the University of Novi Sad selected eight schools corresponding to these criteria, in Vojvodina, northern Serbia. The

final sample size was determined by the availability of the test administrators, parents' consents and teachers' willingness to participate in the study.

After obtaining informed consent from parents, the study involved 159 children (M_{age} = 6 years 1 month, SD = 3 months, age range: 5.6 - 6.7 at Time 1) who were assessed on three occasions: Time 1 in October 2009, Time 2 in May 2010 and Time 3 in December 2010. Table 1 shows that there was almost an equal distribution of boys and girls. At Time 2, the sample size still included 149 children whereas at Time 3, there were 101 children. The attrition of the sample between Time 1 and Time 3 was 37%. Furthermore, comparisons of background variables showed that that the attrited sample did not differ from the participants by gender (p = .951). On the other hand, there were significant differences between the attrited and the final sample concerning the ethnic minority status and parental education (p < .010).

Regarding the ethnic minority children, there were 69% of Serbian, 16% of Roma, 8% of Hungarian and 7% of other minority children in the initial sample. The attrited sample was composed of 58% of Serbian, 33% of Romani, 4% of Hungarian and 5% of other ethnic minority children. Most of the ethnic minority children changed their schools and it was difficult to track them all. The final sample thus included 77% of Serbian children.

With respect to parental education, in the total sample, 6% of mothers and 10% of fathers had finished primary school (consisting of eight grades from age 7 to age 15), 58% of mothers and 67% of fathers had finished secondary school (from age 15 to 19) and 23% of mothers and 13% of fathers had an undergraduate or postgraduate degree. The attrited sample contained more mothers and fathers with finished primary school only (15% of mothers with primary school in attrited compared to 3% in the final sample; 24% of fathers compared to 4%). The final sample thus included children whose parents had finished high school (68% of mothers and 74% of fathers) and University (29% of mothers and 22% of fathers). In addition,

the final sample had equal gender distribution and included middle class Serbian children. As such it reflects the national sample profile (Klemenović, 2004).

Furthermore, there were no missing data for mathematics and literacy at Time 1. For socio-emotional skills and behaviour, there were missing data only for one child. Therefore, the data from Time 1 were balanced and complete. Regarding the outcomes, there was only 5% (N = 5) of uncomplete data in socio-emotional skills and behaviour. Mathematics contained complete data whereas literacy had missing answers from 3 children (3%).

Measures

Personal, Social and Emotional Development Scale (PSED). This 11-item scale (Author et al. 2000) includes teachers' ratings based on observation in the school setting. It covers 11 different areas of development that are grouped into three domains: *adjustment to school setting, personal skills* and *social skills*. *Adjustment* domain covers: (1) being comfortable and (2) independent. The *personal skills* domain is composed of: (3) confidence, (4) concentration on teachers directed activities, (5) concentration on self-directed activities and (6) consideration of consequences of child's actions. The third domain of *social skills* is defined by: (7) relationship to peers, (8) relationships with adults, (9) rules, (10) cultural awareness, and (11) non-verbal and verbal communication (Author et al. 2016; see Table 3).

Each area was judged on a 5-point scale and each point on the scale was accompanied by a descriptor. Bailey and Author (2016) reported high reliability of 0.92 with 1162 children in England. They looked at the validity of the scale as the sample involved 68% of children whose first language was not English. The item analysis showed that the scale was appropriate for the use with children with diverse language and cultural background with the exception of Item 11, communication. Author et al. (2016) reported high reliabilities (0.91) with large samples (over 1000) in England, Scotland, New Zealand and Australia.

The scale was translated in Serbian and proofread by the native speakers; due to resource limitations, no back translation was possible. Cronbach's alpha for this scale was high: 0.94 for Time 1, and 0.90 and 0.93 for Times 2 and 3. Reliabilities of the individual scales and intercorrelations between the measurement times are presented in Table 2.

The Behavior Rating Scale (BRS). Measurements concerning the child's behavior were assessed by the standardized Behavior Rating Scale (Author et al. 2000) which has been modified for children by the Centre for Evaluation and Measurement at Durham University from the DSM-IV (American Psychiatric Association, 1994). This nine-point scale, with response options ranging from 1 (*never*) to 9 (*always*), completed by the teachers, is based on the 18 criteria for the diagnosis of ADHD (attention deficit hyperactivity disorder) in DSM-IV (Diagnostic and Statistical Manual of Mental Disorders). It consists of 21 items. The criteria in the Behavior Rating Scale were grouped into subscales of the same ADHD subtypes as in the DSM-IV. These subscales were: (a) *inattention* (e.g., 'does not seem to listen when spoken to directly'; 7 items), (b) *hyperactivity* (e.g., 'fidgets with hand or feet or squirms in seat'; 5 items) and (c) *impulsivity* (e.g., 'interrupts or intrudes on others'; 9 items). There were three additional items ('a child daydreams', 'responds before considering consequences' and 'thinks aloud'; Author and Bailey 2008; see Table 3).

The BRS scale was translated into Serbian and proofread by the native speakers. Two professional translators actively participated in the process. Both have been involved in the educational sector. Furthermore, based on the exhaustive discussions with the University professors, one of which was expert in cultural psychology, and teachers, we changed some behavioural descriptions to fit these more to the Serbian context which is motivated by the notion that the perception of behaviour is culturally embedded. For example, 'talks excessively' might be an indicator for hyperactivity in one culture but not in another. Similarly, 'interrupts others' might be seen as negative in one culture but positive in another

(in the sense that a child wants to maintain her place in the larger group of children, for example). The item such as *Is often 'on the go' as if driven by a motor* was differently translated in Serbian but kept the meaning of the behaviour intact (e.g., *Često je 'na juriš' kao da je na struju*; literal translation: *Is often 'on the go' as if driven by the electricity*). Cronbach's alpha for this scale was very high for all three measurement times: 0.98. Reliabilities of the individual scales and intercorrelations between the measurement times are presented in Table 2.

The Performance Indicators in Primary Schools (PIPS). This assesses children's early literacy and mathematics (PIPS; Author 1999). PIPS provides a baseline of a child's present level of cognitive performance that can be used for further monitoring. PIPS has been used internationally with large samples and has a high reliability (0.93) and a test-retest reliability (0.98; Author et al. 2014). It can be administered in 20 minutes per child. It was translated, back translated, and adapted with the help of native speakers and professional translators.

Table 3 gives an overview of the 12 content areas that are covered by the PIPS. For the purpose of this study and taking into consideration specificities of the Serbian school system we added sections in literacy and mathematics for the second measurement and the third measurement, such as Reading stories and Sentences both in Cyrillic and Latin scripts (285 items/Time 2 and 305 items/Time 3) and mathematics problems (58 items/Time 2 and 66 items/Time 3). Thus, the administration of the PIPS test took about 30 min.

The test was adaptive: in case the child attained 80% or more correct answers, additional and more difficult sections were presented. Cronbach's alpha was α_{T1} = .78, α_{T2} = .79 and α_{T3} = .76. Intercorrelations were $r_{1,2}$ = .84 between the first and the second, and $r_{1,3}$ = .72 between the first and the third measurement time.

Procedure

After a training session, teachers were asked to rate children's socio-emotional skills and behaviour including impulsivity, inattention and hyperactivity at three times. The scales were the same for all three time points. The teachers were the same for Times 1 and 2. The time between the first and the second and the second and the third assessment was 8 months. There were new teachers at Time 3 as children entered primary school and left PPP. Nevertheless, teachers rated children after 4 months after their entry to school which allowed them enough time to get to know children.

All children were assessed individually in literacy and mathematics at three measurement occasions over the course of 14 months. The test administrators were trained school counsellors, teachers and University assistants. The assessment was in a form of a booklet which included instructions for the administrator and questions and coloured pictures for the children. At Times 2 and 3 the children were not assessed in sections where they had achieved more than 80% of the correct answers at Time 1.

Results

To test the first two hypotheses, multiple regression was used in order to explore the significant predictors (Time 1: start of preschool) of outcomes (Time 3: entry to school) controlling for outcome's Time 2 (end of preschool) scores. Means, standard deviations, correlations and reliabilities of all variables considered here are presented in Table 2 for all three measurement times. For all regression analyses we tested the assumptions for independent errors, normal distribution of errors as well as multicollinearity. Finally, to test the third hypothesis and find out about gender differences we conducted analysis of variance.

Predictors of Socio-Emotional Skills and Behaviour

Regression analysis was conducted with socio-emotional skills and behaviour as outcome measures at Time 3 and predictors and control variables taken from Times 1 and 2.

The predictors were taken from Time 1 when the children entered their preparatory preschool year. The outcome was at Time 3, when children entered the first grade of school. Each outcome was controlled by its scores from Time 2.

Step 1 included the predictor that had the strongest correlation with the outcome. With this approach we gained information about how much variance this single predictor explained in the outcome. Step 2 firstly included the children's background variables (gender and maternal education) and then theoretically relevant predictors. Children's age was not significantly correlated with the outcomes. Although children's ethnic origin did we excluded this variable because the attrition analysis showed that the final sample was composed of 77% of Serbian children and that the attrited sample included more language minority children. Regarding father's education, we excluded this variable as well because the attrited sample was, among other children, composed of Romani whose fathers finished primary school only (93% of Romani fathers). Thus, we included maternal education that was more descriptive of the final sample.

The data met the assumption of independent errors (*Durbin-Watson value* = 1.53) and multicollinearity was not found (*VIF* = 1.74). The significant variables were gender (β = .39, p < .050; 95% CI [.06, .72]), mathematics at Time 1 (β = .61, p < .001; 95% CI [.35, .87]), and socio-emotional skills at Time 2 (β = .35, p < .001; 95% CI [.15, .54]), controlling for maternal education and literacy at Time 1. Gender, mathematics at Time 1 and socio-emotional skills at Time 2 explained 45% of the socio-emotional skills variance at Time 3 (R^2 = .45, F(5,86) = 13.83, p < .001). Mathematics as the strongest predictor explained 35% (R^2 = .35, F(1,95) = 50.87, p < .001; see Table 4).

Regarding children's behaviour from Time 3 the significant variables were, in this case as well, gender (β = -.40, p < .050; 95% CI [-.73, -.08]), mathematics at Time 1 (β = -.37, p < .010; 95% CI [-.62, -.12]) and behaviour at Time 2 (β = .56, p < .001; 95% CI [.37, .75]),

explaining 53% of the variance (R^2 = .53, F(5,79) = 17.45, p < .001), after controlling for maternal education and literacy at Time 1. Behaviour at Time 2 as the strongest predictor explained 46% (R^2 = .46, F(1,86) = 73.67, p < .001; Table 4).

Socio-Emotional Skills and Behaviour as Predictors of Early Mathematics and Literacy

Predictors of mathematics. Neither composite PSED nor Behaviour from Time 1 were found to be significant predictors of mathematics at Time 3. This led us to explore single PSED and Behaviour skills as it was proposed in previous studies (e.g., Duncan et al. 2007; attention and mathematics). The separate skills were: adjustment, personal and social skills (PSED), impulsivity, inattention and hyperactivity (Behaviour). However, those skills were not significant either. The only predictor for mathematics at Time 3 was mathematics at Time 2 (β = .81, p < .001; 95% CI [.63, .99]) explaining 62% of variance (R^2 = .62, F(5,90) = 29.15, p < .001; Table 4) controlling for gender, maternal education, literacy and behaviour at Time 1.

Predictors of literacy. Further, we explored the predictors of early literacy at Time 3. In this analysis, significant predictors were mathematics at Time 1 (β = .44, p < .050; 95% CI [.11, .78]), literacy at Time 2 (β = .32, p < .010; 95% CI [.12, .52]) and social skills at Time 1 (β = .29, p < .050; 95% CI [.09, .57]), controlling for gender and maternal education. Social skills were the only socio-emotional and behavioural predictor that was significant. The composite PSED and Behaviour at Time 1 were not significant. Thus, mathematics at Time 1, literacy at Time 2 and social skills at Time 1 explained 60% of the early literacy variance at Time 3 (R^2 = .66, F(5,47) = 14.11, p < .001). Mathematics as the strongest predictor explained 44% (R^2 = .44, F(1,56) = 43.74, p < .001; see Table 4).

Gender

Analysis of variance showed that there were significant gender differences at all three measurement times where girls were rated more positively than boys. This was true for all the

PSED and BRS subscales except for the PSED subscale on adjustment to school setting at all three times and BRS subscale impulsivity at Time 2 only.

Regarding children's socio-emotional skills there were no significant gender differences in adjustment at Time 1 ($F(1,155) = 3.39$, $p = .067$), at Time 2 ($F(1,147) = 2.21$, $p = .139$), and at Time 3 ($F(1,95) = 1.49$, $p = .225$). However, there were significant gender differences in personal skills at Time 1 ($F(1,155) = 9.94$, $p < .010$), at Time 2 ($F(1,146) = 13.47$, $p < .010$), and at Time 3 ($F(1,95) = 8.23$, $p < .010$), and in social skills at Time 1 ($F(1,156) = 13.30$, $p < .010$), at Time 2 ($F(1,147) = 17.96$, $p < .010$), and at Time 3 ($F(1,94) = 5.93$, $p < .050$).

Regarding children's behaviour, there were significant gender differences in inattention at Time 1 ($F(1,156) = 11.04$, $p < .010$), at Time 2 ($F(1,145) = 14.78$, $p < .010$), and at Time 3 ($F(1,94) = 17.22$, $p < .010$). Further we found significant gender differences in hyperactivity at Time 1 ($F(1,156) = 21.05$, $p < .010$), at Time 2 ($F(1,146) = 13.12$, $p < .010$), and at Time 3 ($F(1,95) = 8.23$, $p < .010$). Finally, there were significant gender differences in impulsivity at Time 1 ($F(1,156) = 9.24$, $p < .010$) and at Time 3 ($F(1,90) = 12.56$, $p < .010$) but not at Time 2 ($F(1,145) = 3.53$, $p = .062$).

General Discussion

In this paper we explored the links between socio-emotional skills, behaviour and literacy and mathematics performance of preschool children in Serbia over the course of 14 months. Teachers rated 159 children aged 5-8 by Personal, social and emotional development scale, and Behaviour rating scale on inattention, hyperactivity and impulsivity. These scales were included in the Performance Indicators in Primary School (PIPS; Author 1999), an adaptive test that measures early literacy and mathematics.

Hypothesis 1. We expected that children's mathematics performance in preschool will predict their socio-emotional skills and behaviour at entry to school. For children's socio-

emotional skills at Time 3, the results showed that gender, mathematics at Time 1 and socio-emotional skills at Time 2 were the most significant predictors, controlling for maternal education and literacy at Time 1. The strongest predictor was mathematics.

Mathematics and preschool children's social skills are closely related which is supported by other studies (e.g., Fantuzzo et al. 2007; Hidman et al. 2010). Children's cognitive skills in preschool contribute to their teacher and peer relationships, classroom participation and academic achievement (Ladd et al., 1999). More specifically, Dobbs et al. (2006) found that their pure academic intervention in preschool children's mathematic performance significantly improved their social skills. Further, Crosnoe et al. (2010), in a comprehensive longitudinal study that followed children from birth to fifth grade, found that children who performed low in mathematics progressed faster in classroom with high teacher-student relations than their peers. Doctoroff et al. (2016) noted that children who were rated high in socio-emotional skills performed higher in mathematics. They also pointed out that there is a reciprocal relationship as well, children's interest in learning and engagement can positively influence their socio-emotional skills. Socio-emotional and behavioural problems can lead to lower academic achievement but academic difficulties can also lead to increased frustration, lower engagement, poorer self-esteem and aggression (Arnold et al. 2012).

For children's behaviour, the predictors were the same as for children socio-emotional skills: gender, mathematics at Time 1 and behaviour at Time 2 which was the strongest predictor, controlling for maternal education. Several studies found that the relation between mathematics and children's behaviour is underlined by executive functions: attentional focusing, working memory, and inhibitory control (e.g., Author et al. 2017; Duncan et al. 2007; Lonigan et al. 1999; McClelland et al. 2007). Children need to focus on instruction and commands, use working memory to remember and execute new rules and inhibit automatic responding (Ponitz et al., 2009). They need to learn how to follow routines, concentrate and

participate in new activities while managing relations with the teachers and their peers (Denham et al. 2014). However, the strongest predictor for children's behaviour at Time 3, entry to school, was their behaviour at Time 2, end of preschool. This is interesting since children were rated by two different teachers, first in preschool and then at entry to school. This link gives us information about stability of children's ratings.

To conclude, our first hypothesis was confirmed: *children's mathematics performance in preschool predicted their socio-emotional skills and behaviour at entry to school*.

Hypothesis 2. To test this hypothesis, we explored whether children's socio-emotional skills and behaviour in preschool will predict their mathematics and literacy performance at entry to school.

For *mathematics*, none of the socio-emotional skills nor specific behaviour was significant. The only significant predictor, in the final regression equation, was children's math performance at Time 2, controlling for gender, maternal education, literacy and behaviour. It seems that cognitive link to mathematics was stronger than any other. Other large longitudinal studies did not find any link between socio-emotional skills and academic achievement. Duncan et al., (2007), for example, in six longitudinal data sets, found no significant links between socio-emotional skills and mathematics and literacy. Further, Doctoroff et al (2016) noted that children's socio-emotional skills were not related to their math-specific interest.

Contrary to other studies (e.g., Author and Author 2001; Author et al. 2017; Duncan et al. 2007, Lonigan et al. 1999; Rabiner et al. 2016, Ponitz et al., 2009) we found no specific behaviour that predicted children's mathematics performance; inattention was not significant either. On the other hand, Duncan et al. (2007) found that early mathematics skills were the most predictive of children's academic achievement (literacy and mathematics) which supports the present study. The fact that mathematics from the end of preschool was the most

predictive for children's mathematics at entry to school informs us about the strong cognitive processes that are important for entry to school. Both in literacy and mathematics, children passed the decoding stage of identifying letters and numbers in preschool and moved to more complex cognitive skills that involve reading comprehension and calculating at entry to school. Since the entry of school puts a specific focus on these skills, it is expected that decoding skills (mathematics at Time 1) were the most predictive.

Furthermore, *literacy* performance was predicted by mathematics (the strongest predictor), literacy at Time 2 and social skills at Time 1, controlling for gender and maternal education. Social skills were the only socio-emotional skill that predicted literacy. These skills were composed of relationships with peers, relationships with teachers, awareness of rules, cultural awareness and communication. This finding is in line with other studies that found that children asking for help from teachers, have positive peer and teacher interactions profit more academically (e.g., Denham 2006; Valiente et al. 2008; Torres et al. 2015). In classroom, children have the opportunity to express themselves verbally which is important for their confidence and developing relationships with their peers and teachers (Sarama et al., 2012).

We did not find any specific behavior that was related to literacy. Ponitz et al. (2009) pointed out that behavior did not contributed to literacy as it did for mathematics, because the cognitive processes necessary for reading become more automatic than for mathematics probably due to more print exposure at home and language instruction at school (Connor et al. 2006; Miller et al. 2005; NICHD ECCRN. 2002; cited in Ponitz et al. 2009).

Furthermore, studies supported strong relations between literacy and mathematics since letters and numbers share notational and symbolic properties (decoding letters and numbers) and they are combined according to a set of rules (reading and calculating; e.g., Bialystok 2001; Duncan et al. 2007). Sarama et al. (2012), for example, found that early

mathematics intervention improved children's oral language skills. Literacy at Time 2 was as well predictive of literacy at Time 2, which follows children's early literacy development from decoding to reading comprehension. These findings are however tentative due to the small sample size (N = 56).

Finally, hypothesis 2 was partly confirmed, *social skills predicted literacy but not mathematics performance*. Children's behaviour was not predictive.

Hypothesis 3. In line with our hypothesis, we found that *girls were rated more positively than boys* over 14 months which is supported by other studies (e.g., Author et al. 2016; Doctoroff et al. 2006; Sanson et al. 2011; Sayal et al. 2016). This hypothesis was confirmed with the exception of one skill where we did not find any differences across all three measurement times. This was adjustment to school settings. It may be due to the fact that this scale had only two items and it was less discriminative than other scales.

Limitations of the Study

As emphasized, the attrition of the sample limits the findings. Furthermore, more elaborated tests on PSED should be included. Children need to have the opportunity to show certain skills: a child who can regulate emotions might feel better after being pushed but still has to decide how to act. This is why observation is necessary (Denham 2006). Next, the scales in the study did not include internalized behaviours such as withdrawal or anxiety often related to the "invisible girl" phenomenon where academic problems that girls have might go unnoticed (Arnold et al. 2012). Further, investigating children's executive functions, attention, working memory and inhibitory control, is equally important (e.g., Baptista et al. 2016; Ponitz et al. 2009).

Moreover, the data interpretation in the study is based on correlations. However, Baily et al. (2018) pointed out that research exploring early mathematics, literacy and socio-emotional skills should include 'unmeasured persistent factors' in regression models as often

as possible particularly focusing on domain-general cognitive abilities, personality, and environmental affordances. The authors are not pessimistic about correlational data as they can help triangulate 'theories that can accurately predict when the effect s of academic interventions will fade out or persist' (p. 92).

Next, teachers' values, attitudes and expectations in a particular educational context need to be explored as well. Some authors (e.g., Doctoroff et al., 2006) pointed out that teachers rate and react differently to boys and girls; teachers tend to disproportionally diagnose boys with learning and behavioural difficulties and girls with prosocial behaviour. In addition, children who enter classroom with less academic preparation might experience distress and frustration if they are pushed by teachers to develop higher order skills (Crosnoe et al. 2010).

Further, Haun and Tomasello (2011), in their experimental study, showed that children as young as 4 years of age are not only subject to the influence of adults mostly out of fear and respect but they are subject to peer pressure as well in which they can display high conformity. This in turn influences their behaviour and learning. In addition, in this study it would have been useful to explore possible differences between children's participation in Model A (whole-child approach) and Model B (cognitive-based) programmes, however the group were unbalanced for comparisons.

Finally, Berger et al. (2011) underlined that socio-emotional skills need to be explored in interactions between the child and her social context. Therefore, other important variables to be explored are family environment (e.g., Sanson et al. 2011) and school climate (e.g., Yan et al. 2016).

Future Steps

The present study provides the first insight into the links between socio-emotional skills, behaviour, and early literacy and mathematics of preschool children in Serbia. Large

longitudinal studies in other countries, predominantly in the US, have found strong relations between children's socio-emotional skills, behaviour regulation and their academic achievement from preschool to young adulthood. Thus, we call for further research that will longitudinally follow larger samples of preschool children in Serbia. More information will contribute to the development and evaluation of potential interventions for children with socio-emotional and behavioural difficulties that will help children's academic achievement. These relations seem to be reciprocal; thus, it is important to explore them in children's critical preschool years. As to our knowledge no study in Serbia has explored this before, the call for future studies becomes urgent.

More specifically, future research is needed to explore the links between mathematics and socio-emotional skills and behaviour. This relationship seems to be bi-directional and it is necessary to investigate the mechanisms of how exactly mathematics influence socio-emotional skills and behaviour, as it has been discovered in a very few studies.

Practical Implications and Significance

Today's schools have increased rate of culturally diverse students with different abilities and motivations; therefore, socio-emotional skills become crucial for their school adjustment and success. Regarding Serbia, the attendance in preschool education is significantly lower than in 28 European countries (Baucal et al. 2016). Even though Serbian preschool education already puts an accent on socio-emotional and behavioural development, it is necessary to invest in more research in this domain. More information about preschool education will help further monitoring, evaluation and inclusion of more children. As noted in the OECD (2015) report, socio-emotional development continues through late childhood and adolescence which gives a space for intervention programmes that can help reduce social inequalities among children.

Ethics Approval. All procedures in studies involving human participants were in accordance with the ethical standards of the University of Luxembourg and University of Novi Sad and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. For this type of study formal consent is not required. This is a retrospective study.

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Table 1

Sample Characteristics of Participants on Three Measurement Occasions

Demographic Data	*Time 1 (N = 159)*	*Time 2 (N = 149)*	*Time 3 (N = 101)*
Gender			
Male	49%	50%	48%
Female	51%	50%	52%
Mother tongue			
Serbian	69%	67%	48%
Roma	16%	13%	7%
Hungarian	8%	8%	5%
Other[a]	7%	1%	4%
Attrition	0%	11%	36%
Mean age	6 years 1 month (*SD* = 3 months)	6 years 7 months (*SD* = 3 months)	7 years 3 months (*SD* = 3 months)
Education Mother			
Primary school	6%	6%	6%
Secondary school	58%	58%	58%
University and above	23%	23%	23%
Education Father			
Primary school	10%	10%	10%
Secondary school	67%	67%	67%
University and above	13%	13%	13%
Number of schools	8	8	8
Number of classes	9	9	9

[a] Other languages included German, Slovak, Persian, Croatian, English, and Arabic.

Table 2. *PSED and Behaviour: Correlations, Means, Standard Deviations and Reliabilities across Three Measurement Occasions*

Measures	Age	Gender	Ethnic	Edu M	Edu F	Read1	Read2	Read3	Math1	Math2	Math3	**Mean**	**SD**	**Alpha**	***Corr.***
PSED T1															
Adjustment	.11	.15	**-.25**	***.18***	**.31**	**.35**	**.23**	.11	**.51**	**.39**	**.28**	8.56	1.72	0.79	--
Personal	.14	**.25**	-.12	**.32**	**.28**	**.49**	**.33**	**.32**	**.49**	**.36**	**.27**	14.84	3.77	0.86	--
Social	**.23**	**.28**	**-.41**	**.33**	**.27**	**.49**	**.34**	**.59**	**.53**	**.49**	**.44**	19.30	5.20	0.90	--
Total	**.21**	**.28**	**-.33**	**.37**	**.34**	**.55**	**.38**	**.50**	**.60**	**.50**	**.42**	42.65	9.23	0.94	--
PSED T2															
Adjustment	**.17**	.12	**-.31**	**.23**	**.28**	**.41**	**.29**	.10	**.45**	**.40**	**.29**	9.26	1.15	0.50	$r_{1,2}$=.42
Personal	.13	**.29**	-.16	**.35**	***.22***	**.56**	**.43**	**.57**	**.56**	**.55**	**.38**	12.59	2.45	0.83	$r_{1,2}$=.62
Social	.10	**.33**	***-.18***	**.41**	**.31**	**.45**	**.37**	.24	**.43**	**.34**	**.29**	25.87	4.27	0.88	$r_{1,2}$=.44
Total	.13	**.32**	-.23	**.41**	**.32**	**.55**	**.43**	**.39**	**.56**	**.47**	**.36**	47.68	6.91	0.90	$r_{1,2}$=.61
PSED T3															
Adjustment	.18	.12	-.09	-.03	.12	***.22***	**.25**	.24	**.42**	**.40**	**.26**	8.86	1.37	0.67	$r_{1,3}$=.45
Personal	.18	**.28**	**-.29**	**.24**	**.35**	**.48**	**.40**	**.63**	**.62**	**.59**	**.52**	11.85	2.84	0.86	$r_{1,3}$=.45
Social	.20	***.24***	***-.24***	***.23***	**.34**	**.35**	**.26**	**.44**	**.51**	**.48**	**.47**	25.09	4.55	0.90	$r_{1,3}$=.55
Total	.17	**.28**	***-.23***	***.22***	**.28**	**.40**	**.34**	**.53**	**.59**	**.54**	**.49**	45.54	8.24	0.93	$r_{1,3}$=.65
BRS T1															
Inattention	-.15	**-.26**	**.24**	**-.34**	**-.30**	**-.48**	**-.31**	**-.34**	**-.52**	**-.41**	**-.37**	20.95	15.71	0.97	--
Hyperactivity	-.11	**-.35**	***.17***	**-.24**	***-.19***	**-.33**	**-.28**	**-.38**	**-.34**	**-.29**	**-.28**	14.31	11.82	0.97	--
Impulsivity	-.04	**-.24**	***.17***	**-.24**	***-.19***	**-.28**	***-.18***	**-.27**	**-.36**	**-.27**	**-.31**	14.36	10.57	0.89	--
Total	-.11	**-.29**	***.21***	**-.30**	**-.25**	**-.40**	**-.28**	**-.36**	**-.44**	**-.36**	**-.35**	49.62	36.17	0.98	--
BRS T2															
Inattention	-.11	**-.30**	**.25**	**-.30**	**-.25**	**-.47**	**-.35**	**-.52**	**-.50**	**-.50**	**-.35**	18.26	14.31	0.97	$r_{1,2}$=.69
Hyperactivity	-.06	**-.29**	**.26**	**-.28**	**-.28**	**-.38**	**-.31**	**-.43**	**-.40**	**-.41**	**-.37**	14.48	11.43	0.95	$r_{1,2}$=.77
Impulsivity	-.04	-.15	**.27**	**-.25**	**-.26**	**-.29**	***-.21***	**-.35**	**-.35**	**-.29**	**-.26**	10.90	8.26	0.88	$r_{1,2}$=.69
Total	-.07	**-.29**	**.27**	**-.30**	**-.27**	**-.42**	**-.32**	**-.50**	**-.45**	**-.44**	**-.35**	43.65	31.63	0.98	$r_{1,2}$=.76
BRS T3															
Inattention	-.11	**-.30**	**.25**	**-.30**	**-.25**	**-.47**	**-.35**	**-.52**	**-.50**	**-.50**	**-.35**	18.26	14.31	0.97	$r_{1,3}$=.69
Hyperactivity	-.19	**-.45**	.16	-.09	-.17	***-.26***	***-.26***	**-.48**	**-.35**	**-.30**	**-.34**	16.68	12.24	0.96	$r_{1,3}$=.68
Impulsivity	-.14	**-.35**	.18	-.09	-.15	***-.26***	***-.29***	**-.53**	**-.31**	**-.24**	**-.28**	12.93	8.87	0.92	$r_{1,3}$=.50
Total	-.14	**-.44**	***.21***	-.14	***-.24***	**-.32**	**-.31**	**-.63**	**-.48**	**-.44**	**-.44**	49.98	34.12	0.98	$r_{1,3}$=.68
Descriptives															
Mean	6.15	--	--	--	--	22.76	112.98	348.36	27.99	42.42	63.93	--	--	--	--
SD	.30	--	--	--	--	21.65	132.31	117.56	9.14	11.54	14.68	--	--	--	--
Reliability		--	--	--	--	.84	.80	.72	.73	.35	.67	--	--	--	--

Note. Correlations reaching significance at .05 level are indicated in bold italics. Correlations reaching significance at .01 level are indicated in bold. Edu M = Education mother,

Edu F = Education father, PSED = Personal, social, and emotional development at Time 1, 2, and 3, BRS = Behavior at Time 1, 2, and 3. Corr. = Correlations between Times 1 and 2, and 1 and 3.

Table 3

Contents of the PSED Scale, the BRS Scale and the PIPS Test (Author & Bailey, 2008; Author, Author, & Buckley, 2016, pp. 16-17)

The PSED Scale	
Section	*Description or sample question*
Adjustment to the school setting	Comfortable – Is the child comfortable upon separation from main carer at the start of the day and do they cope easily with transitions within the school day?
	Independence – Level of support and guidance needed for personal care and activities
Personal	Confidence
	Concentration on self-directed activities
	Concentration of teacher-directed activities
	Actions – Consideration of others
Social	Relationship to peers
	Relationship with adults
	Rules – takes notice of rules
	Cultural awareness
	Communication
The BRS Scale	
Inattention	Does not seem to listen when spoken to directly. Is easily distracted by extraneous stimuli. Is forgetful in daily activities.
Hyperactivity	Fidgets with hand or feet or squirms in seat. Is "on the go" or often acts as if "driven by a motor". Talks excessively.
Impulsivity	Has difficulty awaiting turn. Interrupts or intrudes on others.
The PIPS Test	
Writing	Writing – the child is asked to write his/her own name and the quality of writing is scored against examples
Vocabulary	Vocabulary – the child is asked to identify objects embedded within a picture

Ideas About Reading	Ideas about reading – assesses many of the ideas found in Marie Clay's Concepts about Print (Clay 1972) *Can you show me someone who is writing?*
Phonological awareness	Repeating Words – the child hears a word and is asked to repeat it *Can you say 'riotous'?* Rhyming Words – the child selects a word to rhyme with a target word from a choice of three options *Cat with hat, head, or ring*
Letters	Letter identification – a fixed order of mixed upper and lower case letters
Early Reading	Word recognition and reading This starts with word recognition and moves on to simple sentences that the child is asked to read aloud. The words within these sentences are high frequency and common to most reading schemes. This is followed by two more difficult comprehension exercises called 'Walking to school' and 'Cats' which require the child to read a passage and at certain points select one word from a choice of three best fits that position in the sentence
Ideas about Mathematics	Ideas about mathematics – assessment of understanding of the vocabulary associated with mathematical concepts
Counting	Counting and numerosity – the child is asked to count four objects. These disappear and then the child is asked how many object they saw. This is repeated with seven objects. *How many fish are there?* Then: *How many fish did you see?*
Digits	Digit identification – single, two-digits and three-digits *What is this number?*
Number	Number manipulation – the child is asked how many more or less a number is than a target
Sums A	(Informal) Sums – addition and subtraction problems presented without symbols *Here are three balls. If I took one away, how many would be left?*
Sums B	(Formal) More difficult mathematics problems including sums presented with formal notion

Table 4

Regression for Socio-Emotional Skills, Behaviour, Early Mathematics and Early Literacy at Time 3

Socio-Emotional Skills T3					
	B	***SE B***	***β***	***95% CI***	***Sig.***
Step 1					
Constant	-0.15	0.09			
Mathematics T1	**0.63***	**0.09**	**.59**	**[.46, .81]**	***p* < .050**
Step 2					
Constant	-0.10	0.41			
Gender	**0.39***	**0.17**	**0.21**	**[.06, .72]**	***p* < .050**
Mother education	-0.10	0.18	-0.05	[-.45, .25]	*p* = .579
Literacy T1	-0.22	0.12	-0.23	[-.46, .02]	*p* = .068
Mathematics T1	**0.61***	**0.13**	**0.57**	**[.35, .87]**	***p* < .001**
PSED T2	**0.35***	**0.10**	**0.34**	**[.14, .54]**	***p* < .001**
R^2 = .35* for Step 1, ΔR^2 = .45* for Step 2 (p < .001). * p < .001, N = 97					
Behaviour T3					
	B	***SE B***	***β***	***95% CI***	***Sig.***
Step 1					
Constant	0.12	0.09			
Behaviour T2	**0.70***	**0.08**	**.68**	**[.54, .87]**	***p* < .001**
Step 2					
Constant	0.06	0.38			
Gender	**-0.40***	**0.16**	**-0.22**	**[-.73, -.07]**	***p* < .050**
Mother education	0.10	0.17	0.06	[-.23, .44]	*p* = 531
Mathematics T1	**-0.37***	**0.13**	**-0.35**	**[-.62, -.12]**	***p* < .010**
Literacy T1	0.61	0.12	0.13	[-.11, .35]	*p* = .314
Behaviour T2	**0.56***	**0.10**	**0.52**	**[.37, .75]**	***p* < .001**
R^2 = .41* for Step 1, ΔR^2 = .53* for Step 2 (p < .001). * p < .001, N = 88					
Mathematics T3					
	B	***SE B***	***β***	***95% CI***	***Sig.***
Step 1					
Constant	-0.23	0.06			
Mathematics T2	**0.89***	**0.07**	**.79**	**[.75, 1.03]**	***p* < .001**

Step 2					
Constant	-0.14	0.33			
Gender	-0.13	0.14	0.12	[-.40, .52]	p = .334
Mother education	-0.03	0.15	-0.02	[-.29, .29]	p = .984
Literacy T1	0.09	0.09	0.10	[-.08, .26]	p = .286
Behaviour T1	-0.04	0.09	0.21	[-.21, .13]	p = .668
Mathematics T2	**0.81***	**0.09**	**0.72**	**[.63, .99]**	**p < .001**
R^2 = 63.* for Step 1, ΔR^2 = .62* for Step 2 (p < .001). * p < .001, N = 99					
Literacy T3					
	B	***SE B***	***β***	***95% CI***	***Sig.***
Step 1					
Constant	-0.41	0.12			
Mathematics T1	**0.75***	**0.11**	**.66**	**[.52, .98]**	**p < .001**
Step 2					
Constant	0.19	0.46			
Gender	0.19	0.23	0.10	[-.27, .65]	p = .418
Mother education	-0.35	0.19	-0.18	[-.74, .04]	p = .076
Mathematics T1	**0.44***	**0.17**	**0.36**	**[.11, .78]**	**p < .050**
Literacy T2	**0.32***	**0.10**	**0.37**	**[.12, .52]**	**p < .010**
Social skills T1	**0.29***	**0.14**	**0.27**	**[.09, .57]**	**p < .050**
R^2 = .44* for Step 1, ΔR^2 = .60* for Step 2 (p < .001). * p < .001, N = 58					