Home environment as a predictor of child's language: A mediating role of family literacy activities and symbolic play

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Abstract: In our study, we explored the ways in which SES-related factors of family environment affect child's language across toddlerhood and early childhood. We proposed a mediational path model in which we presumed that family literacy activities and parental encouragement of symbolic play acted as mediating variables, mediating the effect of parental education, family possessions and parent-to-child speech on child's language. The sample included 99 families with children, aged from 1 to 6 years. The data were collected in the family home, mostly via direct observation and by using a semi-structured interview with parents. The findings suggest that high-SES parents and parents who used a more complex and supportive speech, more frequently involved their children in different literacy activities. The effect of the parent-to-child speech on child's language proved to be mediated by parental use of mental transformations during symbolic play with a child.

Keywords: family literacy, parental education, language development, parent-to-child speech, symbolic play

Družinsko okolje kot napovednik otrokovega govora: mediacijska vloga literarnih dejavnosti in simbolne igre

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Povzetek: V predstavljeni raziskavi smo preučevali poti, preko katerih dejavniki družinskega okolja, povezani s SES-om družine, vplivajo na otrokov govor v obdobjih malčka in zgodnjega otroštva. Oblikovali smo mediacijski model poti, v katerem smo predvideli, da literarne dejavnosti v družini in spodbujanje simbolne igre predstavljajo mediacijske spremenljivke, ki posredujejo med učinkom izobrazbe staršev, družinskega imetja in govora staršev na otrokov govor. V vzorec je bilo vključenih 99 družin z otroki, starimi od 1 do 6 let. Podatke smo zbrali v družinah otrok, predvsem preko neposrednega opazovanja ter z uporabo polstrukturiranega pogovora s starši. Dobljeni rezultati so pokazali, da starši z visokim SES-om ter starši, ki rabijo bolj zapleten in spodbuden govor, svoje otroke pogosteje vključujejo v različne literarne dejavnosti. Ugotovili smo, da je med starševim in otrokovim govorom posredovala starševa uporaba miselnih pretvorb v simbolni igri z otrokom.

Ključne besede: družinska pismenost, izobrazba staršev, jezikovni razvoj, govor starša otroku, simbolna igra

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One of the most frequently studied factors of family environment, in connection to child's development and learning, is the socio-economic status (SES) of the family. Traditional SES measures, including family income, parental education and occupation, have been proved to be linked to socioemotional, behavioural, cognitive and language development of children across different developmental periods (Raviv, Kessenich, & Morrison, 2004). SES has been established to be an increasingly important predictor of children's cognitive abilities already in toddlerhood, when the ability of symbolic thinking develops, and remains a significant predictor of both intellectual abilities as well as language competence and literacy throughout childhood and adolescence (Gottfried, Gottfried, Bathurst, Wright Guerin, & Parramore, 2003; Lonigan, 2004; Marjanovič-Umek, Sočan, & Bajc, 2007). In our study we aimed to explore the processes within the home literacy environment that mediate the relationship between the family social, economical and cultural factors on one hand, and child's language competence across toddlerhood and early childhood on the other hand.

SES-related differences in child's language competence and the quality of home literacy environment

Family SES, particularly parental education and family income, shapes children's language learning environments and thus affects their development of language (Butler, McMahon, & Ungerer, 2003; Hoff, 2003; Rowe, 2008; Sénéchal, LeFevre, Thomas, & Daley, 1998). Several studies have found significant relations between family SES and children's language competence across different ages (e.g., Crain, 2004; Powell, 2004; Walker, Greenwood, Hart, & Carta, 1994). Across different cultures, children from high-SES families have been found to display a more rapid vocabulary growth, to produce a larger number of utterances, to use a more complex grammar and a larger vocabulary when talking to their parents, and to express a more advanced storytelling ability than children from low-SES families (e.g., Bornstein & Haynes, 1998; Fekonja-Peklaj, Marjanovič-Umek, & Kranjc, 2010; Hart & Risley, 1992; Hoff, 2003; Rowe, Raudenbush, & Goldin-Meadow, 2012; Silvén, Ahtola, & Niemi, 2003). In their recent longitudinal study, Fernald, Marchman, and Weisleder (2013) found that in the period between 18 and 24 months the pattern of developmental change in toddlers' vocabulary differed as a function of family SES. The authors established that significant differences between higher- and lower-SES toddlers in both, vocabulary learning and language processing efficiency, that were already present by 18 months, emerged with a 6-month gap at 24 months.

Moreover, SES is not only related to child's language outcomes but also to the characteristics of the parental speech, directed to a child in the home setting. The evidence from several studies shows that parents with higher SES use more words, a more diverse vocabulary and grammatically more complex utterances in conversation with their children than low-SES parents (e.g., Bernstein, 1973; Hoff, 2003; Rowe et al., 2012). Less educated mothers were also found to use the imperative utterances more often than interrogative utterances, compared to mothers with higher levels of education, who in turn, more frequently responded to their children's speech, used a larger vocabulary and encouraged their children to talk about various topics (Butler et al., 2003).

In fact, the relation between SES and child vocabulary was found to be mediated by the characteristics of parental child-directed speech: the high-SES mothers use a larger vocabulary and are more encouraging of and more responsive to child's speech than are the mid-SES mothers, who in turn more frequently direct child's behaviour and less frequently elicit or continue child's talk (Hoff, 2003).

A number of studies have indicated yet another aspect of family environment, related to child's language competence as well as literacy skills, namely the home literacy environment, which refers to the availability of learning materials at home, such as books; parental encouragement of learning through activities, such as joint book reading, and access to stimulating resources outside of the home, such as libraries and theatre (e.g., Dearing & Taylor, 2007; De Jong & Leseman, 2001; Neuman, 1996; Sénéchal & LeFevre, 2002). According to the findings of several authors, well-educated parents are better at providing a literacy-enriched home environment and thus positively affect their children's language and literacy skills development (e.g., Dickinson & Tabors, 2001; Lonigan, 2004; Marjanovič-Umek, Podlesek, & Fekonja, 2005). High-SES parents have been found to encourage their children's use of language to a greater extent through different literacy activities, namely they more often buy books for their children, read to them, visit the library and puppet shows with them, they more frequently talk to their children during play and shared book reading, and their teaching approaches include more scaffolding and more complex verbal strategies (Borduin & Henggeler, 1981; Bradley & Corwyn, 2002; Marjanovič-Umek et al., 2005). Bennet, Weigel, and Martin (2002) argue that parents who are themselves articulate provide a family environment that fosters the same in their children, suggesting that parents may serve as models of verbal behaviour to their children. According to Bradley and Corwyn (2002) it is the access to educational material and cultural resources as well as the differences in parenting practices that mediate the relations between SES and children's intellectual and academic achievement. In their longitudinal study, Deckner, Adamson, & Bakeman (2006) determined that home literacy practices, children's interest in reading and the rate of mothers' metalingual utterances all predicted children's expressive language development between the ages of 18 and 42 months. According to Payne, Whitehurst, and Angell (1994), 12% to 18.5% of the variance in child language competence at the age of four can be accounted for by home literacy environment (e.g., shared picture book

reading, age of onset of picture book reading, number of picture books in the home, frequency of child's private play with books, frequency of shared trips to the library, frequency of caregiver's private reading).

Decontextualizing language: Shared reading and symbolic play as two aspects of home literacy environment

Many conceptualizations of home literacy environment have focused primarily on the occurrence or frequency of shared book reading between a parent and a child (Bennet et al., 2002). As an intensely social activity, book reading provides an interactive context for children to acquire and practice developing language and cognitive competence (Neuman, 1996). Evidence strongly suggests that shared book reading at home is important for young children's development of language, emergent literacy and reading comprehension (e.g., Bus, Van IJendoorn, & Pellegrini, 1995; DeBaryshe, 1995; Hindman, Connor, Jewkes, & Morrison, 2008; Stadler & McEvoy, 2003). Lyytinen, Laakso, & Poikkeus (1998) found that shared book reading is related to toddler's vocabulary comprehension and the use of symbolic gestures at 14 months and to child's vocabulary production, the length of his sentences and cognitive ability measured at 24 months. Shared reading in early childhood was also found to encourage children to acquire the grammatical structure of language and to develop a larger vocabulary (Robbins & Ehri, 1994; Sénéchal & LeFevre, 2002). For instance, Sénéchal, LeFevre, Hudson, & Lawson (1996) reported that storybook exposure accounted for a significant share of variance in preschool children's expressive and receptive vocabulary after controlling for parents' education, parents' own level of literacy, and children's intelligence. On the basis of their meta-analysis, Bus et al. (1995) concluded that the home literacy environment, operationally defined as the frequency of joint book reading, had a positive effect on child literacy and language outcomes (e.g., vocabulary growth, emergent literacy and reading achievement); the authors established that about 8% of the variance in children's language outcomes could be explained by joint book reading. In addition, the authors noted that this effect seemed to become smaller as soon as children were able to read on their own.

Another important aspect of family literacy environment refers to parental stimulation of child's symbolic play. Language and symbolic play are based on the similar symbolic-conceptual processes or child's representational competence as both, words and symbolic transformations of objects, persons or activities, are used in a symbolic function (McCathren, Warren, & Yoder, 1996). Evidence shows that symbolic play is linked to both, child's cognitive (e.g, Tamis-LeMonda & Bornstein, 1993) and language development (e.g., Laakso, Poikkeus, Eklund, & Lyytinen, 1999; Lewis, Boucher, Lupton, & Watson, 2000)). Infants and toddlers, who already used individual representational transformations in their play, have been found to reach developmental milestones in language development faster than their peers who did not yet include representational transformations in their play (McCune, 1995), while toddlers that had not started speaking also did not engage in symbolic play (Kelly and Dale, 1989). In a sample of older children, aged from one to six years, Lewis et al. (2000) found that the developmental level of children's symbolic play was related to their language competence. In this respect, research evidence especially emphasizes the significance of adult encouragement of child's symbolic play skills (Doyla, 2010; Hakkarainen & Bredikyte, 2008; Holzman, 2009; Laakso et al., 1999). The findings of several studies (e.g., Bornstein, Haynes, Watson O'Reilly, & Painter, 1996; Haight & Miller, 1993; Lang, 2009) suggest that during play with more competent partners, such as parents, children are exposed to encouragement, materials, and opportunities that enable them to play at a higher level than they would if playing alone. Children often take initiative for their play but on the other hand imitate adult's play behaviour and learn from the play they see as well (Bornstein et al., l996; Nielsen & Christie, 2008). Marjanovič-Umek, Fekonja-Peklaj and Podlesek (2013) especially emphasize that the role of adults in child's play is important at the stages of planning and organizing play as well as at the stages of directing and leading it towards developmentally higher and more challenging levels. The authors found that one of the strongest predictors of child's play behaviour is the frequency of mental transformations used by parents during the dyadic play with a child. In a sample of children, aged from three to six years, the authors established that parental play behaviour predicted child play content, child play frame, child mental transformations, and child play maintenance (Marjanovič-Umek et al., 2013).

As the majority of studies which investigated the effect of family literacy environment on child's language development focused on one particular aspect of literacy activities, we aimed to design a family study that would include a broader range of different factors of family environment to obtain a more detailed and a wholesome insight into the processes that might influence child's language within the family setting. Although the significant relations between family SES measures and child's language outcomes are well established, less is known about the family factors that mediate these relations. In this respect, Gottfried et al. (2003) emphasize that, when studying the effect of SES on child's development, it is necessary to explore how SES enters children's proximal experiences in the family. In our study, we aimed to explore the ways in which SES-related factors of family environment (parental education, family possessions and parent-to-child speech) affect child's language across toddlerhood and early childhood. In particular, we propose a mediational path model in which we presume that parental activities, which support and encourage child's language (shared reading, literacy activities and parental symbolic play) act as mediating variables, mediating the effect of parental education, family possessions (as two
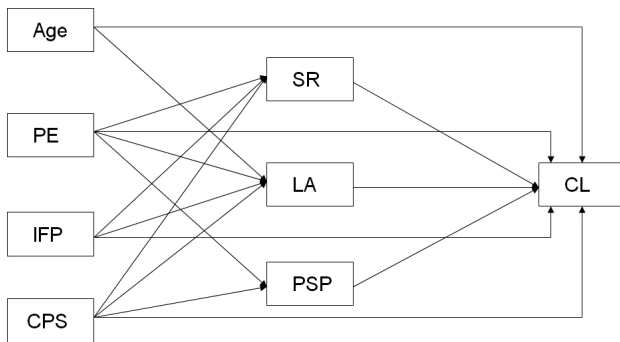
Figure 1. Conceptual diagram for the fitted path model. Age = Child's age in months, PE = parental education, PCS= Parent-to-child speech, IFP = Index of family possessions, LA = Literacy activities, MT = Parent's mental transformations during adult-child shared play, SR = Shared reading, CL = Child's language.

measures of family SES) and parent-to-child speech (as a global measure of language input that the child is exposed to at home during different everyday interactions with his parents) on child's language (see Figure 1). In fact, we hypothesized that parental educational level, family possessions and the characteristics of parents' speech affect the frequency and the quality of family literacy activities; it is through these activities that the family social, economic and cultural status might in our opinion affect child's early language development within the home setting. Child's age was supposed to have a direct effect on child's language as toddlerhood and early childhood are the periods of rapid developmental changes in language development. In addition, an indirect effect of child's age was proposed through the literacy activities as child's engagement in many of these activities (e.g., how often parents take their children to children's workshops, puppet shows, and the library) might be effected by child's age.

Method

Participants

The sample included 99 families with 1- to 6-year-old children (52 girls and 47 boys): 29.5% 1-year-olds, 21.6% 2-year-olds, 14.8% 3-year-olds, 18.2% 4-year-olds, and 15.9% 5-year-olds (M = 37;8 months; SD = 18;3 months). Families were sampled through preschools and by using the snowball method, taking into account the children's age, so that only families with children, aged from 1 to 6 years, were invited to participate in the study. Only families in which both parents speak Slovenian with the child were selected. The parents differed according to the level of completed formal education (families were selected in a way that the educational level of both parents fell into the same educational category): 9.3% had less than a secondary-school degree, 16.3% had a secondary-

school degree, 9.3% had a junior college degree, 43% had a bachelor's degree, and 22.1% had a master's degree or a doctorate (M = 14.0 years of completed formal education; SD = 1.97).

Measures and materials

The questionnaire *Parent Interview* (Marjanovič-Umek & Tašner, 2010) was used to collect data on family environment factors: social, cultural and economic indicators, and activities related to encouraging language and early literacy. The questionnaire consists of two parts. The first part includes questions about the family's social, cultural and economic status (SCES), namely the first question refers to the highest educational level achieved by parents (ranging from unfinished primary school to doctorate), while the following 17 questions refer to the family material and educational resources, which are summarized by four broader indicators of family possessions: (1) Family material possessions (e.g., possessing a child's room, a computer, or Internet access); (2) Family cultural possession (e.g., owning classic literature, works of art); (3) Family educational resources (e.g., the use of educational computer programs, scholarly literature and journals or handbooks), and (4) Number of books in the home (the number of adult and children's books). The second part of the questionnaire contains 13 questions concerning the frequency of the activities that are expected to stimulate children's language and early literacy development (e.g., how often parents take their children to children's workshops, puppet shows, and the library; how often children see their parents read; how often parents read and tell stories to their children). The questions included in the questionnaire form the basis for a semi-structured interview with parents, in which the researcher asks questions, writes down parents' answers and later assesses the frequency of performing a certain activity based on the parents' answers (the rating scale ranged from 0 (never) to 5 (very frequently)).

Child's exposure to children's literature was evaluated using the *Checklist of Titles and Authors of Children's Books* (*CTACB*; Marjanovič-Umek & Fekonja-Peklaj, 2011). The *CTACB* has been designed on the basis of the checklist by Sénéchal et al. (1996), who used this method (assessment of parents' knowledge of children's book titles and authors) to assess children's exposure to children's literature, representing an indirect measure of shared reading within a family. The *CTACB* has two parts. Part one contains a list of 39 titles, of which 25 are actual titles of storybooks and 14 are made-up titles. Part two contains a list of 40 first and last names, of which 25 are the names of authors of storybooks and 15 are made-up names. The titles include traditional books (fairy tales and storybooks) as well as modern children's literature. The list includes instructions for parents to carefully read all of the titles and names and to mark the ones that they think are real. The score on the list is the number of correct answers minus the number of incorrect ones, and the highest possible score is 50.

The language of toddlers 1 to 2.6 years old was assessed using the Slovenian adaptation of the *MacArthur-Bates Communicative Development Inventory (CDI)*—that is, the *CDI: Words and Gestures* (Marjanovič-Umek, Fekonja-Peklaj, Sočan, & Komidar, 2011) was used to assess the vocabulary of 12- to 16-month-old toddlers, and the *CDI: Words and Sentences* (Marjanovič-Umek et al., 2011) was used to assess the vocabulary of 16- to 30-month-old toddlers. The parents marked on the checklist which words from the total selection of words included in the *CDI: Words and Gestures* (394 words) and the *CDI: Words and Sentences* (680 words) are used by their toddler. The scores of toddlers included in our sample on the *CDI: Words and Gestures* ranged between 0 and 19 words (*M* = 8.00; *SD* = 6.40), and on the *CDI: Words and Sentences* from 0 to 640 words (*M* = 195.65; *SD* = 175.00).

The language competence of toddlers and children, aged from 2.6 to 6 years was evaluated using the *Scales of General Language Development – LJ (SGLD – LJ)* (Marjanovič-Umek, Fekonja-Peklaj, Podlesek, Kranjc, & Bajc, 2008) which include three scales: *Language Comprehension Scale*, *Language Expression Scale*, and *Metalinguistic Awareness Scale*. Children are tested individually by a test administrator using different testing materials (e.g. toys, pictures). Correct answers are awarded from 1 to 5 points on various tasks, thus three partial scores are achieved while the sum of all three partial scores (up to 205 points possible) represents a general assessment of child's language. The scores achieved by the children included in our sample ranged between 67 and 205 points (*M* = 140.67; *SD* = 42.76). The split-half alpha reliability coefficient calculated for individual scales and different age groups (from 2 to 6 years old) ranges between .97 and .68 for the *Language Comprehension Scale*, from .92 to .88 for the *Language Expression Scale*, and from .89 to .95 for the *Metalinguistic Awareness Scale*.

The *Scale for Assessing Parent-to-Child speech* (Marjanovič-Umek, Fekonja-Peklaj, Tašner et al., 2011) was used to evaluate the characteristics of speech that parents used in verbal communication with their children during everyday activities. The scale consists of 12 statements, which refer to different aspects of parent's conversation with a child (e.g., »Uses unfinished sentences.«; »Speaks of objects and events which are not present in child's immediate environment.«; »Responds to child's statements by maintaining the topic of the conversation.«). For each statement, the observer used a six-point assessment scale to assess the frequency of certain characteristics of the recorded parent-to-child speech used in communication with a child (0 = the speech described was never used, 5 = the speech was very frequently used). The measure of overall parent-to-child speech (referring to the grammatical complexity and content of speech) is computed as an average score of all ratings. The split-half reliability coefficient was .83.

Parental encouragement of child's symbolic play was assessed using the *Scale for Observing Child-Adult Play* (Marjanovič-Umek & Fekonja-Peklaj, 2012), which contains 24 statements referring to parental play behaviour during shared play with a child. The statements are classified into five categories, namely Play Content, Play Frame, Direct Guidance, Mental Transformations, and Play Maintenance. For each statement, the observer uses a six-point assessment scale (0 = the behaviour described was never displayed, 5 = the behaviour was very frequently displayed) to assess the frequency of parent's play behaviour during shared-play. For the purpose of this study only the parent's Mental Transformations score (computed as the average rating on the following 9 items: *Uses metalanguage; Plays as if the toy is a real person, object, or animal, and illustrates this verbally; Transforms the toy by naming the transformation; Ascribes a specific feature to the object or its substitute; Speaks in the role he or she takes on; Adopts the role's speech register; Asks the child to take on the role; Creates an imaginary situation; Plays without a toy - only uses language or gestures*) was included as the measure of parental encouragement of child's symbolic play, as parent's use of mental transformations had been found to be the strongest predictor of child's use of mental transformations during shared-play in one of the previous studies (Marjanovič-Umek et al., 2013). The split-half reliability coefficient for the *Mental Transformation* category was .84.

All of the parents and their children played with the same toys, which were selected for the purpose of this study, while taking the children's age into account. Three sets of toys were designed: one for toddlers 1 to 2;6 years old, one for children 2;6 to 4 years old, and one for children 4 to 6 years old. All three sets contained structured toys (e.g., animal and farmer figurines, a tractor, a cup, a plate and a spoon, a doll) and unstructured material (e.g., wooden blocks, sticks, stones and coloured paper), but the sets intended for the older groups contained more unstructured material.

Procedure

Families were sampled through preschools and by using the snowball method, so that families who have responded to our request for the participation in the study also provided us with a contact of another family with a child of a desired age. A letter was sent to the parents inviting them to participate in the study. It included a description of the purpose of the study, an explanation of the entire course of the study, and the notification that they could cancel their participation in the study at any time. Only families from which we received informed written consent from the parents were included in the study. The test administrators, psychology students, contacted every family included in the sample. Before data collection began, test administrators received training in using materials, assessing and evaluating the data collected. All of the data were collected at families' homes during two visits. Parents decided which one of them would participate in the study (92% mothers and 8% fathers participated) and the test administrator then arranged to visit the home

when that parent was available. During the first visit, the test administrator first used the *Parent Interview,* a semi-structured interview with the parent to gather information on the family environment information. While the parent completed the *Checklist of Titles and Authors of Children's Books*, the test administrator assessed the child's language with the *SGLD–LJ* if the child was older than 2;6 years. She asked the parents of 12- to 30-month-old toddlers to complete the *CDI: Words and Gestures* or the *CDI: Words and Sentences* at home and to return them in 14 days, when the test administrator revisited the family. During the second visit the test administrator videotaped 90 minutes of everyday activities in which parents got involved with their children (30 minutes of each of the following activities: a routine activity; play with standard toys, brought by the administrator and a joint activity chosen by parent (e.g., drawing, shared reading)). Every 90-minute videotape of the parent-child verbal interactions was assessed by two trained evaluators using the *Scale for Assessing Parent-to-Child Speech*, while the 30-minute videotape of parent-child play with standard toys was assessed by two trained evaluators with regard to parental encouraging of child's symbolic play, using the *Scale for Observing Child-Adult Play* (the Mental Transformations category). The observers assessed the tapes separately and, if their evaluation of a specific item differed by more than one point on a six-point assessment scale, they watched the tape again and agreed on the final score. The score was computed as the across-observes average of assessed frequencies of play acts.

Statistical analysis

The parents' answers, obtained in the first part of the semi-structured interview using the *Parent Interview* questionnaire, were summarized by two variables: parental education (*PE*), which represents the level of formal education completed by parents, and index of family possessions (*IFP*), which was calculated as the sum of the standardized partial indices of the family's material possessions, family cultural possessions, family educational resources, and the number of books in the home. Each of these four indices was calculated as the first principal component of the group of items in the *Parent Interview* questionnaire, related to each particular aspect of family possessions. The reliability of each partial index was evaluated as the coefficient alpha for the first principal component (cf. Ten Berge & Hofstee, 1999). The reliability estimate for *IFP* was then estimated by the standard formula for the reliability of a linear composite (cf. Nunnally & Bernstein, 1994); its value was .82. The parents' answers obtained in the second part of the semi-structured interview were combined into variable Literacy activities (*LA*). Because the score on the Literacy activities scale was calculated using principal component scoring weights, the reliability of this score was also estimated with the coefficient alpha for the first principal component, which was .78.

Since the child's language was assessed with one of two measures (either *SGLD–LJ* or *CDI*) depending on the child's age, it was necessary to merge both sets of measurements to enable the analysis of all data in a single model (thus we obtained a variable, named Child's language (*CL*)). Due to high correlations of both language measures with age (.83 in both cases), we used child's age as an anchor variable: we linearly transformed the test scores so that the regression parameters of language competence on age were identical in both age groups (a 1-month difference in the toddlers'/children's age corresponded to the equal difference in transformed scores, and the age limit of 2;6 years corresponded to the same transformed value on both scales).

The composite ratings of the parent-to-child speech and the frequency of parental mental transformations during shared play with a child were calculated as the average score of both evaluators on the *Scale for Assessing Parent-to-Child Speech* and the *Scale for Observing Child-Adult Play*. Thus two variables were obtained, namely the Parent-to-child speech (*PCS*) and the Frequency of parental mental transformations during play (*MT*).

The 5% alpha level was used for significance testing throughout the study. Because of notable departures from normality in some variables, robust testing approaches were used.

The path analysis was performed using the Mplus 6 program (Muthén & Muthén, 1998-2010). For the purpose of model fit evaluation, where child's age, parental education, family possessions and parent-to-child speech were modelled as exogenous variables with both direct and indirect effects on child's language, while shared reading, literacy activities and parent's symbolic play were modelled as mediating variables, we used criteria suggested by Hu and Bentler (1998, 1999): we considered the fit to be good if RMSEA < .05, SRMR < .08 and CFI > 0.95.

Results

Table 1 presents the descriptive statistics for all variables except parents' education. The distribution of this variable has already been described in the Method section. *IFP* and *LA* had zero means because they were derived from other variables rather than measured directly. The coefficients of skewness and kurtosis reveal a notable departure from normality in some variables. As should be expected, the distribution of age is close to symmetric with a negative kurtosis. A fairly large negative kurtosis was also found with *PCS* and *CL*, indicating a small number of very high or low values, respectively, possibly pointing to lower discrimination of the respective measurement instruments at the extremes of the distributions. On the other hand, the distribution of *IFP* is characterised by a very high negative skewness and positive kurtosis, partly due to several cases with very low values of this indicator.

Table 1. *Descriptive statistics for variables in the model*

	M	*SD*	*Min*	*Max*	Skewness	Kurtosis
Age	38.40	18.43	12	77	0.34	−1.13
PCS	18.09	5.80	6	29	−0.02	−0.96
IFP	0.00	0.72	−3.44	0.99	−2.00	6.20
LA	0.00	1.00	−2.17	2.06	−0.16	−0.83
MT	23.36	13.49	0	59	0.50	−0.61
SR	19.65	7.68	5	37	0.20	−0.53
CL	−0.73	1.13	−2.55	1.76	0.38	−1.02

Notes. Age = Child's age in months, PCS= Parent-to-child speech, IFP = Index of family possessions, LA = Literacy activities, MT = Parent's mental transformations during adult-child shared play, SR = Shared reading, CL = Child's language.

Firstly, we calculated Pearson's correlation coefficients between child's age and the rest of the modelled variables. Child's age statistically significantly and positively correlated with *PCS* ($r = .37$), *LA* ($r = .49$), *MT* ($r = .23$) and *CL* ($r = .94$), while the correlations between child's age and the remaining variables (*IFP*, *PE* and *SR*) were positive but statistically insignificant. In the next step we calculated partial correlations between the modelled variables with child's age controlled (the partial correlations are presented in Table 2). All correlations were positive and of moderate size; fifteen (out of 21) correlations were statistically significant. With linear effect of age partialled out, *PCS*, *LA* and *MT* had a significant and positive correlation with child's language.

Figure 2 presents the path model that was fitted to the data. Child's age, parental education, family possessions and parent-to-child speech were modelled as exogenous variables with both direct and indirect effects on child's language. Shared reading, literacy activities and parent's symbolic play were hypothesized to act as mediating variables, representing the family literacy practices.

The model was fitted by Mplus 6 software (Muthén & Muthén, 1998-2010) using the robust maximum likelihood (MLM) estimator. The model fit was very good: $\chi^2(6) = 3.74$, $p = .71$; RMSEA = 0.000, CFI = 1.00, SRMR = 0.022. The R^2 values for the predicted variables were 91% for *CL*,

37% for *SR*, 38% for *LA* and 25% for *MT*. With regard to the very large proportion of explained variance in child's language we should however note that 88% of the variance of *CL* can be explained by child's age alone.

Table 3 presents the standardized path coefficients; because of a relatively small sample size, confidence intervals are presented as well. Only child's age and parent's mental transformations during symbolic play with a child had a significant direct effect on child's language. Furthermore, *SR* had significant path coefficients from *PE*, *IFP* and *PCS*, *LA* from *PE* and Age, and *MT* had a significant coefficient from *PCS*.

Table 4 presents standardized total and indirect effects on child's language. The total effect of age was large and significant due to a large direct effect; the indirect effect of age (via literacy activities) was however negligible. Parental education had a significant total effect; neither direct nor

Table 2. *Partial correlation coefficients between modelled variables with child's age controlled*

	PCS	IFP	PE	LA	MT	SR
IFP	.31*					
PE	.37*	.53*				
LA	.33*	.35*	.35*			
MT	.45*	.13	.29*	.17		
SR	.38*	.47*	.54*	.31*	.19	
CL	.47*	.13	.15	.52*	.34*	.16

Notes. IFP = Index of family possessions, PE = parental education, LA = Literacy activities, MT = Parent's mental transformations during adult-child shared play, SR = Shared reading, PCS= Parent-to-child speech, CL = Child's language.
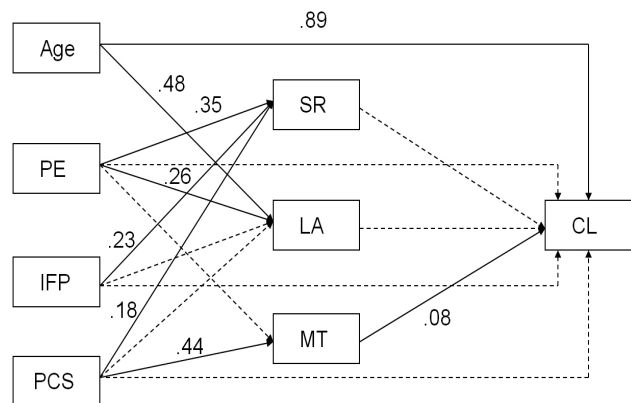* $p < .05$. Statistical significance was tested by means of bootstrap.

Figure 2. Conceptual diagram for the fitted path model with estimated parameters. The values shown are statistically significant ($p < 0.05$) standardized path coefficients. Solid lines indicate paths with statistically significant coefficients; dashed lines indicate paths where coefficients were estimated but were not statistically significant. Age = Child's age in months, PE = parental education, PCS= Parent-to-child speech, IFP = Index of family possessions, LA = Literacy activities, MT = Parent's mental transformations during adult-child shared play, SR = Shared reading, CL = Child's language.

Table 3. *Standardized path coefficients*

Outcome variable	Predictor variable	β	*p*	LB	UB
CL	SR	0.007	0.858	−0.069	0.083
	LA	0.014	0.677	−0.052	0.080
	MT	0.075	0.020	0.012	0.139
	Age	0.891	0.000	0.824	0.958
	PE	0.064	0.111	−0.015	0.143
	IFP	0.036	0.225	−0.022	0.093
	PCS	0.062	0.113	−0.015	0.139
SR	PE	0.347	0.000	0.154	0.539
	IFP	0.234	0.004	0.075	0.393
	PCS	0.182	0.036	0.012	0.351
LA	PE	0.255	0.011	0.058	0.452
	IFP	0.165	0.095	−0.029	0.359
	PCS	0.004	0.966	−0.193	0.202
	Age	0.480	0.000	0.311	0.649
MT	PCS	0.444	0.000	0.269	0.620
	PE	0.119	0.134	−0.036	0.274

Notes. Age = Child's age in months, PE = parental education, PCS= Parent-to-child speech, IFP = Index of family possessions, LA = Literacy activities, MT = Parent's mental transformations during adult-child shared play, SR = Shared reading, CL = Child's language. β = standardized path coefficient, *p* = two-tailed *p* value, LB & UB: lower and upper bound, respectively, of the 95% confidence interval for the standardized path coefficient.

indirect (via *SR*, *LA* and *MT*) effect of parental education was significant. While the direct effect of parent-to-child speech was not significant, this predictor had a relatively small, although still significant, indirect effect on child's language. This indirect effect can be mostly attributed to the path via parent's mental transformations during symbolic play: the size of this specific indirect effect was .033 (*p* = .046), while the specific indirect effects via *SR* and *LA*, respectively, were not larger than .001. Finally, no effect of any kind of index of family possessions was significant.

Discussion

In our study, we aimed to establish the relations between social, economic and cultural aspects of family environment and child's language outcomes as well as to examine a possible mediating effect of family literacy

Table 4. *Standardized total and indirect effects on child's language*

	Total effect		Total indirect effect	
	Effect	*p*	Effect	*p*
Age	0.898	0.000	0.007	0.682
PE	0.079	0.027	0.015	0.342
IFP	0.040	0.156	0.004	0.700
PCS	0.097	0.018	0.035	0.034

Notes. Age = Child's age in months, PE = parental education, IFP = Index of family possessions, PCS= Parent-to-child speech.

practices and parental encouragement of symbolic play on child's language. The findings of several previous studies (e.g., Gottfried et al., 2003; Lonigan, 2004; Raviv et al., 2004) indicated that the characteristics of family environment represented important predictors of child's language development. Our findings suggest that child's age itself is, compared to the environmental factors of the family, most strongly related to child's language in the period between the first and the sixth year of age. We should take into consideration that, because the child's age acted as an anchor variable in the process of merging the language variables into a single language score, the linear effect of age can be expected to be slightly overestimated. Nevertheless, with children's growing age, their language ability increased significantly, suggesting that, as emphasized by several authors (e.g., Brooks & Meltzoff, 2008; Fenson et al., 1994), toddlerhood and early childhood are the periods of rapid language development. With children's increasing age, parents also more frequently engaged their children in literacy activities and used more mental transformations during shared play with children.

Thus, with the linear effect of child's age partialled out, the obtained correlations between different variables, both distal and proximal, showed that both SCES-related measures (parental education and index of family possessions) were significantly and positively related to each other as well as to all of the other family measures. Namely, more educated parents provided their families with more material and cultural possessions, educational resources, as well as with a higher number of books than less educated parents. Furthermore, more educated parents and parents from families with a more favourable index of family possessions used a more supportive parent-to-child speech when talking to their children, e.g., they

more frequently used grammatically complex sentences, metalanguage and metaphors; they sustained and continued the topic of the conversation and talked about things that were not present in the immediate environment. Those parents also tended to include their children more frequently in different literacy activities (e.g., they more frequently read to the child, visited library, puppet shows and galleries, told stories to their children, and encouraged early literacy skills by teaching their child to read) than less educated parents and parents from families with less favourable index of family possessions. More educated parent also used more mental transformations when playing with their children than less educated parents did. These findings indicate that family SCES, in particular parental education and family possessions, significantly shapes children's language learning environment, thus supporting the findings of several authors about the important relations between family SES and the quality of home literacy environment (e.g., Dearing & Taylor, 2007; De Jong & Leseman, 2001; Neuman, 1996; Sénéchal & LeFevre, 2002). Moreover, while controlling for child's age, the parent-to-child speech, the frequency of parental mental transformations during shared play with a child and the frequency of family literacy activities proved to be significantly related to children's language outcomes. Children, whose parents used a more complex speech when communicating with them, used more mental transformations when playing with them and more frequently involved them in literacy activities, expressed higher language competence between the ages of one and six. These findings are in line with the findings of several other authors who emphasize the importance of different aspects of home literacy environment for children's language outcomes (e.g., Dearing & Taylor, 2007; De Jong & Leseman, 2001; Neuman, 1996; Sénéchal & LeFevre, 2002).

To better understand the nature of the observed relations between different environmental factors and children's language outcomes, we further examined in what ways parental education, index of family possessions and parent-to-child speech might influence child's language competence. Based on the research evidence, which on one hand proved that family SES was related to child's language across different ages (e.g., Crain, 2004; Powell, 2004; Sénéchal et al, 1998; Walker et al., 1994) and on the other hand suggested that well-educated parents better provided a literacy-enriched home environment (e.g., Bradley & Corwyn, 2002; Dickinson & Tabors, 2001; Lonigan, 2004), we hypothesized that SCES-related measures, such as parental education, index of family possessions and parent-to-child speech, influenced children's language competence indirectly through the mediating role of home literacy practices, such as literacy activities, shared reading and symbolic play. The results of the path analysis showed that the hypothesized model fitted our data well; we managed to explain 37% of variance in the frequency of shared reading between parents and children, 38% of variance

in the frequency of literacy activities, 25% of variance in the frequency of parental use of mental transformations during shared-play and 91% of variance in children's language outcomes, however we should emphasize that a very large proportion of explained variance (88%) in child's language could be explained by child's age alone. In particular, the frequency of shared reading in the family was significantly predicted by parental education, index of family possessions and parent-to-child speech, while the frequency of different literacy activities was predicted by parental education and children's age, meaning that the frequency of family literacy activities increased with the level of parental education but also with the child's increasing age. The obtained results support the findings of several other authors who found that high-SES parents encouraged their children's use of language through different literacy activities to a greater extent than low-SES parents, e.g., by buying books for their children, involving them in shared reading, visiting the library and puppet shows, using scaffolding teaching strategies (e.g., Borduin & Henggeler, 1981; Bradley & Corwyn, 2002; Marjanovič-Umek et al., 2005).

Based on the findings of our study, parental education proved to be a stronger predictor of family literacy activities than family material and cultural possessions. Furthermore, the frequency of parental use of mental transformations during the shared-play with a child was predicted by the characteristics of parent-to-child speech suggesting that parents, who used a more complex and supportive speech, directed to a child, more frequently demonstrated the use of mental transformations during the play with a child. However, it should be noted that shared play was used as an activity during which both parent-to-child speech and mental transformations were assessed. Although language and symbolic play are known to be closely related, as mental transformations are developed with language and on the other hand, language enables the use of mental transformations (McCathren et al., 1996), the fact that both, parental speech and the use of mental transformations were assessed during the same activity might have contributed to higher correlations between the two measures.

Considering the direct and indirect effects of different variables on children's language competence, we found that only parent's use of mental transformations during play, in addition to child's age, had a significant direct effect on child's language. Although parental education had a significant total effect on children's language outcomes, unfortunately, neither direct nor indirect via any of the mediating activities was significant, thus the path of this effect remains unclear. It should also be noted that due to a relatively low variability in parental education, the standardized effect of parental education might be underestimated in this model. One of the reasons why the two mediating variables (shared reading and literacy activities) did not have a significant effect on child's language might also derive from the fact that the parents of children in our sample were on average highly educated,

thus none of the children came from an extremely poor and unfavourable home environment where parents would not read to their children nor include them in any kind of literacy activities. In addition, although the direct effect of parent-to-child speech to child's language was not significant, we could prove its indirect effect on child's language via parent's use of mental transformations during play. The characteristics of parental child-directed speech were found to be related to child's language in several other studies (e.g., Butler et al., 2003; Hoff, 2003), while our findings suggest that this relation is mediated by parental encouragement of child's symbolic play, namely by parental use of mental transformations during shared play with a child. In this respect, the obtained results highlight the important role that symbolic play has in child's language development. As the relation between child's symbolic play and language competence is well established (e.g., Kelly & Dale, 1989; Lewis et al., 2000; McCune, 1995), it seems, based on our findings, that by demonstrating and sustaining child's symbolic play, parents significantly influence their children's language development.

On the basis of our findings we may conclude that the social, economic and cultural aspects of family environment play an important role in shaping child's language environment in the periods of toddlerhood and early childhood. One important finding of our study, and an important addition to previous research, relates to the significant role of parental encouragement of child's symbolic play in child's language development. In particular, the effect of parental speech directed to a child proved to be mediated by parental encouragement of symbolic play.

Although the sample of children was small, due to the time-consuming data collection, we believe that several positive aspects of this study might be highlighted. The study is original in the scope of its design, including the socio, cultural and economic aspects of child's family environment as well as family literacy practices, which proved to be related to child's language development within the family context. In addition, the data were collected in the family home, namely via direct observation and by interviewing parents, thus increasing the ecological validity of the collected data. Using the interviews with parents, we hope to have largely avoided socially preferred answers, which might have been more frequently given by parents if we had used the questionnaires, based on the self-assessment of the frequency of family literacy activities. On the other hand, there are some drawbacks of the study that should be highlighted and taken into consideration when discussing the findings. The first major drawback refers to the sample of parents that was somewhat biased given the relatively small share of parents with extremely low education and the high share of parents with a tertiary education, which might also to some extent reflect the self-selection bias introduced by the use of the snowball method when recruiting the sample. We should also note that the parental speech and

the use of mental transformations were estimated during the same activity - the shared play, which might have affected the correlation between the two measures. Finally, the reader should bear in mind that all relationships in our model are relationships between manifest variables, which are somewhat affected by the measurement error. Unfortunately, a latent variable model was not feasible in our case, mostly due to technical reasons (small sample size, reflective nature of some constructs etc.).

We suggest that future research should focus on examining the specific ways in which parental encouragement of child's symbolic play might diminish the differences in children's language, deriving from the differences in the quality of their family environment. In future research, additional effort should be made to sample the children deriving from extremely non-supportive home environment, where literacy activities are rare, to establish the importance of literacy activities and shared reading for child's language and to indicate possible protective factors that might lesser the negative effect of less stimulating home environment on child's language.

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