



## Family context and cognitive development in early childhood: A longitudinal study



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### ABSTRACT

This study explores the influence of the quality of the family context and sociodemographic factors on cognitive development in a population-based cohort of 295 children and their families. The quality of the family context was assessed when children were approximately 2 years old (mean age = 26.2 months) in home visits, during which data were gathered on the quality of stimulation of both cognitive and socioemotional development and the physical and social context. The children's cognitive development was individually assessed approximately 2 years later (children's mean age = 53.6 months). Structural equation modelling showed that better-quality socioemotional interactions improve parental performance in the promotion of cognitive and linguistic development, a variable that is a long-term predictor of children's cognitive development. First-born status and exposure to a bilingual environment also predict cognitive development at age 4. These findings are presented in the form of a complex model, including multiple sources of influence on the criterion variable. Results may guide the implementation of parenting programmes aimed at strengthening the promotion of cognitive development.

### 1. Introduction

Research in recent years has provided empirical support for the view that the family context has a significant impact on children's cognitive development. The conceptual framework used to bring together those factors related to the family context which have an influence on development is Bronfenbrenner (2005), which considers the family to be an interactive microsystem connected with the social world as represented by meso-, exo- and macrosystems. Considering the nature of the present research, the analysis takes into account variables within the first three of these systems. Assessment of the influence of the family context on cognitive development starts at the microsystem level, which includes all social interactions within the family. Among these, play-based interactions are of particular importance; the scientific literature provides evidence of a positive association between play and cognitive development, including the enhancement of executive functions (Ginsburg, 2007; Lockhart, 2010). As indicated by Milteer et al. (2012), play is a natural tool for coping with conflicts and developing resilience, as well as learning to cooperate and to develop perspective-taking.

In relation to parental support for cognitive development (a process called scaffolding), Hammond, Müller, Carpendale, Bibok, and

Liebermann-Finestone (2012) showed that this support promotes the development of executive functions in 3-year-old children. The concept of scaffolding includes decontextualised interaction; Galende, Sánchez de Miguel, and Arranz (2012) found that this type of interaction, together with linguistic scaffolding and immediate correction of children's behavior and linguistic production, is associated with the development of theory of mind in 5-year-old children. Furthermore, a study by Morrissey (2011) with preschool children showed that mothers of children with high IQs, as measured with the Stanford Binet Intelligence Scale-IV, had introduced analogical reasoning and metacognitive practices earlier than mothers of children with average IQs.

Another significant variable inside the microsystem is cognitive and linguistic stimulation. Parental sensitivity when responding to their children's exploratory and communicative behavior is predictive of the learning of new words during the early stages of language development (Tamis-LeMonda, Kuchirko, & Song, 2014). A study by Dieterich, Assel, Swank, Smith, and Landry (2006) showed that mothers using a more extensive and complex verbal scaffolding with their 3- to 4-year-old children during daily routines of care and shared playtime, is predictive of their children having a greater ability to decode text at age 8 and higher reading comprehension at age 10. In line with previous studies, the recent study by Shah, Sobotka, Chen, and Msall (2015), based on a

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longitudinal study of a sample of 12,642 children aged between 4 and 36 months, showed that children of families with low socioeconomic status (SES) had fewer interactions related to reading, singing, storytelling and outings with their parents. The lack of these activities was associated with an increased risk of delays in cognitive and linguistic development.

Expression and regulation of emotions are also key aspects of the family microsystem; in this context, language becomes an important tool for reflection and awareness-building that helps children to understand and classify emotions, as well as their own behavior and that of others in terms of mental states (Sharp & Fonagy, 2008). Bernier, Carlson, Deschênes, and Matte-Gagné (2012) carried out a longitudinal study with a sample of children between the ages of 1 and 3, assessing the influence of attachment type and quality of the family context (maternal sensitivity, support for autonomy, discussion of emotional states, and quality of the father-child interaction) on executive functioning. Both variables were found to be good predictors, and specifically, children who experienced higher quality caregiving and those who were more securely attached were found to perform better on inhibitory control, working memory and set-shifting at age 3.

Another relevant microsystem characteristic is optimal frustration (i.e. non-excessive frustration) which, when well-managed by parents, has an activating effect on cognitive development (Pekrun, 2011; Pešić & Baucal, 1996). In terms of parenting style during childrearing, an analysis of the relationship between parenting styles and academic performance (as an indirect indicator of cognitive development) indicates that better academic achievement at school is associated with a democratic style characterised by affection, control and demands (Hernando, Oliva, & Pertegal, 2012). Similarly, parental practices that promote autonomy influence children's cognitive development, as shown in the longitudinal study by Matte-Gagné and Bernier (2011), in which children who received more encouragement to be independent at 15 months had better verbal skills at age 2, with this explaining their better performance in executive tasks 1 year later.

The involvement of the father or a second parental figure in child-rearing is another widely studied variable. A meta-analysis by Sarkadi, Kristiansson, Oberklaid, and Bremberg (2008) suggests that the involvement of the father or another parental figure during early childhood is associated, among other variables, with better cognitive development. Moreover, paternal involvement mitigates the adverse effect of socioeconomic disadvantages on cognitive development in low-income families. The positive quantitative and qualitative effect of paternal involvement has been shown in a study by Huerta et al. (2013) which, using data from Australia, Denmark, the United Kingdom and the USA, observed that paternity leave and fathers' involvement in high quality stimulation benefited their children's cognitive development.

Children's exposure to family conflict also forms part of the microsystem interactions. In general, research has shown that a high level of exposure to marital conflict is a risk factor for delayed socioemotional and cognitive development during childhood (Hinnant, El-Sheikh, Keiley, & Buckhalt, 2013). A chaotic, conflict-ridden home environment is a source of stress for children that can negatively affect their intellectual development. Furthermore, for healthy psychological development, the level of parental stress needs to be low, thus indicating that parents enjoy the childrearing experience rather than viewing it as a source of worry. Stressed parents spend less time on activities aimed at contributing to their children's learning, are less sensitive and loving and are more likely to have an authoritarian parenting style (Conger, Conger, & Martin, 2010; Neece, Green, & Baker, 2012). This has been demonstrated in a study by Sparks, Hunter, Backman, Morgan, and Ross (2012), based on 150 mother-child pairs, in which the authors found that children of highly-stressed mothers had lower levels of motivation during interactive play time at 6 and 18 months of age.

Regarding social interactions within the mesosystem, defined as relationships between interactive microsystems in Bronfenbrenner (2005), the quality of the care provided by caregivers other than

parents should be taken into account, since it includes interactions beyond the parent-child subsystem. The work carried out by Vandell et al. (2010) highlights the positive effects of stable, sensitive, high-quality non-parental care on both cognitive development during the first 4 years of life and academic achievement at age 15. The positive effects of high-quality non-parental care on linguistic development are also clearly demonstrated in the work of Luijk et al. (2015).

Another variable within the mesosystem is the relationship with the extended family and social network of friends and services. The influence of support from the extended family is clearly shown in a study by Jæger (2012) that highlights the positive effect of interactions with the extended family on children's educational success; indeed, positive relationships with the extended family compensate for the negative effects of a disadvantaged economic status. On the other hand, children from families that receive insufficient support are more exposed to negative effects through a reduction in social and educational opportunities (Bidmead & Whittaker, 2007).

Also in the framework of the mesosystem, we should consider relations with the school, assessed in terms of the frequency of contact and level of involvement of the main caregivers with their children's school. The fact that children spend many hours at school is a sufficient argument in favour of collaboration between home and school contexts for learning and development, these being the most important settings in early childhood (Galindo & Sheldon, 2012). Crosnoe (2015) describes evidence of the benefits of such a family-school educational partnership on child development.

Another important mesosystem variable is parental promotion of children's social interactions; Pettit, Bates, and Dodge (1997) suggested that this should be assessed using the Development History tool. Children's development can be enhanced by their participation in diverse contexts in which they have opportunities to be actively involved and in which they carry out activities and develop relationships with other people. Various different studies have shown the positive effect of peer play interactions on the achievement of social competence and academic skills during early childhood (e.g., Bulotsky-Shearer et al., 2012).

The diversity of new experiences provided by parents, an element considered in the original Home Observation for Measurement of the Environment (HOME) inventory (Caldwell & Bradley, 1984), is a variable that lies between the meso- and exosystems. This variable reflects children's exposure to situations that broaden their horizons, which are directly associated with cognitive development. In other words, activities such as visiting museums, using libraries, going to the theatre and playing sports, as well as the use of computer games, among others, contribute to improving executive functions and cognitive development in general (Diamond & Lee, 2011).

Within the exosystem, defined as the different settings in which development occurs, Caldwell and Bradley (1984) suggested including material for stimulating learning at home as one of the criteria for assessing the quality of the context. Research on this topic has shown that jigsaw puzzles at 2 to 4 years of age (Levine, Ratliff, Huttenlocher, & Cannon, 2012) and block play at 3 years of age (Verdine et al., 2014) enhance spatial thinking, an essential element of mathematical reasoning. In a study with 7-year-old children, Nath and Szűcs (2014) found that construction play with LEGO helped develop visuospatial memory, and that this was a determinant of better mathematical performance. Furthermore, the availability of materials that encourage reading, such as storybooks and other reading material, and interaction with parents, may facilitate linguistic learning and have a direct influence on early childhood development (Tomopoulos et al., 2006).

Also within the exosystem, development may be influenced by the quality of the physical context, which refers to the home and its characteristics, since this is one of the settings in which the children spend their time. A large body of empirical evidence supports the idea that the quality of the neighbourhood has an effect on people's mental health (Diez Roux & Mair, 2010). Furthermore, overcrowding (a high number of people per room), independently of social class, is associated with

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