Parenting and Professional Childcare in Chile

Relations with Child Developmental Outcomes in Preschoolers

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To my parents, who gave me roots and wings
and taught me how to think

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Chapter 1

General Introduction

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Juanita is born to her teenage parents Alejandro and Ana Maria who are indigenous Mapuche in the south of Chile. Alejandro's family encourages him to take responsibility for the child, and his romantic feelings for Ana Maria do not allow him to abandon her, although he feels utterly unprepared for fatherhood and had different plans with his life. He starts to work as a taxi driver six days a week to support his family. His minimum wage is not enough, however, to pay rent and provide for the child and her mother, so he stays at his parents' house in a rural area not far from the city. Ana Maria could not finish secondary school due to her pregnancy and continues to live in social housing on the outskirts of the city with her mother Rosa who is a single mother of four children. Rosa tries to provide for her growing family by selling home-made food on the street. Juanita is raised by her mother, grandmother and aunt (Ana Maria's slightly elder sister Carla), who also has a child 'without a father'; Carla's daughter Esperanza just turned three. Ana Maria and Carla are from their mother's first partner, whereas their two much younger half-brothers (Claudio 7 and Roberto 5) are from Rosa's last partner. Baby Juanita only sees her father once a week on his day off. Over the months the young couple slowly grows apart, and with a heavy heart Alejandro finally quits his relationship with Ana Maria when Juanita is one and a half. He has grown fond of his daughter and regrets having failed as a father. The family mediation center determines the monthly alimony and visiting hours for the father (four hours in the afternoon, every second Saturday). Ana Maria feels alone, over-burdened, angry, and depressed. After an adjustment period following the separation Ana Maria enrolls Juanita (aged 2) in a childcare center, so she can take a free sewing course offered by the government for the most vulnerable members of society. Upon completion of the course Ana Maria finds employment at a local tailor's shop where she works long days to make ends meet. Juanita spends her early childhood mostly in full time public childcare or with her grandmother and aunt. Juanita enjoys playing with her cousin Esperanza and her half-uncles Claudio and Roberto. On the weekends Ana Maria has more time with her daughter and they play or go for a walk together. Juanita grows up in a bad neighborhood and is not allowed to play outside. Her preschool is of low quality and Juanita's classmates come from socially vulnerable homes as well, characterized by low educational levels, low income, unemployment, single parenthood, patchwork families, violence, substance use, and crime. Juanita's school trajectory is beset with many obstacles (e.g. discrimination due to being indigenous, insufficient parental support and supervision, bad grades, loss of interest in school, wrong friends). She too will be a teenage mother and grow up to be an adult without opportunities. This is how the cycle of poverty is perpetuated from generation to generation.

Introduction

Children's progress in their cognitive development and socioemotional adjustment across the preschool period lays the foundation for their life course trajectories (Smith, 2001). Failure or success in life thus depend to a great extent on early child development, which in turn is determined by a complex interplay of genetic and environmental factors (Sameroff, 2010). As environmental factors are more mendable and hence more suitable for interventions, the present study investigates whether preschool children's two main socialization environments - home and childcare - affect their development. Research consistently shows that higher quality caregiving environments provided by parents and childcare professionals lead to more favorable child outcomes (Bradley & Corwyn, 2005; Burchinal & Cryer, 2004). Contextual factors such as the family's socioeconomic and cultural background are also known to shape child developmental opportunities (Bornstein, 1995; Grantham-McGregor et al., 2007). The accumulation of multiple environmental inequities represents additional challenges for the developing child (Evans, 2004). This is in line with the Family Investment Model and the Family Stress Model, positing that economic hardship leads to lower quality parenting, which in turn affects child developmental outcomes unfavorably (Conger & Donnellan, 2007).

The vast majority of studies on the interrelations between children's socialization environments and their developmental outcomes have been conducted in Western contexts (Henrich, Heine, & Norenzayan, 2010). However, it is unclear whether the commonly found relations between socialization processes and child outcomes can be replicated in non-Western populations, which are characterized by generally poorer living conditions and different ethnic backgrounds. The current dissertation addresses this knowledge gap by investigating the role of socialization environments in preschool children's cognitive development and socioemotional adjustment in the Latin American cultural context of Chile (in a bi-ethnic, low-SES sample).

Child Development across the Preschool Years

During the preschool period marked progress occurs in the cognitive and socioemotional domains in normally developing children. Children's vocabulary rapidly advances from knowing 900 words at age 2 to 10,000 words by age 6 (Carey, 1978; Slobin, 1978). Significant changes also occur with respect to

executive functions (EFs). Children are able to hold information in mind, inhibit responses, and change perspectives (Diamond, 2002). Moreover, abilities begin to emerge in areas related to early literacy (phonological awareness, knowledge of the alphabet, print knowledge, text comprehension, early reading and early writing) and early math (numeral identification and number sense) (Jordan, Kaplan, Locuniak, & Ramineni, 2007; Purpura, 2009; Whitehurst & Lonigan, 1998). These abilities prepare preschoolers for elementary school. Changes also occur in the socioemotional domain. Preschool children gradually acquire prosocial behavior; they develop empathy and start to demonstrate helping and sharing behavior (Eisenberg, 2003). Furthermore, emotion regulation emerges which allows adaptive social and academic functioning (Bridges, Denham, & Ganiban, 2004). When children have deficits in their emotion regulation, it becomes manifest in problematic behavior. Some children show externalizing behavior, whereas others show internalizing behavior. Externalizing children act on their immediate impulses and behave disruptively and aggressively, whereas internalizing children are socially inhibited, fearful, and depressed. Children's progress in these developmental domains depends on the socialization context in their home and childcare environments.

Socialization Environments

The literature emphasizes the critical role of socialization environments for child development during the first years of life (Bradley, & Corwyn, 2005; Burchinal, & Cryer, 2004). Socialization refers to the process whereby a child is taught the knowledge, skills, behavior patterns, values, beliefs, and practices needed for competent functioning in the culture in which the child is growing up (Grusec, & Hastings, 2014). Bronfenbrenner's (2005) bioecological framework can help us understand how the child's biological characteristics, proximal processes (family and childcare) and more distal processes (cultural and economic contexts) contribute to the child's development. The child's caregivers act as socialization agents, and hence, due to proximity the child's home and childcare are typically the two most influential socialization environments.

Parenting. Parenting practices and beliefs are fundamental to understanding early child development. Parents provide the physical and psychosocial environments for learning. The physical dimension is reflected in the size,

cleanliness, and safety of the home setting and the availability of learning materials for the child. The psychosocial dimension finds expression in the provision of cognitive and linguistic stimulation, interpersonal warmth, and responsive caregiving, and in the richness of learning experiences offered to the child (Caldwell & Bradley, 2003). The higher the quality of the home environment, the more favorable child outcomes tend to be (Davis-Kean, 2005). The quantity of parental care is also likely to affect developmental child outcomes. The tool kit of a skilled parent, however, additionally includes supportiveness and disciplining strategies. The term *supportiveness* originates from attachment theory and indicates a parent's ability to respond sensitively to the child's signals (Ainsworth, 1985). The concept of *discipline* on the other hand derives from Baumrind's authoritative parenting style (1971) and refers to the parent's ability to positively control the child's behavior. The combination of these two parenting practices results in the concept of supportive discipline. Children benefit from parents who practice supportive discipline (Chazan-Cohen et al., 2009; Rhoades, Greenberg, Lanza, & Blair, 2011). Another important predictor of child outcomes is parental self-efficacy, which is defined as beliefs parents hold of their capabilities to execute a set of parenting tasks (Montigny & Lacharité, 2005). Self-efficacy beliefs affect caregiving through cognitive, motivational, affective and selection processes (Bandura, 1993, Montigny & Lacharité, 2005). Hence, parental functioning can either be enhanced or impaired by perceptions of self-efficacy.

Professional Childcare. According to a recent survey (CASEN, 2015), the childcare enrollment rate of Chile for preschoolers aged between 4 and 5 years is 90 %. Children attend childcare from Monday to Friday for at least 4 hours per day. In the absence of government regulations, preschools are free to determine their own schedule: many preschools offer 6 to 8 hours a day, and extended schedules exist for working mothers. Thus most preschool-aged children spend a considerable part of their young lives away from home in preprimary education. Children's developmental opportunities partly depend on the physical infrastructure of the preschool, the availability of books, toys, and learning materials; the quality of caregiving and social interactions with caregivers and peers; and the variety of physically, cognitively, linguistically, and artistically stimulating activities offered (Harms, Clifford, & Cryer, 1998; NICHD ECCRN, 2005). Children's caregiving experiences at home

and in childcare are also influenced by more distal contextual factors such as socioeconomic status (SES) and culture (Bronfenbrenner, 2005).

The Socioeconomic Context of Chile. Chile is of particular interest in the context of poverty and child development, because the economic inequity in Chile is one of the highest in the world as indicated by a Gini coefficient of 50.45 in 2013, which represents the income distribution of a nation's residents (World Bank, n.d.). Moreover, 45% of Chilean students are unable to attain basic skills (as reflected in the exams of the Program for International Student Assessment, PISA), that are considered minimum prerequisites for participating productively in modern economies (OECD, 2015). Consequently, 71% percent of the Chilean adult population have no post-secondary schooling (CASEN, 2013a), and 81% of Chile's working and tax-paying population earn an average of US$ 338 per capita per month (López, Figueroa, Gutiérrez, 2013). The unemployed, poor peasants, street vendors, and casual workers were not included in this study. To fully understand the magnitude of these figures, it is important to note that the minimum wage in Chile in 2017 was US$ 400 (264,000 CLP); this means that the vast majority of Chileans earn too little to make a decent living for their families (Chilean Ministry of Labor, 2017).

The social class distribution according to monthly per capita income is as follows: 16% of Chileans belong to the upper class (>US$ 695), 18% belong to the middle class (US$ 390-694), 29% belong to the lower middle class (US$ 203-389) and 37% to the lower class (<US$ 202) (AIM, 2015). The distinction between the middle class and the lower class is very small. The precarious economic position of middle-class citizens makes them vulnerable to social decline due to illness, unemployment, or insufficient provision after retirement. Moreover, 20.4% of the Chileans live in conditions of multidimensional poverty, indicating not only insufficient income, but also deficiencies in the areas of education, health, work, social security, and housing (CASEN, 2013b). Troublingly, these social conditions are reflected not only in disadvantaged child-rearing home environments for the vast majority of Chilean children, but also in lower quality childcare and school facilities. Access to good quality education is reserved for a small percentage of affluent and privileged families (OECD, 2015). Science and society alike are in debt; the prospects of hundreds of thousands of Chilean children are bleak, because their families are trapped in the vicious circle of socioeconomic adversity. According to OECD

recommendations, adequately preparing children for school during the highly formative years of early childhood is key to Chile's long-term economic success (OECD, 2015). Preschoolers' school readiness, encompassing cognitive abilities and social emotional adjustment, hence deserves special research attention due to the far-reaching consequences for Chile and Chilean citizens alike.

Aim and Outline of this Dissertation

The current study constitutes the second wave of the longitudinal Magellan-Leiden Childcare Study, which was initiated in 2012 with 110 mothers and their infants born between May and October 2011 (Cárcamo, Vermeer, Van der Veer, & Van IJzendoorn, 2015). The sample was recruited in the south of Chile and consisted of low-SES families from two different ethnic groups (Mapuche indigenous minority or Chilean majority). The mother and child dyads were first visited in February 2012 when the children were 6 months old (Time 1) and revisited when children were 15 months old (Time 2). The first wave of the study investigated the interrelations between social disparities, ethnic differences, parental child-rearing practices, and child attachment. The focus was on the children's caregiving environments and their socioemotional development in infancy. The second wave included home visits at Time 3 (mean child age of 42 months) and at Time 4 (mean child age of 61 months) and examined whether SES, ethnicity, parenting, and childcare were related to children's EFs, school readiness, language acquisition, and socioemotional adjustment. In other words the follow-up study focused on children's home and professional caregiving environments and their cognitive development and socioemotional adjustment across the preschool period.

The general aim of this dissertation is to shed light on the role of the home environment, parenting processes, professional childcare, and contextual factors in explaining individual differences in preschool children's early cognitive development and socioemotional adjustment. Investigating the relation between socialization environments and child developmental outcomes of low-SES children from indigenous Mapuche minority and Chilean majority background in Chile can yield valuable insights about how best to support the development of these at-risk children. After the general introduction in Chapter 1, Chapter 2 gives a historical review of child-rearing and education in Chile. The history of European settlers, emerging Chilean culture, and traditional and

modern Mapuche indigenous culture are discussed to provide a context for current child development and caregiving environments. Chapter 3 is devoted to the interrelations between SES, the quality of the home environment and preschool children's receptive and expressive vocabulary acquisition in Chile. Furthermore, we examined the mediating role of the quality of the home environment between SES and receptive and expressive vocabulary outcomes. Chapter 4 focuses on the role of SES, maternal self-efficacy, supportive discipline, and parental cognitive stimulation in predicting preschool children's school readiness and executive functioning in Chile. In addition, we explored whether the associations between SES and school readiness and EFs are mediated by parenting beliefs and behaviors. Chapter 5 reports on SES, ethnicity, child EFs, quality of the home environment, quantity of maternal care, quality of childcare, and quantity of childcare as predictors of preschoolers' problem behavior, prosocial behavior, and receptive and expressive language acquisition. Finally, in Chapter 6 the main findings of all three studies are reviewed and integrated. Limitations, suggestions for future research, and implications are discussed.

References

AIM Asociación de Investigadores de Mercado. (2015). Informe sobre la actualización grupos socioeconómicos [Report about the update of socioeconomic groups]. Retrieved from http://www.aimchile.cl/descargue-aca-el-estudio-completo-sobre-nuevo-modelo-de-grupos-socioeconomicos

Ainsworth, M. D. (1985). Patterns of infant-mother attachments: antecedents and effects on development. *Bulletin of the New York Academy of Medicine*, *61*, 792–811.

Bandura, A. (1993). Perceived self-efficacy in cognitive development and functioning. *Educational Psychologist*, *28*, 117–148.

Baumrind, D. (1971). Current patterns of parental authority. *Developmental Psychology*, *4*, 1–103.

Bornstein, M. H. (1995). Form and function: Implications for studies of culture and human development. *Culture & Psychology, 1*, 123–137.

Bradley, R. H., & Corwyn, R. F. (2005). Caring for children around the world: A view from HOME. *International Journal of Behavioral Development, 29,* 468–478.

Bridges, L. J., Denham, S. A., & Ganiban, J. M. (2004). Definitional issues in emotion regulation research. *Child Development, 75*, 340–345.

Bronfenbrenner, U. (2005). *Making human beings human: Bioecological perspectives on human development*. Thousand Oaks, CA: Sage.

Burchinal, M. R., & Cryer, D. (2004). Diversity, child care quality, and developmental outcomes. *Early Childhood Research Quarterly*, *18*, 401–426.

Caldwell, B. M., & Bradley, R. H. (2003). *Home observation for measurement of the environment: Administration manual.* Little Rock, AR: University of Arkansas.

Cárcamo, R. A., Vermeer, H. J., Van der Veer, R., Van IJzendoorn, M. H. (2015). Childcare in Mapuche and non-Mapuche families in Chile: the importance of socioeconomic inequality. *Journal of Child and Family Studies, 24*, 2668–2679.

Carey, S. (1978). The child as word learner. In M. Halle, J. Bresnan, & G. A. Miller (Eds.), *Linguistic theory and psychological reality* (pp. 264-293). Cambridge, MA: MIT Press.

CASEN - Ministry of Social Development. (2013a). The Situation of poverty in Chile. Retrieved from http://observatorio.ministeriodesarrollosocial.gob.cl/documentos/Casen2013_Situacion_Pobreza_Chile.pdf

CASEN - Ministry of Social Development. (2013b). Quintiles in Chile defined for 2015. Retrieved from http://noticias.universia.cl/cultura/noticia/2015/10/29/1132999/quintiles-2015-cuales-sirven.html

CASEN - Ministry of Social Development. (2015). Development report 2015. Retrieved from http://www.ministeriodesarrollosocial.gob.cl/pdf/upload/IDS2.pdf

Chazan-Cohen, R., Raikes, H., Brooks-Gunn, J., Ayoub, C., Pan, B. A., Kisker, E. E., ... & Fuligni, A. S. (2009). Low-income children's school readiness: Parent contributions over the first five years. *Early Education and Development*, *20*, 958–977.

Chilean Ministry of Labor (2017). Retrieved from http://www.dt.gob.cl/consultas/1613/w3-article-60141.html

Conger, R. D., & Donnellan, M. B. (2007). An interactionist perspective on the socioeconomic context of human development. *Annual Review of Psychology, 58*, 175–99.

Davis-Kean, P. E. (2005). The influence of parent education and family income on child achievement: the indirect role of parental expectations and the home environment. *Journal of Family Psychology*, *19*, 294–304.

Diamond, A. (2002). Normal development of prefrontal cortex from birth to young adulthood: Cognitive functions, anatomy, and biochemistry. In D. Stuss & R. Knight (Eds.), *Principles of frontal lobe function* (pp. 466 – 503). New York: Oxford.

Eisenberg, N. (2003). Prosocial behavior, empathy, and sympathy. In *Well-being: Positive Development Across The Life Course*. Mahwah, NJ: Erlbaum.

Evans, G. W. (2004). The environment of childhood poverty. *American Psychologist*, *59*, 77–92.

Grantham-McGregor, S., Cheung, Y. B., Cueto, S., Glewwe, P., Richter, L., Strupp, B., & International Child Development Steering Group. (2007). Developmental potential in the first 5 years for children in developing countries. *The Lancet*, *369*, 60–70.

Grusec, J. E., & Hastings, P. D. (Eds.). (2014). *Handbook of socialization: Theory and research*. Guilford Publications.

Harms, T., Clifford, R. M., & Cryer, D. (1998). *Early Childhood Environment Rating Scale-Revised*. New York: Teachers College Press.

Henrich, J., Heine, S. J., & Norenzayan, A. (2010). The weirdest people in the world? *Behavioral and Brain Sciences 33,* 61–135.

Jordan, N. C., Kaplan, D., Locuniak, M. N., & Ramineni, C. (2007). Predicting first-grade math achievement from developmental number sense trajectories. *Learning Disabilities Research & Practice*, *22*, 36–46.

López, R., Figueroa, E., & Gutiérrez, P. (2013). La 'parte del león': Nuevas estimaciones de la participación de los súper ricos en el ingreso de Chile. [The 'lion's share': New Estimations of the participation of the super-rich in the income of Chile]. *Serie de Documentos de Trabajo*, *379*, 1–31.

Montigny, F., & Lacharité, C. (2005). Perceived parental efficacy: Concept analysis. *Journal of Advanced Nursing*, *49*, 387–396.

NICHD Early Child Care Research Network (Ed.). (2005). *Child care and child development: Results from the NICHD study of early child care and youth development*. Guilford Press: NY.

OECD. (2015). OECD Economic Surveys: Chile 2015, OECD Publishing, Paris. Retrieved from http://www.oecd-ilibrary.org/economics/oecd-economic-surveys-chile-2015_eco_surveys-chl-2015-en

Purpura, D. J. (2009). Informal number-related mathematics skills: An examination of the structure of and relations between these skills in preschool. Unpublished dissertation, Florida State University.

Rhoades, B. L., Greenberg, M. T., Lanza, S. T., & Blair, C. (2011). Demographic and familial predictors of early executive function development: Contribution of a person-centered perspective. *Journal of Experimental Child Psychology, 108*, 638-662.

Sameroff, A. (2010). A unified theory of development: a dialectic integration of nature and nurture. *Child Development, 81*, 6–22.

Slobin, D. I. (1972). Children and language: they learn the same way all around the world. *Psychology Today*, 6, 71–82.

Smith, D. W. (2001). Developmental milestones in children. *Current Therapeutics, 42*, 61.

Whitehurst, G. J., & Lonigan, C. J. (1998). Child development and early literacy. *Child Development, 69,* 848–872

World Bank, (n.d.) Retrieved from http://data.worldbank.org/indicator/SI.POV.GINI?locations=CL

Chapter 2

Historico-Cultural Background of Child-Rearing and Education in Chile

Chile is a Latin American country, home to both several indigenous peoples and descendants of European immigrants. In the 2012 Census, 11% of the national Chilean population categorized themselves as indigenous. The indigenous Mapuche people constitute the largest minority group, comprising 9% of the national population (one and a half million people) (INE, 2012). Below we will present a brief historical review of child-rearing and education in Chilean and Mapuche culture, to outline the historico-cultural and socioeconomic context for current child caregiving experiences provided by parents and professionals, and the related child-developmental outcomes. Given the scarcity of historic accounts of family child-rearing practices, we were compelled to focus mostly on formal education as an indicator for child caregiving experiences.

Child-rearing and Education in Chile: A Brief Historical Review

Colonial era (1540 – 1810). From 1540–1810, the geographic territory of the current nation of Chile was a Spanish colony. In the colonial period education was mostly in the hands of the Roman Catholic church (Aedo-Richmond, 2000). In the beginning priests took individual initiatives to educate the children under their care, and the main purpose of education was the indoctrination of the indigenous in Spanish culture, language, and religion. These initiatives naturally met with opposition. In later periods educational efforts were somewhat more systematic, and a number of schools were created in the likeness of those in Spain (Aedo-Richmond, 2000). Boys were taught mathematics, reading, writing, and religion, whereas girls were typically taught domestic chores; prayer was taught with great vigor to both sexes. These schools were frequently criticized, however, due to the dreadful conditions of their infrastructure, the strict discipline, cruel physical punishment, and the deficient teaching provided, mostly consisting of repetition and memorization. Not surprisingly very few children attended schools.

During the colonial era the *hacienda* system was installed, which was a system of large land holdings (Aedo-Richmond, 2000). As a consequence, for centuries (17th to first half of 20th century) Chile's social structure was characterized by two classes: master (*patrón)* and man (*peón*); in other words landowners (the Spanish and their descendants '*criollos*') and workers (natives or mestizos). The workers raised stock and worked the land without monetary remuneration; they received only housing, food, and clothing for their labor. The children of the 'masters' (upper class) were educated in their homes and subsequently

often studied at the Latin school in preparation for higher education at one of the two existing Catholic colonial universities in Santiago (which offered theology, art, mathematics, philosophy, medicine, and law) or were sent to Europe for education. Higher education was an essential requirement for the sons of the aristocrats in Chile in order to obtain an ecclesiastical, military, or administrative authority position. Children of the 'men' (lower class), on the other hand, learned by observation and instruction from their parents. In this way, they acquired the knowledge and skills necessary for the perpetuation of their social position. In the absence of alternatives, the same families often stayed with the same master for generations (e.g. in case of slavery).

The Republic of Chile (1810 – 1973). Independence of the Spanish crown was gained in 1810 and the Republic of Chile was founded. The government of the Republic was more interested in formalizing education. However, the influence of the church has remained strong until the present day (according to Passalacqua, 2006, 15% of all Chilean schools were Catholic in 2002). In 1813 an ambitious decree was issued, called *Regulations for Teachers of Initial Letters* (Reglamento de Maestros de Primeras Letras, 1813) stating that every city, village, or settlement with more than 50 inhabitants should have a primary school; the implementation of this decree, however, proved to be highly unrealistic. Education was free and hence accessible to the poor. Girls also had the right to education, but boys and girls were instructed separately in single-sex schools (until mixed schools were introduced seventy years later). The main aim of the primary schools, apart from teaching children reading, writing, and arithmetic, was to inculcate good habits and produce virtuous and useful citizens.

The creation of "Normal Schools" and the first law of primary education. In 1842 "Normal Schools" were created with the objective of training primary teachers nationwide. This was the beginning of a longstanding tradition (1842-1974) of rigorous and effective teacher training, which greatly contributed to the development of the country (Ávalos, 2003). The first census in Chile in 1854 detected that fewer than 10% of school-aged children attended school, and that only 13.5% of Chileans knew how to read and write (INE, 1854). In 1860 the General Law of Primary Education was adopted in Chile, which established a public school system and positioned the state at its head as

provider and supervisor of education (Aedo-Richmond, 2000). Education was free of charge and universally accessible (boys and girls, rich and poor). This law marked an important milestone in Chilean education, but its implementation was laborious and slow. The great geographic dispersion of the population along the 4,000 km from north to south and from the pacific coast in the west to the Andes mountains in the east naturally made extending school coverage a highly challenging undertaking. Low population density, high rurality, and resistant indigenous communities constituted further obstacles. It was not feasible to build schools in rural sectors for very few children. Moreover the government was faced with social difficulties inherited from colonial times. The elite were not motivated to send their children to school with children of proletarians, and the rural populations (especially indigenous families) showed little interest in sending their children to school at all, since the knowledge and skills taught were mostly irrelevant for agriculture, and the children were needed at home for the daily chores. Nonetheless the state started to build schools and managed to increase the amount of primary schools from 486 in 1860 (serving 23,883 students) to 2,099 in 1905 (serving 159,379 students) (Salas, 1917).

Preprimary education – the beginnings. In 1863, preprimary education for preschool-age children was legally established in the constitution (MINEDUC, 2001). In the beginning it was offered by religious orders. Its character was very rudimentary, and it was reserved for isolated cases such as child abandonment, orphanhood or extreme poverty. Its principal role was that of child custody in cases where the family was not available or able to provide care. At the beginning of the 20th century the first preprimary educators were trained in the first preschool teacher training institute (1905), and curricula were formulated that specified central pedagogical tasks in line with the European work of Froebel, Montessori and Decroly (Gálvez, 2000). Gradually the training of educators was expanded, and the first private kindergartens (playgroups) with a pedagogical mission were opened. The government of Chile inaugurated the first public kindergarten in Santiago in 1906, which was attended by upper middle class children, and the first "people's kindergarten" made educational services accessible to less wealthy families in 1911 (Alarcón, 1996). One key person made significant contributions to this process: Leopoldina Maluschka, an Austrian kindergarten teacher. At the turn of the 20th century, she was invited by a government representative in charge of the educational system of

the time to help set up kindergartens in Chile (MINEDUC, 2001). She had an active role in promoting the importance of preprimary education, building up the first kindergartens and training the first kindergarten teachers according to the Froebel method. Within a few years preschool education began to spread from the capital to the provinces, but this impetus ground almost entirely to a halt due to World War I one and the great depression. These endeavors were resumed, however, in the 1940s, however, when the Universidad de Chile created the first preschool teacher training (including philosophy, psychology, and pedagogy) and gained momentum in 1948 when the Ministry of Education established the first Plan and Program of Studies oriented toward preschools (Fleming, 2007).

Law of Obligatory Primary Schooling and school coverage expansions. Despite all efforts by the government to achieve universal school coverage, half a century after the passing of the General Law of Primary Education roughly two thirds of all Chilean children still did not receive any education at all (the school enrollment rate in 1907 was 37.5%), and accordingly 60% of the population were still illiterate (Aedo-Richmond, 2000). To remedy this situation the Law of Obligatory Primary Schooling was adopted in 1920, stating that all Chilean children must attend four years of primary education before they turned thirteen. In the case of noncompliance with the law, parents were liable for prosecution (Aedo-Richmond, 2000). In the 1930s public education established itself as an institution of excellence due to the teacher training of the Normal Schools. President Pedro Aguirre Cerda (1938-1941), who was himself a teacher, placed special emphasis on fighting poverty, and to this end he promoted education for all. Faithful to his slogan "*to govern is to educate*" he contributed greatly to the expansion of school coverage by building 500 schools and increasing the number of students enrolled almost sixfold. In the 1960s primary school coverage was substantially expanded to 90%, and in 1970 literacy reached 88% (Pérez Navarro & Silva Salina, 2013). To meet the rapidly increasing demand for teachers, the teacher training was accelerated; this training was incomplete, and the teachers of this epoch were nicknamed "*marmicoc* teachers" (referring to a popular brand of pressure cookers). The abrupt expansion in quantity entailed a loss of quality.

The creation of JUANEB, JUNJI, and expansion of preschool teacher training. In 1964 JUNAEB (the National Council of School Assistance and Scholarships) was created with the objective of administering state resources destined for socioeconomically vulnerable children and young people to enable them to enter the school system, remain in education and finish school successfully. In 1970, JUNJI (the National Council of Childcare Centers) was created as an independent unit linked to the Ministry of Education. Its objective was to provide high-quality preprimary education (0-4 years) for socially vulnerable children in the two lowest quintiles of Chilean society, in order to contribute to the equality of opportunities (Alarcón, Castro, Frites, & Gajardo, 2015). JUNJI took charge of providing and regulating preprimary education and started to organize the educational training of preprimary teachers. It elaborated educational programs according to child-developmental needs; this was the first time attempts were made to achieve national coherence. JUNJI continues to play a key role in preprimary education to the present day (Cortázar, 2012). Simultaneously during the 1970s the Universidad de Chile expanded the preschool teacher training programs throughout the country. These efforts were joined by the Universidad de Concepción, the Pontifical Catholic University of Temuco, and the Austral University (Fleming, 2007).

Dictatorship (1973 – 1990). Under the military dictatorship headed by General Pinochet, education was not a political priority: the regime cut back educational investments to one third of the prior budget. As a result many advances of previous decades were lost due to a lack of funding (Valenzuela, Labarrera, & Rodriguez, 2008).

Preprimary education. In 1975 the country's First Lady founded the National Foundation of Community Help FUNACO (Fundacion Nacional de Ayuda a la Comunidad). FUNACO's main concerns were to provide health and nutritional services to vulnerable children, prioritizing malnourished children with a background of poverty (Cortázar, 2012). FUNACO's services were offered by early childhood assistants and volunteers. The MINEDUC (Ministry of Education) made qualitative improvements by elaborating educational programs for the transitional level (1974) and nursery schools (1979), in which they established an active role for the children in their learning process from birth onward (Fleming, 2007). These positive developments, however,

should not conceal the fact that educational disparities structurally increased due to SES-dependent access to childcare services. Children from low-SES backgrounds received childcare provided by unprepared staff, with no emphasis on their developmental needs, whereas their higher SES counterparts had access to childcare programs, provided by professional educators, that stimulated their social and cognitive development (Cortázar, 2012).

Primary, secondary, and tertiary education. During the dictatorship teachers lost their public employee status, and the military regime, faithful to its predominantly neoliberal ideology, delivered the school system to the free market governed by supply and demand (Gómez Leyton, 2003). The state was left with only a "subsidiary role". A system was created with three different types of school establishments: 1) public, 2) private-subsidized, and 3) private. This reform was supposed to kill two birds with one stone: to increase school coverage and improve the quality of education. It was expected that the force of the market – the competition of the schools for students and subsidy and the free choice of the parents – would achieve this aim, but this proved to be a fallacy. Furthermore, in 1974, after a 132-years tradition of excellence in providing teacher training nationwide, the "Normal Schools" were dissolved; in 1981 the military regime shut down the Faculty of Education of the Universidad de Chile (Gimeno, 2014). To make matters worse, the DFL-1 law adopted by the military regime in 1980 (which paradoxically is still in effect) has also left tertiary education at the mercy of the market. As a result, in the 1980s there was an explosion of private universities and private vocational schools, often offering education of questionable quality (Fleming, 2007). These unprepared institutions were left in charge of training Chile's future teachers, and consequently the quality of teacher training suffered greatly. Teachers lost their social, professional, and economic status, and this condition endures to the present day.

The return of democracy (1990 – present). In 1989, Chile signed up to the UN Convention on the Rights of the Child, which influenced central aspects of public policy throughout the following decade (Fleming, 2007). The post-dictatorship governments declared education a fundamental priority for strengthening social equality and the developing the country. Chile committed itself to promoting children's rights, increasing access to preprimary childcare

services, and improving the quality of early childcare services. This was certainly not an easy task, as at the end of the military regime most preprimary educational facilities were in an unfavorable condition due to financial cutbacks during the dictatorship: the infrastructure had deteriorated, and there were few educational materials or books (Cortázar, 2012).

INTEGRA. An important milestone for early childcare was the reestablishment of FUNACO in 1990. Its main objectives shifted from being a welfare organization to being an educational institution for socially vulnerable children. FUNACO was renamed INTEGRA (the National Network of Nursery Schools and Kindergartens). INTEGRA is a non-profit foundation, receiving public funding from MINEDUC (Ministry of Education), and is dependent on the Ministry of the Interior (Cortázar, 2012). INTEGRA is headed either by the First Lady or someone appointed by the president. INTEGRA offers center-based early childhood education free of charge for children from 3 months to 4 years from the two lowest quintiles of Chilean society (low-income families) and children who live in multiple social-risk conditions. Moreover, the organization provides nutritional services and works with children's families. At present, INTEGRA has a national curriculum with a strong emphasis on the pedagogical component.

Coverage and quality of education. Nevertheless, the arrival of democracy has brought relatively little relief to the educational system, as surprisingly many of the constitutional changes made during dictatorship continue to determine Chile's current educational system. A few things have changed, however: the state has partially recovered its role as head of the educational system and investments in education have increased (OECD, 2017). This increase in investment had some effect on the educational system. Preprimary childcare coverage has greatly expanded in the first two-and-a-half decades of democracy. In 1990, 16% of children (0-5 years) attended early childcare, whereas in 2015 this figure has more than tripled to 50.3 % (CASEN, 1990-2011).

Furthermore, coverage of primary education increased from 93% to 98% between 1990 and 2000 (and of secondary education from 74% to 85%), and the national literacy rate reached 96% in 2002. In contrast, improvements in educational quality, as measured by standardized tests, are not evident (Bellei, 2005). In sum, school coverage has increased as a consequence

of commercializing education during the military regime and increased investments by the post-dictatorship government. However, at present Chile is still struggling to improve the quality of education. Children and young people of the current generation suffer the aftermath of the military regime and regularly vent their frustration in national protests and strikes, demanding higher quality education at lower (or null) costs. So far this has only led to soft reforms, and no meaningful changes have occurred in primary and secondary education (Gómez Leyton, 2006).

Challenges of the Chilean educational system. In spite of Chile's advances in literacy, one quarter of 15-year-olds fall below proficiency level 2 on the PISA tests (Program for International Student Assessment) in reading, math, and science (Hudson & Kühner, 2016), which means that they experience difficulties understanding what they read, solving basic mathematical operations and reasoning about natural occurrences. Chile has the third lowest public education provision of all OECD countries. Only 37.5% of schools are public (compared to the OECD average of 82%); 48% are private-subsidized, and 14.5% are private (OECD, 2014). In Chile, public schools are attended by students from lower SES backgrounds, who achieve lower PISA scores than students from private schools (OECD, 2014). The threefold division of school establishments is the propelling engine behind Chile's social segregation and economic inequality and systematically impedes the closing of the gap between the social classes (Alarcón, Castro, Frites, & Gajardo, 2015; OECD, 2015). In this context it is noteworthy that, according to a OECD report (2017), at present public universities in Chile charge the second highest tuition fees in the OECD after the United States, charging US$ 7,654 for a bachelor's degree (or equivalent) (compared to U.S. fees of US$ 8,202). Only 15% of students enroll in public universities, however, and private universities charge only a little less for the education they offer (US$ 7,156).

Early childhood education programs. To counterbalance social inequity, Chile launched its flagship *Chile Grows With You* (Chile Crece Contigo) in 2007. This is an early childhood care and education program funded by the World Bank and consists of a set of policies guaranteeing that children from the poorest 60% of households have access to free healthcare and education from their prenatal stage until they enter primary school. Guaranteeing free access to preprimary

education for all socioeconomically vulnerable children in Chile appears to be a giant step in the right direction. However, given the dramatic expansion of this program over just a decade, naturally questions about the quality of the childcare experiences arise. Mere provision is not a sufficient criterion when addressing educational disparities; so far the impact of the program is unknown due to a lack of research and is most likely limited (Economist Intelligence Unit, 2012). The quality of the program needs to be evaluated to ensure the children involved actually benefit from the program, as compared with stay-at-home children, justifying the multi-million dollar investment by the government. To our knowledge the only study to evaluate the impact of early childcare experiences on Chilean children's 4th-grade academic achievement – as indicated by SIMCE (System of the Measurement of Educational Quality) test results in math, reading and social sciences – was conducted just before implementing the *Chile Grows With You* program was implemented (Cortázar, 2012). Data of 31,947 children who attended public childcare were compared with data of 54,577 children who did not attend public childcare. Results showed that there was a positive long-term effect of early public childcare for some children: children of the lower middle class benefited most, followed by children from the middle class. There was no effect, however, for children of the upper middle class and only a small effect for children of the lower class (only slight benefits in math). These findings show that so far the early childcare programs predominantly offered by JUNJI and INTEGRA, have accomplished only half of their mission, as they were especially designed to target educational inequities of lower class and of lower middle class children. These childcare programs did not show the desired outcomes for children from the poorest families of Chilean society (which constitute 20% of the national population). It is conceivable that the multiple-risk conditions in which low-SES children are growing up in do not allow them to reap the benefits of childcare programs. Future compensatory policy needs to tackle this issue.

Preprimary teacher training quality. Another important aspect of preschool education is teacher quality. It is reasonable to assume that low-quality preschool teacher trainings impacts the quality of preschool environments. National studies about the educational institutions that provide preschool teacher training reveal several worrisome deficiencies: these institutions have some of the lowest admission requirements of all university degrees in Chile;

the student-teacher ratio is insufficient; curricula are heterogeneous and lack cohesion; interdisciplinarity is scarce; education is competence-based and far removed from international standards of preschool teacher training; knowledge is not updated according to new (scientific) developments in the field and research is scarce; and very few specialization opportunities are available for the future preschool teachers (Alarcón, Castro, Frites, & Gajardo, 2015; Tokman, 2010). The implementation of quality standards in teacher training differs greatly from one university to the next and depends on available resources. Teacher training has been shown to be of lower quality in private universities than in state universities (Alarcón, Castro, Frites, & Gajardo, 2015). The deficiencies of the training are reflected in the results of a recent INICIA test (assessing teachers' competence), which demonstrated that 60% of freshly graduated preschool teachers did not have the necessary knowledge and skills to practice their profession adequately (Narea, 2014). Finally, once teachers enter the job market they can expect low average wages (Economist Intelligence Unit, 2012).

Governmental structural and process quality regulations. Chile does not have a national curriculum for preschools and quality standards are not sufficiently regulated (OECD, 2011). However, the government's concern for the quality of preschool education is reflected in the guidelines and regulations it provides. All publicly funded preschools need to comply with certain regulations, such as those concerning structural quality features (MINEDUC, 2011). According to decree 315, teaches are required to have a degree in education issued by a normal school, university, or technical school (4 years or more), and the teaching assistants must have earned the relevant diploma issued by a vocational school (usually 2 years). Moreover, the maximum number of children per classroom is 35 for preschool transition grade one (pre-k) and 45 for preschool transition grade two (k) (provided that there is at least one square meter per child). In both cases one teacher and one teaching assistant is required per group (MINEDUC, 2011).

Furthermore, in an attempt to improve the process quality of preschool education, at the beginning of the new millennium the Chilean Ministry of Education developed curricular guidelines for preschool education: Bases curriculares de la educación parvularia. Implementation was initially voluntary until, but in 2005 a law was passed that made implementation of the guidelines

obligatory for preschools to receive public funding. The preschool curricula for preschool transition grade one (48- 60 months) and preschool transition grade two (61-72 months) cover three important developmental domains of the child (MINEDUC, 2008a; MINEDUC, 2008b), which can further be divided into several subdomains: 1) Personal and social development: a) autonomy, b) identity, c) peaceful coexistence; 2) Communication: a) verbal language, b) artistic languages; 3) Relation to the natural and cultural environment: a) living beings and their environment, b) human groups, their way of life and relevant events, c) logical-mathematical relations and quantification. All in all, over the last century Chile has performed ground-breaking work in the area of preprimary education. The situation has evolved from a virtually complete lack of provision at this level to universal access and a nationwide infrastructure (including physical childcare facilities, guidelines and regulations, and teacher training institutions).

Child-rearing and Education of the Mapuche: A Brief Historical Review

Traditional Mapuche way of life. The ancestral lands of the Mapuche cover large parts of present-day Chile and Argentina. Archeological evidence reveals that the Mapuche have lived in the area for almost 3,000 years (Bengoa, 2003). Their native language, Mapudungun, was a spoken language without written form (Caniguan, 2012). Traditionally the Mapuche lived in thatched mud huts known as *ruka*, which they shared with their patrilocal extended family. Polygamy was common practice and the number of children per family was high to ensure survival, family alliances, and the population of the lands. The women did their daily domestic chores together (Montecino Aguirre, 1984). They were responsible for the household, child-rearing, and weaving. The father was responsible for affairs outside the home (agriculture and animals, fishing or hunting) and sustained the family.

In the traditional Mapuche family, infancy was spent in close proximity to the mother. Infants were attached to a cradle-board (*kulpülwe*) and placed in an upright position so they could always see their mother while she was working (Titiev, 1951). Childhood was a time of play, which took mostly the form of group games or active physical play outside the home. Children were seldom scolded or slapped. They were left free to do as they pleased, and few limits were set. Up to the age of six or seven children enjoyed complete freedom, after which they were taught to help the adults in their gender-related tasks (boys

were shepherds and worked in the fields; girls helped with cleaning, cooking, and weaving). These older children were raised by all members of the patrilineal group, with the paternal grandfather holding an authoritative role (Caniguan, 2012). From the age of seven, a boy was given counsel and instruction every evening by his grandfather (Cooper, 1946). Furthermore, emphasis was placed on physical hardening of boys. They bathed in cold rivers, slept outside, and received training in bearing arms, swimming, and horsemanship. Children learned by observation and imitation, through horizontal and affective relationships with adults. It was very common for children to work during the second half of their childhood, as the family members were united in their quest for survival. Mapuche cosmovision, cultural knowledge, traditions, legends, folk tales, social customs, and moral systems were passed on to the next generation orally by members of a family clan (*lof*), and especially boys had to memorize them. Each *lof* traditionally had a chief (*lonko)* and a medicine woman and religious leader called *machi* (Duhart, 2003).

The Mapuche adapting to modernity. The Mapuche have experienced drastic changes in their traditional way of life since the arrival of foreign people in their territories. Due to Spanish colonial power the Mapuche had to retreat to the south of Chile, suffering the first substantial territorial reduction. Nevertheless, an agreement was concluded stating that the new borders of the Mapuche territory had to be respected, and this allowed the Mapuche to maintain their independence for 300 years. In the late 19th century, however, this established equilibrium was abruptly disrupted by the Chilean state, when it launched the *Occupation of the Araucanía* region (1861–1883). The occupation consisted of a series of military campaigns and penetrations into Mapuche territory by the Chilean army and settlers and eventually led to the incorporation of the Araucanía region (the Mapuche stronghold) into Chilean national territory and the gradual acculturation of the Mapuche to the dominant culture. The disintegration of indigenous cultures generally follows a predictable pattern. Territorial expropriation and land reductions have deprived the Mapuche of the very basis of their existence (*Mapu-che* means people of the land). Subsistence farmers, hunters and fishermen with their own land, hunting grounds, and tools have gradually been transformed into wage laborers. Those who have managed to keep some land find themselves at the mercy of the free market economy. Meanwhile the dispossessed and the young leave their indigenous

communities in quest of work and survival in the city, only to become trapped in urban poverty (Hong, 1995). Territorial expropriation and rural exodus (two sides of the same coin) consequently also lead to a gradual eradication of the social structure of community and family affairs (Duhart, 2003). The breakup of traditionally strong family ties threatens the cultural transmission of Mapuche cosmovision and carries in its wake the inevitably intertwined loss of culture and language. Moreover, the abolition of polygamy by the Chilean state at the end of the 19th century made a gradual end to big families and family clans.

The Law of Obligatory Primary Schooling adopted in 1920 made attendance in a western school system mandatory for indigenous children. They were mainly accommodated in urban boarding schools, which implied prolonged separation from their families, culture, and native land (Williamson, Pérez, Modesto, Coilla, & Raín, 2012). In school all classes were conducted in Spanish and Mapuche children were punished for speaking their mother tongue Mapudungun (Soto, 2009). Ever since then Mapuche children have been educated in Spanish by teachers of a foreign culture, and this process has irrevocably undermined the intergenerational transmission of Mapuche culture and language. As a result, less than one hundred years after the introduction of the law of obligatory schooling, Mapudungun is spoken with high proficiency by only 3,8% of Mapuche youth aged between 10 and 19 in the south of Chile (the language's stronghold) (Sadowsky, Painequeo, Salamanca, & Avelino, 2013). At present, the vast majority of Mapuche are urbanized (50% live in Santiago and further 30% in other urban contexts) and are estranged from their own culture (Caniguan, 2012; Diaz Vidal, 2014). In the process of acculturation, most Mapuche have adopted the dominant culture, religion, housing, medicine, education, clothing, and nutrition, which makes them largely indistinguishable from Chileans of the same social class (Caniguan, 2012; Sadler & Obach, 2006). However, this should not obscure the fact that the Mapuche are overrepresented in the lowest deciles of the income distribution (Diaz Vidal, 2014).

References

Aedo-Richmond, R. (2000). *La educación privada en Chile: un estudio histórico-analítico desde el período colonial hasta 1990*. [The private education in Chile: a historical-analystical study from the colonial period until 1990]. Ril Editores: Santiago.

Alarcón, D. (1996). Evolución del concepto de educación parvularia en Chile desde 1906 a 1956. [Evolution of the concept of early childhood education in Chile from 1906 to 1956], *Revista Perspectiva, 2.*

Alarcón, J., Castro, M., Frites, C., & Gajardo, C. (2015). Desafíos de la educación preescolar en Chile: Ampliar la cobertura, mejorar la calidad y evitar el acoplamiento. *Estudios Pedagógicos (Valdivia)*, *41*, 287–303.

Ávalos, B. (2003). La formación docente inicial en Chile. *Santiago: Ministerio de Educación*.

Bellei, C. (2005). ¿Ha tenido impacto la reforma educativa chilena? En Cox, C. (Ed.) *Políticas educacionales en el cambio de siglo. La reforma del sistema escolar de Chile. [Educational policies at the change of the century. The reform of the school system in Chile]*. Santiago: Editorial Universitaria.

Bengoa, J. (2003). *Historia de los antiguos mapuches del sur. Desde antes de la llegada de los españoles hasta las paces de Quilín*. Editorial Catalonia: Santiago.

Caniguan, N. (2012). Infancia mapuche y migración en el Budi [Mapuche infancy and migration in the Budi]. *Revista Iberoamericana sobre Niñez y Juventud en Lucha por sus Derechos, 4,* 135–141.

CASEN – Ministry of Social Development. (1990-2011). *Encuesta de caracterización socioeconómica nacional.* [Survey of national socioeconomic characterization]. Retrieved from http://observatorio.ministeriodesarrollosocial.gob.cl/casen/basededatos.php

Cooper, J. M. (1946) *The Araucanians. In Handbook of South American Indians*. Vol.2. (p. 687-766). Smithonian Institution. U.S. Governmental Printing Office, Washington D.C., in Steward, J. H.

Cortázar, A. (2012). *Long-term effects of early childhood education on academic achievement in Chile* (Doctoral dissertation). Teachers College, Columbia University. Retrieved from ProQuest Dissertations and Theses database. (UMI No. 3492908)

Diaz Vidal, D. (2014), "Chile: Mobility among the Oligarchs", in Gregoy Clark, *The Son Also Rises: Surnames and the History of Social Mobility*, Princeton University Press.

Duhart, D. (2003). Programas sociales, partidos políticos y liderazgos familiares: erosión del capital social en una comunidad Mapuche. En Arriagada, I. & Miranda, F. (Eds.), *Capital social: potencialidades analíticas y metodológicas para la superación de la pobreza*, [Social programs, political parties, and family leadership: erosion of the social capital in a Mapuche community. In Arriagada, I. & Miranda, F. (Eds.), Social capital: analytical and methodological potentialities in overcoming poverty], pp. 269-284. CEPAL: Santiago. Retrieved from http://200.9.3.98/handle/11362/6608

Economist Intelligence Unit. (2012). *Starting well Benchmarking early education across the world*. Report commissioned by the Lien Foundation. Retrieved from http://www.lienfoundation.org/sites/default/files/sw_report_2.pdf

Fleming, Z. (2007). Historia Educación Parvularia [History of Preschool Education]. Universidad de Chile. Retrieved from http://www.uchile.cl/noticias/40985/historia-educacion-parvularia

Gálvez, I. (2000). La educación inicial en el ámbito internacional: Situación y perspectivas en Iberoamérica y en Europa. *Revista Iberoamericana de Educación, 22*, 119–154.

Gimeno, M. (2014). Cierre de las Escuelas Normales en Chile (1973-1974) [Closure of Normal Schools in Chile (1973-1974)]. In C. Silva Salinas (Ed.). *Cuadernos Chilenos de la Historia de la Educación [Chilean Notebooks of the History of Education]*. Santiago, Chile. Retrieved from http://www.historiadelaeducacion.cl/PDFs/Cuadernos_N_2_Versi%C3%B3n_final.pdf

Gómez Leyton, J. C. (2006). La rebelión de las y los estudiantes secundarios en Chile. Protesta social y política en una sociedad neoliberal triunfante. *Observatorio Social de América Latina, 20*, 107–116.

Hong, E. (1995). The impact of modernization on indigenous peoples: the case of the Sarawak. In Norberg-Hodge, H., Goering, P. & Gorelick, S. (Eds,), *The future of progress: Reflections on environment and development* (p.129-140). Foxhole, Dartington, Totnes, Devon: UK. Green Books.

Hudson, J. & Kühner, S. (2016). Fairness for Children. A league table of inequality in child well-being in rich countries (Unicef Innocenti Report Card 13), Florence: Unicef Innocenti Research Centre. Retrieved from: https://www.unicefirc.org/publications/pdf/RC13_eng.pdf

INE - Instituto Nacional de Estadísticas. (1854). *Resultados III Censo de Población* [Results III of the population census]. Santiago de Chile. Government of Chile. Retrieved from http://www.ine.cl/estadisticas/censos/censos-de-poblacion-y-vivienda

INE - Instituto Nacional de Estadísticas. (2012). *Resultados XVIII Censo de Población* [Results XVIII of the population census]. Santiago de Chile. Government of Chile. Retrieved from https://www.cooperativa.cl/noticias/site/artic/20130425/asocfile/20130425190105/resultados_censo_2012_poblacion_vivienda_tomosiyii.pdf

MINEDUC– Ministry of Education. (2001). La educación parvularia en Chile. [Pre-primary education in Chile]. Santiago de Chile: Litografía Valente Limitada. Retrieved from http://ww2.educarchile.cl/UserFiles/P0001%5CFile%5Ceduc_parvularia_en_chile.pdf

MINEDUC – Ministry of Education. (2008a). Educación Parvularia, Programa Pedagógico, Primer Nivel de Transición [Pre-primary Education, Pedagogical Program, First Transitional Level]. Santiago de Chile. Retrieved from http://www.curriculumenlineamineduc.cl/605/w3-propertyvalue-77553.html

MINEDUC – Ministry of Education. (2008b). Educación Parvularia, Programa Pedagógico, Segundo Nivel de Transición [Pre-primary Education, Pedagogical Program, Second Transitional Level]. Santiago de Chile. Retrieved from http://www.curriculumenlineamineduc.cl/605/w3-propertyvalue-77553.html

MINEDUC – Ministry of Education. (2011). Reglamenta requisitos de adquisición, mantención y pérdida del reconocimiento oficial del estado a los establecimientos educacionales de educación parvularia, básica y media. [Regulatory requirements of the acquisition, maintenance and loss of official state recognition for pre-primary, primary and secondary school establishments]. Retrieved from https://www.leychile.cl/Navegar?idNorma=1026910&idVersion=2012-05-18

Montecino Aguirre, S. (1984). *Mujeres de la tierra [Women of the earth]*. Arancibia Hermanos., Impresores. CEM-PEMCI.

Montigny, F., & Lacharité, C. (2005). Perceived parental efficacy: Concept analysis. *Journal of Advanced Nursing*, *49*, 387–396.

OCDE. (2011). *Mejores políticas para el desarrollo: Perspectivas OCDE sobre Chile.*, Paris: OECD Publishing. Retrieved from http://www.oecd-ilibrary.org/economics/mejores-politicas-para-el-desarrollo_9789264095755-es

OECD. (2014). *Education at a Glance 2014: OECD Indicators*, OECD Publishing, Paris. Retrieved from http://www.oecd-ilibrary.org/education/education-at-a-glance-2014_eag-2014-en

OECD. (2015). OECD Economic Surveys: Chile 2015, OECD Publishing, Paris. Retrieved from http://www.oecd-ilibrary.org/economics/oecd-economic-surveys-chile-2015_eco_surveys-chl-2015-en

OECD. (2017). *Education at a Glance 2017: OECD Indicators*, OECD Publishing, Paris. Retrieved from http://www.oecd-ilibrary.org/education/education-at-a-glance-2017_eag-2017-en

Passalacqua, A. (2006). ¿Cuantos *somos? ¿Cómo lo hacemos? Estadísticas Educación Católica* Chilena.[How many are we? How do we do it? Statistics of Chilean Catholic Education?] Santiago de Chile: Fedeucech. Retrieved from http://www.opech.cl/bibliografico/Doc_Financiamiento/cuantos_somos_como_lo_hacemos.pdf

Pérez Navarro, C. & Silva Salina, C. (2013). Educación y proyectos desarrollistas: Discursos y prácticas de alfabetización popular en Chile, 1960-1970 [Education and developmentalist projects: discourse and practice of the popular alphabetization in Chile, 1960-1970]. In Cuadernos Chilenos de la Historia de la Educación [Chilean Notebooks of the History of Education]. C. Silva Salinas (Ed.). Santiago, Chile. Retrieved from http://www.historiadelaeducacion.cl/PDFs/Cuadernos_N1_Versi%C3%B3n_final.pdf

Reglamento de Maestros de Primeras Letras (1813). [Regulations for Teachers of Initial Letters]. Retrieved from http://www.historia.uchile.cl/CDA/fh_article/0,1389,SCID%253D1884%2526ISID%253D149%2526JNID%253D9,00.html

Sadler, M., & Obach, A. (2006). *Pautas de crianza mapuche. Estudio significaciones, actitudes y prácticas de familias mapuches en relación a la crianza y cuidado infantil de los niños y niñas desde la gestación hasta los cinco años. [Guidelines for Mapuche education. Study of the meaning, attitudes, and family practices of the Mapuche in relation to child-rearing and childcare of boys and girls from birth to five years]*. Chile: CIEG, Universidad de Chile y CIGES, Universidad de La Frontera.

Sadowsky, S., Painequeo, H., Salamanca, G., & Avelino, H. (2013). Mapudungun. *Journal of the International Phonetic Association, 43*, 87–96.

Salas, D., (1917*). El Problema Nacional. Bases para la reconstrucción de nuestro sistema escolar primario [The National Problem. Fundations for the reconstruction of our primary school system].* Cámara Chilena de la Construcción, Pontificia Universidad Católica de Chile y Dirección de Bibliotecas, Archivos y Museos, Santiago, Chile, 2011. https://de.scribd.com/doc/219778602/89553258-Dario-Salas-El-Problema-Nacional-1917-Chile

Soto, E. (2009). *La escolarización de los mapuche de Chile y la nueva mirada del estado [Schooling of the Mapuche in Chile and the state's new point of view]*. XXVII Congreso de la Asociación Latinoamericana de Sociología. Asociación Latinoamericana de Sociología, Buenos Aires. Retrieved from http://cdsa.aacademica.org/000-062/2277.pdf

Titiev, M. (1951). *Araucanian Culture in Transition*. Ann Arbor: University of Michigan Press.

Tokman, A. (2010) Radiografía de la educación parvularia chilena: desafíos y propuestas, Serie de Políticas Públicas UDP, [Radiography of the Chilean pre-primary education: challenges and proposals, Series of Public Policies UDP]. Working Paper, No. 5. Retrieved from http://expansiva.cl/media/publicaciones/wpapers/20100317112011.pdf

Valenzuela, J.M., Labarrera, P., & Rodriguez, P. (2008). Educacion en Chile: Entre la continuidad y las rupturas. Principales hitos de las polfticas educativas.[Education in Chile: Between continuity and ruptures. Landmarks of educational policies] *Revista Iberoamericana de Educacion, 48,* 129- 145. Retrieved from http://www.rieoei.org/rie48a06.htm

Whitehurst, G. J., & Lonigan, C. J. (1998). Child development and early literacy. *Child Development, 69*, 848–872

Williamson, G., Pérez, I., Modesto, F., Coilla, G., & Raín, N. (2012). Infancia y adolescencia Mapuche en relatos de la Araucanía [Mapuche infancy and adolescence in narrations of the Araucanía región]. *Contextos Educativos, 15*, 135–152.

Chapter 3

Preschoolers' Vocabulary Acquisition in Chile: The Roles of Socioeconomic Status and Quality of Home Environment

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Abstract

Preschoolers' vocabulary acquisition sets stage for later reading ability and school achievement. This study examined the role of socioeconomic status (SES) and the quality of the home environment of 77 Chilean majority and Mapuche minority families from low and lower-middle class backgrounds in explaining individual differences in vocabulary acquisition of their three-and-a half-year-old children. Additionally, we investigated whether the relation between SES and receptive and expressive vocabulary was mediated by the quality of the home environment as the Family Investment Model suggests. The quality of the home environment significantly predicted receptive and expressive vocabulary above and beyond ethnicity, SES, parental caregiver status, and quantity of daycare. Furthermore, the quality of the home environment mediated the relation between SES and receptive and expressive vocabulary acquisition.

Keywords: preschooler's vocabulary acquisition, quality of home environment, SES, ethnicity, Family Investment Model

Introduction

The Family Investment Model explains how higher socioeconomic status predicts higher levels of parental investment in child development, which in turn predicts more favorable child outcomes (Conger & Donellan, 2007), such as early language acquisition (e.g. Bus, Van IJzendoorn, & Pellegrini, 1995; Rodriguez & Tamis-LeMonda, 2011; Song, Spier, & Tamis-Lemonda, 2013). However, almost all research (96%) in the field of human behavior and development is based on samples from the so-called Western, educated, industrialized, rich, and democratic countries, which comprise a disturbingly small (12%) and unrepresentative portion of the world's population (Henrich, Heine, & Norenzayan, 2010). This is highly problematic, as socioeconomic and cultural context can affect both the manifestations and the interrelations of key developmental processes (Bornstein, 1995; Bornstein, Putnick, Lansford, Deater-Deckard, & Bradley, 2015). The Family Investment Model is of special relevance for less affluent parts of the world, where socioeconomic disadvantage is often the norm. However, it is unclear whether the same family processes hold up in populations characterized by generally lower socioeconomic conditions and different ethnic backgrounds with their own sets of social customs and cultural parenting practices. Hence it is important to study commonly-found relations between family processes and child development outside the Western world to establish whether these patterns of associations are shared cross-culturally as the universal effects assumption states or whether cultural differences occur (Norenzayan & Heine, 2005; Segall, Lonner, & Berry, 1998). In the current study, we test the Family Investment Model in the Latin-American cultural context of Chile, examining parental investment in terms of the quality of the home environment as a mediator in the relation between socioeconomic status and preschool children's vocabulary acquisition.

The Family Investment Model applied to Children's Vocabulary Acquisition

Differential cognitive child outcomes depending on family socioeconomic status can be partly explained by genetic factors, reflecting the intergenerational transmission of cognitive abilities (Bartels, Rietveld, Van Baal, & Boomsma, 2002; Dickens, 2005). However, there is also evidence that the socialization factors play an important role (Anger & Heineck, 2010). The Family Investment

Model is a mediating model explaining possible pathways between family SES and child developmental outcomes (Conger & Donellan, 2007). The quality of the home environment has shown to be an important mediator between the two. According to the Family Investment Model, families with greater wealth and financial prosperity invest more and more positively in the physical, emotional, and cognitive development of their children than disadvantaged families. There are only a few Western studies that have examined the full mediation model from SES to family investment to children's language acquisition (Yeung, Linver, & Brooks–Gunn, 2002) and almost none in Latin America. The so far only study conducted in Chile found that higher maternal education predicted more maternal cognitive and linguistic stimulation at home, which in turn predicted higher levels of children's receptive vocabulary (Coddington, Mistry, & Bailey, 2014). Each of the steps of this mediation model are addressed below.

Socioeconomic Status (SES) and Vocabulary Acquisition. Socioeconomic status is commonly conceptualized as the social class to which an individual belongs and is mostly estimated by income, education and occupation. An individual's life course is determined by social class in manifold ways from the moment of conception to the last breath (Brooks-Gunn, Duncan, & Maritato, 1997). There is convincing evidence, mostly from Western countries, that children's vocabulary acquisition is strongly influenced by family income (Huston et al., 2005) and parental education (Hoff, 2006). In Latin-America, higher parental education has been linked to higher vocabulary scores in Chilean and Mexican children (Richman, Miller, & LeVine, 1992; World Bank, 2012).

SES and Quality of the Home Environment. The physical, emotional and learning environment in which children are raised at home is related to their developmental outcomes. Research in Western samples clearly shows that lower-SES families provide less stimulating home environments (Bradley & Corwyn, 2002; Bradley, Corwyn, McAdoo, & Garcia Coll, 2001; Prevoo et al., 2014). Low-SES mothers invest less time in mutual play, conversation, and reading activities with their children than middle-SES mothers, partly because they have less material and non-material resources at their disposal and suffer from additional stress due to economic hardship (Bradley & Corwyn, 2002; Coley, 2002; Hoff-Ginsberg, 1991). A review reports that in Latin America

parents place less emphasis on stimulation and teaching of academic skills than in Western countries (Bradley & Corwyn, 2005). These cultural practices coupled with generally poorer living conditions in Latin America, which inter alia manifest in fewer available toys and learning materials in the children's homes, are both likely to negatively affect children's vocabulary acquisition.

Quality of the Home Environment and Vocabulary Acquisition. Research in North-America and Europe has revealed that children show improved vocabulary acquisition if they grow up in more linguistically and academically stimulating homes, with responsive parents and availability of a variety of age-appropriate learning materials (e.g. Bus, Van IJzendoorn, & Pellegrini, 1995; Rodriguez & Tamis-LeMonda, 2011; Song, Spier, & Tamis-Lemonda, 2013). In linguistically and cognitively stimulating homes children are encouraged to explore and to expand their knowledge (Caldwell & Bradley, 2003). They are exposed to more frequent and more diverse language and are invited to express themselves verbally. Responsive parents converse with their children, attend to their children's speech, praise their children, and may also express their appreciation non-verbally by for instance cuddling, holding and caressing their children. Stimulating homes are also characterized by the availability of learning materials such as books or toys, which may enhance children's cognitive and socio-emotional growth (Isenberg & Quisenberry, 2002).

The Chilean Context

The following four characteristics of the Chilean context are particularly relevant to the study of preschoolers' language acquisition: SES, ethnicity, single parenthood, and daycare attendance.

Socioeconomic status. UNICEF (Hudson & Kühner, 2016) concluded that Chile has the second highest child poverty rate of the developed world after analyzing 41 OECD (Organization for Economic Cooperation and Development) and European Union countries. Three out of 10 children live below the poverty line, which means that 1,200,000 Chilean children are affected. Moreover, the proportion of 15-year-olds falling below proficiency level 2 on the PISA tests (Program for International Student Assessment) in reading, math, and science is as high as 24,6% in Chile. This means that a quarter of the adolescent Chilean secondary school students do not understand

what they read, cannot solve basic mathematical operations like multiplication or division and cannot reason about everyday natural occurrences, because they are lacking basic skills and competencies. Acquisition of these skills and competencies starts early in life and language is known to be a fundamental precondition for all academic learning in kindergarten, primary and secondary school (Forget-Dubois, Dionne, Lemelin, Pérusse, Tremblay, & Boivin, 2009; Harlaar, Hayiou-Thomas, Dale, & Plomin, 2008; NICHD ECCRN, 2005). The apparent deficit of language learning impacts the lives of millions of Chileans not only across the school years, but all across adult life. Seventy-one percent of the Chilean adult population has no post-secondary schooling (CASEN, 2013), which considerably decreases job opportunities and income, thereby maintaining the cycle of poverty. Early language learning in Chile deserves special research attention, because of the far-reaching societal consequences and the short- and long-term dimension of related problems. The current study aims to examine whether variations in SES within a non-Western low-SES context are related to the quality of the home environment and preschool children's language acquisition.

Ethnicity. Chile is a multiethnic society, home to native Americans and descendants of European immigrants. According to single nucleotide polymorphism analysis, a method to map genetic variability, the average Chilean is genetically composed of 42% native American, 55% European, and 3% African ancestry (Eyheramendy, Martinez, Manevy, Vial, & Repetto, 2015). The indigenous Mapuche people constitute the largest minority group and comprise 9% of the national population (one and a half million people). In the Araucanía region, the stronghold of Mapuche culture, the largest regional Mapuche population (31.3%) and highest regional poverty rates (28%) of Chile coincide (CASEN, 2013; INE, 2012). In this particular region, poverty rates are also higher among the Mapuche minority group members compared to Chilean majority group members, which is partially due to lower educational levels, more minimum wage labor and more unemployment (Cerda, 2009). Nowadays, rural life on ancestral lands or assigned reductions belong to the past for the vast majority of the national Mapuche population (80%), who exchanged it for life in urban contexts and have hence adopted the dominant Chilean culture, language, religion, and life-style (work, housing, health and education), which makes them largely indistinguishable from majority group

members of the same social class (Caniguan, 2012). The ethnic language of the Mapuche is called Mapudungun and was traditionally a spoken language without written form. Mapudungun was spoken by the Mapuche people before the Law of Obligatory Primary Schooling was adopted in Chile in 1920 (Soto, 2009). This law made attendance to a Western Spanish-speaking school system mandatory for indigenous children and Mapuche children were punished for speaking their native tongue. Consequently, Spanish has gradually become the dominant language of the Mapuche people over the past century and Mapudungun is nowadays only spoken with high proficiency by 4% of Mapuche adolescents between 10 and 19 years in the south of Chile (Gundermann, Canihuan, Clavería, & Faúndez, 2009). Yet, the broader minority language environment of Mapuche children can still be less conducive to Spanish language acquisition. In the current study, we will take ethnicity into account when examining the predictors of children's vocabulary acquisition.

Single parenthood. Another relevant factor to the study of children's language acquisition in Chile is single parenthood. Twenty percent of all Chilean homes are one-parent households, meaning there is no spouse or partner present (CASEN, 2011). One-parent households concentrate in the lowest income groups, more than two thirds fall into the two lowest income categories, which implies that these families are socially vulnerable and are struggling with poverty. In this context it is important to note that children of single mothers in low-SES environments are at special risk of being linguistically under-stimulated, as their mothers are likely to spend even less time with their children due to higher levels of stress and less social support (Cairney, Boyle, Offord, & Racine, 2003). Heath (1990) has reported that children of single mothers who have little education and who live in public housing grow up in virtual silence due to lack of maternal speech. Thus, in the current study we will include single parenthood as a covariate in the main analyses.

Daycare attendance. Quantity of daycare attendance can also impact preschool children's vocabulary acquisition. For children of lower SES backgrounds, spending more time playing with peers and more involvement with professional caregivers in daycare centers may provide more fertile ground for language development than the immediate family can offer at home, which is in line with the compensatory hypothesis (Desai, Chase-Lansdale, & Michael, 1989).

In Chile, children spend increasingly more time in daycare, as a consequence of a fast-growing number of working mothers (INE bulletin, n.d.) and a considerable expansion of the national public daycare provision. Over the past two decades, nursery school provision quadrupled and kindergarten provision doubled (JUNJI, 2009). Some studies in Chile report beneficial short- and medium-term effects of daycare attendance on language outcomes (Cortázar, 2012; Noboa-Hidalgo & Urzua, 2012), but others report no improvements on vocabulary acquisition (Bucarey, Ugarte & Urzúa, 2014; Contreras & González, 2015). Such inconclusive results have also been found in Western countries where sometimes no relations between daycare attendance and child outcomes are reported (NICHD ECCRN, 2000), whereas others find that higher quantity of daycare relates to positive cognitive outcomes (e. g. Loeb, Bridges, Bassok, Fuller, & Rumberger, 2007; Luijk et al., 2015). In the current study, daycare attendance will be included as a covariate in the main analyses.

The Current Study

The aim of the current study is to test the Family Investment Model applied to language acquisition in the Latin-American cultural context of Chile, examining parental investment in terms of the quality of the home environment as a mediator in the relation between socioeconomic status and preschool children's vocabulary acquisition. We address the following research questions in a novel bi-ethnic population (Mapuche versus Chilean):

1.) What is the association between SES, the quality of the home environment and preschool children's receptive and expressive vocabulary acquisition in Chile?
2.) Is the association between SES and receptive and expressive vocabulary outcome mediated by the quality of the home environment?

We test the following hypotheses:

1.) Higher SES is associated with higher quality of the home environment. Higher SES and higher quality of the home environment in turn predict more favorable receptive and expressive vocabulary outcomes among preschool children in Chile.

2.) The association between SES and preschool children's receptive and expressive vocabulary outcome is mediated by the quality of the home environment.

The main analyses include previously described covariates known to relate to early child development namely ethnicity, parental caregiver status, and quantity of daycare attendance.

Method

Participants

The current study draws on an existing sample which was recruited at base line of the longitudinal Magellan-Leiden Childcare Study (Cárcamo, Vermeer, Van der Veer, & Van IJzendoorn, 2015), which started in February 2012 (Time 1) with 110 mothers of 6 months old infants born in 2011. The initial sample was drawn from three public health centers and records of 19 public daycare centers in the Araucanía region and on Chiloé Island (Lake region) in Chile. Nine months later at Time 2 when children were 15 months old the initial number of participants had decreased to 95 due to sample attrition. At Time 3 (January 2015), when the children were 42 months old, 16 additional mother-child dyads declined participation for various reasons (mostly due to lack of time). Two dyads of the remaining 79 dyads, who gave their written consent for the Time 3 measurement, were excluded due to missing outcome variables. This resulted in a current sample of 77 mother-child-dyads (81% of the Time 2 sample and 70% of initial sample). Participating dyads are from low to lower-middle class ethnic majority Chilean (n=45) and ethnic minority indigenous Mapuche (n=32) background. Mean household income per capita was 1.74 (SD = 1.14) on a 5 point scale according to national quintile distribution (for details about SES assessment see 'measures' subsection). Mothers' educational level (M = 2.17, SD = 0.83, on a 4 point scale) was distributed as follows: 18,2% either only completed primary school or did not complete secondary school, 55,8% completed secondary school, 16,9% completed vocational school, and 9,1% completed university studies. Mean age of mothers was 28.95 years and almost all primary caregivers were mothers, with the exception of one father. Forty-four percent of the children are raised by a single parent and 58% are boys. See Table 1 for descriptive statistics of childcare, vocabulary acquisition, and family characteristics.

Table 1
Descriptive statistics of childcare, vocabulary acquisition, and family characteristics (N=77)

		M	SD	Minimum	Maximum
Childcare and development variables					
HOME quality (average 6-42 mos.)		73.19	6.85	50.74	86.98
Quantity of daycare (6-42 mos.)		34.76	28.78	0.00	91.05
Receptive vocabulary		20.21	11.66	2.00	50.00
Expressive vocabulary		35.91	12.68	14.00	66.00
Family characteristics					
Maternal age (years)		28.95	7.71	17.00	47.00
Number of children		1.77	0.87	1.00	5.00
Child age (months)		41.89	1.25	39.49	44.90
		N	%		
Ethnicity	Mapuche	32	41.56		
	Chilean	45	58.44		
SES	Low	36	46.75		
	Lower-middle	41	53.25		
Child gender	Male	45	58.40		
	Female	32	41.60		
Caregiver status	One parent	34	44.20		
	Two parents	43	55.80		

Procedure

Ethical approval was obtained by the Ethical Committee Board of Leiden University (The Netherlands). Data of the present time point of our longitudinal study were collected by six trained female undergraduate psychology students of the Autónoma University Temuco, Chile. Participating dyads received three visits from December 2014 to February 2015 (Time 3), including a brief pre-visit of approximately 30 minutes and two home visits of approximately 90 minutes each. During the pre-visit the primary caregiver was informed about the subsequent data collection and invited to continue participating, after which the informed consent form was signed. During the Time 3 home visits the quality of the home environment was observed, children's receptive and expressive vocabulary was assessed, and mothers filled out a questionnaire about demographic data (education, employment, income), family and

household composition, the child's health and daycare attendance, and major life events. Tests were administered to all children according to a standardized sequential order and all testing was either audio or video recorded to be able to decide on scoring afterwards in case of ambiguous answers. The participants received a 10,000 CLP (US$ 16) voucher of a local supermarket or convenient store as remuneration for their collaboration.

Measures

Socioeconomic status. SES was computed as a composite of maternal education and per capita income level. The level of maternal education was self-reported at Time 3 on a 1-4 point scale (1=incomplete primary or secondary school; 2 = secondary school completed; 3= vocational education; 4= university studies). Four mothers did not report their educational level. In these cases the missing data was replaced with maternal educational level at Time 2 as best estimate. At Time 2, mothers were asked in a questionnaire to indicate their total gross monthly household income in Chilean Pesos (CLP) divided by the number of household members. This resulted in six per capita answer categories: no income (1), less than 61,911 Chilean Pesos (US$ 114) (2), between 61,912 and 105,907 CLP (US$ 195) (3), between 105,908 and 167,879 CLP (US$ 310) (4), between 167,880 and 300,869 CLP (US$ 556) (5) and more than 300,870 CLP (6). The socioeconomic categorization is based on the five quintiles of the Chilean Ministry of Social Development (MIDESO, n.d.). The first quintile reflects the most socioeconomically vulnerable members of society (20% of the national population), whereas the fifth quintile encompasses the most affluent Chileans. The maternal education and per capita income level were combined into one global indicator of SES by summing the standardized scores of both measures. We then dichotomized this variable due to limited variance of the income and education variables (82% of the sample had a monthly per capita income below US$ 200 and 75% of the mothers had no tertiary education). A median split was performed in order to group the participating families in low and lower-middle SES, resulting in two groups (low SES, N= 36; lower-middle SES, N = 41).

Quality of home environment. The Infant/Toddler Home Observation for Measurement of the Environment (IT-HOME; Caldwell & Bradley, 2003) was used at Time 1 and Time 2 when children were 6 and 15 months old

respectively (for details see Cárcamo et al., 2015). The Early Childhood Home Observation for Measurement of the Environment (EC-HOME; Caldwell & Bradley, 2003) was used to measure quality and quantity of stimulation and support available to a child in the home environment at Time 3. The IT-HOME and EC-HOME are both comprised of two parts: an observation of the home environment followed by a semi-structured interview with the primary caregiver of approximately 30 min each. In one case the primary caregiver was the child's father (single parent) and in one case the interview was conducted with the great aunt instead of the mother. The IT-Home consists of 45 items grouped in six subscales (responsivity, acceptance, organization, learning materials, involvement, variety) and the EC-Home consists of 55 items grouped in eight subscales (learning materials, language stimulation, physical environment, responsivity, academic stimulation, modelling, variety, and acceptance). The EC-HOME has been administered in many countries around the world including Chile and its validity for minority and low-SES groups has been well established (Bradley, Corwyn, McAdoo, & Garcia Coll, 2001; Bustos Correa, Herrera & Mathiesen, 2001; Cárcamo et al., 2015). The EC-HOME assessment was performed by the research assistants after an extensive training period (studying the manual, discussing items, video-scoring, and a pilot home visit). Observers achieved an average of 94 % agreement with expert scoring when interrater reliability was assessed. Internal consistency of the instrument was high, with a Cronbach's alpha of .81. An accumulated HOME score was computed indicating the overall quality of the home environment across all three time points by calculating mean percentage scores across the three measurements. All three HOME measurements were significantly correlated with each other; Pearson correlations ranged from .26 to .40.

Receptive vocabulary. The Spanish adaptation of the Peabody Picture Vocabulary Test (PPVT) was used (TVIP – Test de Vocabulario en Imágenes Peabody) to assess children's receptive vocabulary, because all participating children speak Spanish as their first language (Dunn, Padilla, Lugo, & Dunn, 1986). During test administration the child is shown one of the 125 black and white test plates at a time and after the research assistant names one of the four objects on the test plate the child has to point to the correct picture. Just as the PPVT, the TVIP has proven to be a reliable and valid instrument for receptive vocabulary assessment over the years (ACYF, 2003; Piñeiro et al., 2000). In the

current study the split-half (odd/even) sample reliability was > .95. There was one missing score due to the child's refusal to do the test and one child did not entirely finish the TVIP due to experimenter error. Each child's missing score was estimated based on the particular child's percentile score on the Expressive One Word Picture Vocabulary Test (EOWPVT-4).

Expressive vocabulary. The Expressive One Word Picture Vocabulary Test – Spanish Bilingual Edition (EOWPVT-4-SBE) measures children's ability to generate words (Nancy, 2013). The child is shown one of the 180 color pictures at a time and after a prompting question by the research assistant has to generate the word that best describes the object, concept, or action. A Cronbach's alpha of .95 indicates high internal consistency of the EOWPVT-4-SBE for Hispanic children aged three and four in the US (Nancy, 2013). In the current study the split-half (odd/even) sample reliability was >.94. One very low early suspension score (child was unmotivated) was replaced by an estimate based on the same child's percentile score on the TVIP.

Background variables.

Ethnicity. The ethnicity of the participating mother-child-dyads was determined by self-report (Cárcamo et al., 2015). Dyads were defined as Mapuche, when mothers stated that their children grow up in a Mapuche family.

Parental caregiver status. The caregiver status of the participating parents was determined by self-report. Children were defined as growing up in one-parent families, when it was reported that the father (or in one case mother) was not living in the same household as the child.

Quanity of daycare attendance. Directors of the daycare centers in the Araucanía region and on Chiloé Island and collaborating JUNJI (National Council of Daycare Centers) and INTEGRA (National Network of Nursery Schools and Kindergartens) staff were contacted in order to obtain the children's daycare attendance of the previous three years (2012-2014). They were asked to report how many days per monthly working days the participating children attended daycare. These numbers were transformed into a total percentage of each child's daycare attendance between 6 and 42 months. Of two children the daycare centers could not provide the information of the year 2012. In these cases the child's daycare attendance was estimated based on the child's daycare attendance percentile scores of the year 2013.

Analysis Plan

Language measures, HOME global quality, daycare attendance, maternal age, maternal education, and per capita income were inspected for outliers defined as values with SD greater than 3.29 above the mean (Tabachnick & Fidell, 1996). No outliers were found. All variables were normally distributed with the exception of quantity of daycare, which can be expected as not all children attended daycare. Pearson correlation coefficients were computed to inspect the bivariate associations between all variables.

As primary analyses hierarchical multiple regression analyses (HMR) was conducted to test whether receptive and expressive child vocabulary at 3½ years varied as a function of SES and the quality of home environment, controlling for ethnicity, parental caregiver status, and quantity of daycare. The models included the following variables: SES (0 = low; 1 = lower-middle), home quality (percentage across Time 1, Time 2, and Time 3) ethnicity (0 = Chilean majority; 1 = Mapuche minority), parental caregiver status (0 = one-parent, 1 = two-parents), and quantity of daycare (percentage of total daycare attendance from 6-42 months).

Mediation analyses were performed to examine whether SES had an indirect effect on receptive and expressive vocabulary through quality of the home environment. The Preacher and Hayes method to test mediation was applied using the macro package for SPSS available online which allows for multiple mediators. This test is not based on large-sample theory, meaning it can be applied to small samples with more confidence. This method adopts the bootstrapping approach which, unlike the Sobel test, respects the non-normality of the sampling distribution of the indirect effect (Preacher & Hayes, 2008). This approach bootstraps the sampling distribution of the indirect effect and derives a confidence interval with the empirically derived bootstrapped sampling distribution (Preacher & Hayes, 2004). The bootstrapping is accomplished by taking a large number of samples of the original sample from the data and computing the indirect effect in each sample, which is also called sampling with replacement. Five thousand bootstrap resamples were generated and the significance of the indirect effect was tested using bias-corrected bootstrap 95% confidence intervals.

Results

Sample Inspection

We compared the remaining sample to the dropouts. An independent t-test indicated that the drop-outs ($n = 33$, $M = 23.21$; $SD = 5.67$) were significantly different from the current participants ($n = 77$; $M = 26.30$; $SD = 7.67$) in terms of maternal age with relatively more younger mothers among the drop-outs than among the remaining mothers, $t(108) = 2.08$, $p < .05$. This was partly due to the tendency of teenage mothers to be unavailable for participation at Time 3. A Chi-square test revealed another significant difference between the drop-outs and current participants on SES [$\chi^2(1, N = 110) = 28.01$, $p < .01$]. All of the 33 families that discontinued participating in this study were from low-SES backgrounds .No differences emerged between the drop-outs and the current sample on child gender [$\chi^2(1, N = 110) = 0.14$, $p = .71$], ethnicity [$\chi^2(1, N = 110) = 1.24$, $p = .27$] and marital status [$\chi^2(1, N = 110) = 0.26$, $p = .61$].

We further compared our sample to the large scale nationally representative sample of the Longitudinal Survey of Early Childhood (ELPI –Encuesta Longitudinal de la Primera Infancia) on overlapping measures (Cárcamo et al., 2015). We found that the mean per capita income in our sample is below the mean national per capita income per month. Also, participating mothers had less education. This is consistent with our characterization of the current sample as 'low-SES'. The HOME results of our study ($M = 73.13\%$, $SD = 6.85$) were in the typical range compared to low-SES participants of the ELPI sample ($M = 72.47\%$, $SD = 4.44$). The TVIP results of our study ($M = 20.21$ $SD = 11.66$) were also in the typical range compared to low-SES participants of the ELPI sample ($M = 17.04$, $SD = 12.69$).

Bivariate Associations between Predictors and Outcomes

Pearson correlations were calculated for all variables (see Table 2). Receptive and expressive vocabulary were significantly associated ($r(75) = .61$, $p < .01$). Home quality significantly correlated with receptive ($r(75) = .28$, $p < .05$) and expressive vocabulary ($r(75) = .30$, $p < .01$) and with SES ($r(75) = .29$, $p < .01$). SES was furthermore significantly positively associated with expressive vocabulary ($r(75) = .23$, $p < .05$). All other correlations were non-significant.

Table 2
Correlations between receptive and expressive vocabulary, quality of home environment, quantity of daycare attendance, and family characteristics (N=77)

		1	2	3	4	5	6	7
1	Receptive vocabulary	–						
2	Expressive vocabulary	.61**	–					
3	HOME quality (percentage T1-T3)	.28*	.30**	–				
4	Ethnicity [a]	-.17	-.20	.00	–			
5	Socioeconomic status	.14	.23*	.29**	-.11	–		
6	Parental caregiver status [b]	-.14	-.03	-.09	-.11	.01	–	
7	Quantity of daycare (6-42 m)	-.05	-.03	.05	.04	.11	-.17	–

[a] 0 = Chilean majority, 1 = Mapuche minority; [b] 0 = one parent, 1 = two parents
* $p < 0.05$, ** $p<0.01$

Predicting Vocabulary Acquisition

Two three stage hierarchical multiple regression analyses were conducted with receptive and expressive vocabulary as outcome variables respectively. Ethnicity, parental caregiver status, and quantity of daycare attendance were entered at stage one of the regression to control for demographic background variables. SES was entered at stage two and the quality of the home environment at stage three. The variables were entered in this order according to the Family Investment Model. At stage one the demographic background variables neither significantly predicted receptive vocabulary [$F(3,73) = 1.57$, $p = .20$], nor expressive vocabulary [$F(3,73) = 1.13$, $p = .34$]. At stage two SES did not contribute significantly to the prediction of receptive vocabulary [$F(4,72) = 1.54$, $p = .20$] or expressive vocabulary [$F(4,72) = 1.79$, $p = .06$]. Including quality of the home environment to the model at stage three explained an additional 6% of the variance in receptive and expressive vocabulary. The quality of home environment was a marginally significant predictor of receptive vocabulary [$F(5,71) = 2.25$, $p = .06$] and a significant predictor of expressive vocabulary [$F(5,71) = 2.55$, $p < .05$], above and beyond SES and the demographic variables. Together the five predictors accounted for 14% of the variance in receptive vocabulary and for 15% of the variance in expressive vocabulary. Table 3 shows the results of the hierarchical multiple regression analyses.

Testing the Mediation Models

Next, we tested whether the quality of the home environment fully or partially mediated the relation between SES and receptive and expressive vocabulary acquisition respectively. As Figure 1a and 1b illustrate, the standardized regression coefficient between SES and quality of home environment was significant, as was the standardized regression coefficient between quality of home environment and both receptive and expressive vocabulary acquisition. A simple association between SES and vocabulary acquisition is not required in order to test mediation hypotheses (Hayes, 2009). We examined the significance of this indirect effect (the indirect effect of *X* on *Y* is defined as the product of the *X* →*M* path and the *M*→*Y* path) using the previously described bootstrapping procedures by Preacher and Hayes (2004 & 2008). We found that the direct relation between SES and both receptive and expressive vocabulary diminished when the quality of the home environment was included in the model, indicating partial mediation. The first mediation analysis (see Figure 1a) revealed that the indirect effect from SES to receptive vocabulary through quality of home environment was significant [β = .08, *SE* = 0.05, 95% CI, BCaCI (0.01, 0.21)]. The bootstrapped standardized indirect effect was .08, and the 95% Bias Corrected and Accelerated Confidence Interval ranged from 0.01 to 0.21. The lower and upper limit of the Confidence Interval did not pass through zero, which means that the indirect effect is statistically significant. The mediator thus accounted for roughly half of the total effect of SES on receptive vocabulary acquisition. The second mediation analysis (see Figure 1b) demonstrated that the indirect effect from SES to expressive vocabulary through quality of home environment was significant as well [β = .08, *SE* = 0.04, *95%* CI, BCaCI (0.01, 0.18)], and accounted for roughly one third of the total effect between SES and expressive vocabulary acquisition.

Table 3
Hierarchical regression analyses predicting receptive and expressive vocabulary from quality of home environment (N=77)

	Model 1			Model 2		
	Receptive vocabulary [a]			Expressive vocabulary [b]		
	$R^2 = .06$	$R^2 = .08$	$R^2 = .14$	$R^2 = .04$	$R^2 = .09$	$R^2 = .15$
	$p = .20$	$p = .20$	$p = .06$	$p = .34$	$p = .14$	$p = .04$
Predictors	β	β	β	β	β	β
Ethnicity	-.19	-.18	-.18	-.21	-.18	-.19
Parental caregiver status	-.17	-.17	-.15	-.05	-.06	-.03
Quantity of daycare 6-42 months	-.08	-.09	-.09	-.03	-.06	-.06
Socioeconomic status		.14	.06		.22	.14
Home quality (percentage T1-T3)			.25*			.26*

[a] Test de Vocabulario en Imágenes = Spanish version of Peabody Picture Vocabulary Test (Dunn, L.M., Padilla, E.R., Lugo, D.E., Dunn, L.M., 1986);
[b] Expressive One-Word Picture Vocabulary Test – four – Spanish Bilingual Edition (Nancy, M., 2013).
* p < .05, ** p< .01

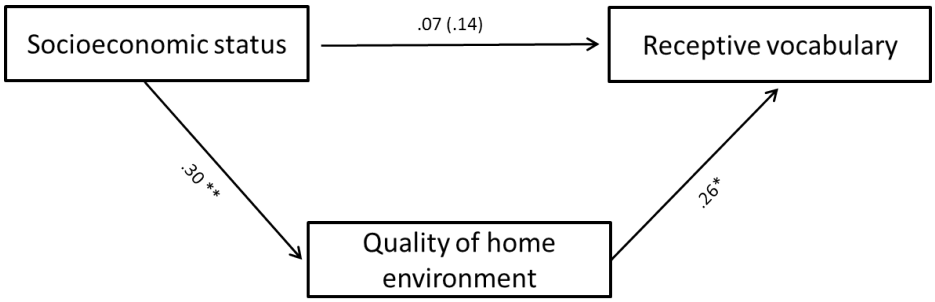

Figure 1a. The mediating role of quality of home environment in the relation between socioeconomic status and receptive vocabulary (N = 77). Numbers represent standardized coefficients (β). The coefficient prior to the parentheses depicts the association between SES and receptive vocabulary, controlling for quality of home environment, whereas the coefficient within the parentheses reflects the total effect (direct effect + indirect effect) without controlling for the mediator. $^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$.

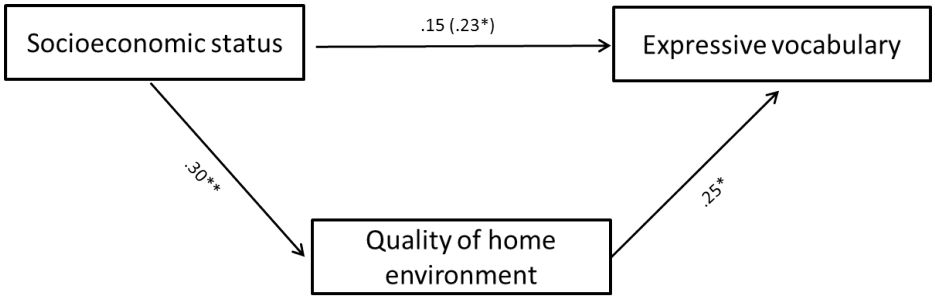

Figure 1b. The mediating role of quality of home environment in the relation between socioeconomic status and expressive vocabulary (N = 77). Numbers represent standardized coefficients (β). The coefficient within the parentheses reflects the total effect (direct effect + indirect effect) without controlling for the mediator and the coefficient prior to the parentheses depicts the association between SES and expressive vocabulary, controlling for quality of home environment. $^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$.

Discussion

Our findings advance the understanding of how SES and the quality of the home environment relate to preschool children's vocabulary acquisition in a non-Western context. We investigated the associations between receptive and expressive vocabulary, quality of home environment, SES, ethnicity, parental caregiver status, and quantity of daycare. We found associations between the quality of the home environment, SES, and vocabulary acquisition. On the contrary, ethnicity, parental caregiver status, and quantity of daycare did not explain variations in vocabulary acquisition. As expected, participating preschool children in Chile with higher-quality home environments showed higher receptive and expressive vocabulary scores. The effect of the quality of home environment on vocabulary development remained above and beyond the effects of ethnicity, SES, parental caregiver status, and quantity of daycare attendance. Previous research has shown a positive relation between quality of home environment and language outcomes for children in Western countries (Bus et al., 1995; Rodriguez & Tamis-LeMonda, 2011). We are the first to find similar results in a bi-ethnic low-SES sample in a novel Latin American context, consisting of indigenous Mapuche minority and Chilean majority families in Chile. Our findings support the universal effects assumption that entails cross-cultural similarities in developmental processes despite mean level differences and suggests that the quality of home environment matters for children's vocabulary acquisition in Chile, as it does for children in Western countries.

We also investigated whether quality of the home environment mediated the relation between SES and receptive and expressive vocabulary. As expected we found that the association between SES and both receptive and expressive vocabulary was partially mediated by quality of the home environment. Low-SES mothers in our sample provided less enriching home environments to their children (e.g. less cognitive and linguistic stimulation, less learning materials), which resulted in lower vocabulary outcomes. Our findings thus support the Family Investment Model (Conger & Donnellan, 2007), which highlights the importance of financial, educational, and occupational resources and parental investments in their children as pathways for child development. According to our results SES indirectly affects children's language learning outcomes through the provision of an adequate language learning environment at home. The mediating role of the quality of the home environment in relation between SES

and vocabulary acquisition is in line with prior research conducted in Chile (Coddington et al., 2014). If replicated, the home environment can open up crucial avenues for intervention by offering more linguistic opportunities for low-SES children.

The included covariates ethnicity, parental caregiver status, and daycare attendance did not predict receptive or expressive vocabulary. Mapuche minority children and Chilean majority children did not differ in their receptive and expressive vocabulary. The absence of these differences seems consistent with prior findings indicating that the majority of the Mapuche are largely indistinguishable from their Chilean compatriots due to adaptation to the dominant culture and urbanized life style (Caniguan, 2012). In our sample, one-parent caregiving was not significantly negatively associated with children's vocabulary acquisition as the literature – mostly based on Western samples - suggests. This could be explained by the fact that contrary to the situation in Western countries, single mothers in Chile rarely live on their own. Multigenerational households are very common especially among low-SES groups in which immediate and/or extended family members live collectively under one roof. These circumstances may naturally compensate for the absence of nonresident fathers in terms of linguistic stimulation. Likewise quantity of daycare attendance between 6 and 42 months did not contribute to preschool children's vocabulary acquisition. The large scale and nationally representative sample of the ELPI study in Chile did not find significant associations either between daycare attendance and receptive language performance (Contreras & González, 2015). Possibly, the quality of daycare may be more important than the quantity of daycare when it comes to explaining individual differences in vocabulary acquisition of low-SES children, as has been shown in several international large-scale studies (Love et al., 2003; NICHD ECCRN, 2002).

Strong points of the study include the so far understudied Latin-American cultural context of both indigenous Mapuche ethnic minority families and ethnic majority families in Chile, in combination with the longitudinal design, the use of observational and performance measures and the inclusion of both receptive and expressive language outcomes. There are also some limitations. First, the indigenous sample might not be representative of the general Mapuche population in Chile that also includes more isolated communities of Mapuche in remote rural areas who are still more affiliated with their traditions and native language. Second, thirty percent of the original sample, which was

recruited at the initiation of the longitudinal study in 2012, was lost and drop-out mothers were from the lowest SES level. Finally, quality of the daycare environment was not included in this study, which limits our understanding of how daycare programs impact children's linguistic development.

In agreement with the Family Investment Model, our findings underline the crucial role of family processes in predicting individual differences in preschool children's vocabulary acquisition (Conger & Donnellan, 2007). The fact that these results were obtained by testing the full mediation model in a non-Western bi- ethnic sample suggests that these family processes might be universal. Theories do need to be mindful of culture-specific processes, however, such as the wider social networks that play a larger role in non-Western communities than in Western countries, and thus might mitigate the effects of risk factors such as single parenthood. Further, the current study provides evidence that theoretical models of the negative influence of socioeconomic adversity also apply to variations *within* low-SES populations, suggesting that even marginal increments in SES can benefit family functioning and child language acquisition. In as much as family SES is difficult to modify, our study points to family processes as an important pathway for interventions directed at the improvement of linguistic development in low-SES children. Indeed, a review of home interventions in developing countries revealed that improving young children's cognitive stimulation and learning opportunities has a significant impact on their cognitive functioning (Walker et al., 2007). Such interventions do need to be analyzed carefully, however, to uncover potential cultural factors that need to be taken into account. In conclusion, the current study confirms existing theoretical frameworks regarding family processes and child development, and builds on empirical work pointing towards parents as crucial agents in attempts to improve child language acquisition not only in Western countries, but also in the cultural context of Latin America. Undoubtedly more research is needed in non-Western populations to further explore universality of the mechanisms behind vocabulary acquisition, particularly in at risk populations.

References

ACYF - Administration for Children, Youth & Families. (2003). *Head Start FACES (2000): A whole child perspective on program performance fourth progress report*. Washington, DC: Author. Retrieved from http://files.eric.ed.gov/fulltext/ED478791.pdf

Anger, S., & Heineck, G. (2010). Do smart parents raise smart children? The intergenerational transmission of cognitive abilities. *Journal of Population Economics*, *23*, 1105–1132.

Bartels, M., Rietveld, M. J., Van Baal, G. C. M., & Boomsma, D. I. (2002). Genetic and environmental influences on the development of intelligence. *Behavior Genetics*, *32*, 237–249.

Bornstein, M. H. (1995). Form and function: Implications for studies of culture and human development. *Culture & Psychology, 1*, 123–137.

Bornstein, M. H., Putnick, D. L., Lansford, J. E., Deater-Deckard, K., & Bradley, R. H. (2015). A developmental analysis of caregiving modalities across infancy in 38 low-and middle-income countries. *Child Development, 86*, 1571–1587.

Bradley, R. H., & Corwyn, R. F. (2002). Socioeconomic status and child development. *Annual Review of Psychology, 53*, 371–399.

Bradley, R. H., & Corwyn, R. F. (2005). Caring for children around the world: A view from HOME. *International Journal of Behavioral Development, 29,* 468–478.

Bradley, R. H., Corwyn, R. F., McAdoo, H. P., & Garcia Coll, C. (2001). The home environments of children in the United States part I: Variations by age, ethnicity, and poverty status. *Child Development, 72*, 1844–1867.

Brooks-Gunn, J., Duncan, G. J., & Maritato, N. (1997). Poor families, poor outcomes: The well-being of children and youth. In G. J. Duncan & J. Brooks-Gunn (Eds.), *Consequences of growing up poor*, 1-17. New York: Russel Sage Foundation.

Bucarey, A., Ugarte, G., & Urzúa, S. (2014). *El efecto de la educación preescolar en chile*. [The effect of preschool education in Chile]. Technical report. Retrieved from http://clientes.hugoo.com/temp/99/banco/Impacto_Educ_Parvularia_SIMCE_marzo2014.pdf

Bus, A. G., Van IJzendoorn, M. H., & Pellegrini, A. D. (1995). Joint book reading makes for success in learning to read: A meta-analysis on intergenerational transmission of literacy. *Review of Educational Research, 65,* 1–21.

Bustos Correa, C., Herrera, M. O., & Mathiesen, M. E. (2001). Calidad del ambiente del hogar: Inventario HOME como un instrumento de medición [Quality of the home environment: The HOME inventory as a measurement instrument]. *Estudios Pedagógicos, 27*, 7–22.

Cairney, J., Boyle, M., Offord, D. R., & Racine, Y. (2003). Stress, social support and depression in single and married mothers. *Social Psychiatry and Psychiatric Epidemiology*, *38*, 442–449.

Caldwell, B. M., & Bradley, R. H. (2003). *Home observation for measurement of the environment: Administration manual.* Little Rock, AR: University of Arkansas.

Caniguan, N. (2012). Infancia mapuche y migración en el Budi [Mapuche infancy and migration in the Budi]. *Revista Iberoamericana sobre Niñez y Juventud en Lucha por sus Derechos, 4*, 135–141.

Cárcamo, R. A., Vermeer, H. J., Van der Veer, R., Van IJzendoorn, M. H. (2015). Childcare in Mapuche and non-Mapuche families in Chile: the importance of socioeconomic inequality. *Journal of Child and Family Studies, 24*, 2668–2679.

CASEN - Ministry of Social Development. (2011). Survey of national socioeconomic characterization. Retrieved from http://observatorio.ministeriodesarrollosocial.gob.cl/casen/basededatos_historico.php

CASEN - Ministry of Social Development. (2013). The Situation of poverty in Chile. Retrieved from http://observatorio.ministeriodesarrollosocial.gob.cl/documentos/Casen2013_Situacion_Pobreza_Chile.pdf

Cerda, R. (2009). Situación socioeconómica reciente de los mapuches en la región de La Araucanía. [Recent socioeconomic situation of the Mapuche in the Araucanía region]. *Estudios Públicos, 113*, 27–108.

Coddington, C. H., Mistry, R. S., & Bailey, A. L. (2014). Socioeconomic status and receptive vocabulary development: replication of the parental investment model with Chilean preschoolers and their families. *Early Childhood Research Quarterly, 29*, 538–549.

Coley, R. J. (2002). *An uneven start: Indicators of inequality in school readiness. Policy information report.* Princeton, NJ: Educational Testing Service. Retrieved from http://www.ets.org/research/policy_research_reports/publications/report/2002/cikm

Conger, R. D. & Donnellan, M. B. (2007). An interactionist perspective on the socioeconomic context of human development. *Annual Review of Psychology, 58*, 175–99.

Contreras, D. & González, S. (2015). Determinants of early child development in Chile: health, cognitive development and demographic factors. *International Journal of Educational Development, 40*, 217–230.

Cortázar, A. (2012). *Long-term effects of early childhood education on academic achievement in Chile* (Doctoral dissertation). Teachers College, Columbia University. Retrieved from ProQuest Dissertations and Theses database. (UMI No. 3492908)

Desai, S., Chase-Lansdale, P. L., & Michael, R. T. (1989). Mother or market? Effects of maternal employment on the intellectual ability of 4-year-old children. *Demography, 26,* 545–561. Retrieved from http://www.jstor.org/stable/2061257

Dickens, W. T. (2005). Genetic differences and school readiness. *The Future of Children*, 55–69.

Dunn, L. M., Padilla, E. R., Lugo, D. E., Dunn, L. M. (1986). *Manual del examinador para el Test de Vocabulario en Imágenes Peabody*. [The experimenter's manual of the Peabody Picture Vocabulary Test]. Minneapolis, MN: Pearson Assessment.

Eyheramendy, S., Martinez, F. I., Manevy, F., Vial, C., & Repetto, G. M. (2015). Genetic structure characterization of Chileans reflects historical immigration patterns. *Nature Communications, 6*, 1–10.

Forget-Dubois, N., Dionne, G., Lemelin, J. P., Pérusse, D., Tremblay, R.E., & Boivin, M. (2009). Early Child Language Mediates the Relation Between Home Environment and School Readiness. *Child Development, 80,* 736–749.

Gundermann, H., Canihuan, J., Clavería, A., & Faúndez, C. (2009). Permanencia y desplazamiento, hipótesis acerca de la vitalidad del mapuzugun. [Permanence and displacement hypothesis about the vitality of Mapuzungun]. *RLA. Revista de Lingüística Teórica y Aplicada, 47*, 37–60.

Harlaar, N., Hayiou-Thomas, M. E. , Dale, P. S., & Plomin, R. (2008). Why Do Preschool Language Abilities Correlate With Later Reading? A Twin Study. *Journal of Speech Language, and Hearing Research, 51*, 688–705.

Hayes, A. F.(2009). Beyond Baron and Kenny: Statistical mediation analysis in the new millennium. *Communication Monographs, 76*, 408–420.

Heath, S. B. (1990). The children of Trackton's children: Spoken and written language in social change. Cambridge: Cambridge University Press.

Henrich, J., Heine, S. J., & Norenzayan, A. (2010). The weirdest people in the world? *Behavioral and Brain Sciences, 33,* 61–135.

Hoff, E. (2006). How social contexts support and shape language development. *Developmental Review, 26*, 55–88.

Hoff-Ginsberg, E. (1991). Mother-child conversation in different social classes and communicative settings. *Child Development, 62*, 782–796.

Hudson, J. & Kühner, S. (2016). Fairness for Children. A league table of inequality in child well-being in rich countries (Unicef Innocenti Report Card 13), Florence: Unicef Innocenti Research Centre. Retrieved from: https://www.unicefirc.org/publications/pdf/RC13_eng.pdf

Huston A. C., Duncan G. J., McLoyd V. C., Crosby, D. A., Ripke, M. N., Weisner, T.S., Eldred, C.A. (2005). Impacts on children of a policy to promote employment and reduce poverty for low-income parents: New Hope after 5 years. *Developmental Psychology, 41*, 902–18

INE bulletin, (n.d.) Retrieved from http://www.ine.cl/boletines/detalle.php?id=2&lang=http://www.ine.cl/canales/menu/boletines/ipv/2006/2006/feb/280206/88_empleoysectores.pdf & http://www.ine.cl/filenews/files/2011/febrero/pdf/nov_ene-empleo148.pdf

INE - Instituto Nacional de Estadísticas (2012). *Resultados XVIII Censo de Población* [Results XVIII of the population census]. Santiago de Chile. Government of Chile. Retrieved from https://www.cooperativa.cl/noticias/site/artic/20130425/asocfile/20130425190105/resultados_censo_2012_poblacion_vivienda_tomosiyii.pdf

Isenberg, J. P. & Quisenberry, N. (2002). A position paper of the Association for Childhood Education International PLAY: Essential for all Children. *Childhood Education*,*79*, 33–39.

JUNJI National Council of Daycare Centers, (2009). *Balance de gestión integral, año 2009*. [Annual balance of integral management]. Retrieved from http://www.dipres.cl/574/articles-60662_doc_pdf.pdf

Loeb, S., Bridges, M., Bassok, D., Fuller, B., & Rumberger, R. W. (2007). How much is too much? The influence of preschool centers on children's social and cognitive development. *Economics of Education Review, 26*, 52–66.

Love, J. M., Harrison, L., Sagi-Schwartz, A., Van IJzendoorn, M. H., Ross, C., Ungerer, J. A., Raikes, H., Brady-Smith, C., Boller, K., Brooks-Gunn, J., Constantine, J., Kisker, E., Paulsell, D., &Chazan-Cohen, R. (2003). Child care quality matters: How conclusions may vary with context. *Child Development, 74*, 1021–1033.

Luijk, M. P. C. M., Linting, M., Henrichs, J., Herba, C. M., Verhage, M. L., Schenk, J. J., ... & IJzendoorn, M. H. (2015). Hours in non-parental childcare are related to language development in a longitudinal cohort study. *Child: Care, Health and Development, 41*, 1188–1198.

MIDESO – Ministerio de Desarrollo Social [Ministry of Social Development, Chile] (n.d.). Nivel socioeconómico [socioeconomic level]. Retrieved June 4, 2015, from http://www.contablesytributarias.com/2014/05/ingresos-por-quintiles-ano-2014.html

Nancy, M. (2013). *Expressive One-Word Picture Vocabulary Test – four – Spanish Bilingual Edition (EOWPVT-4-SBE)*. Novato, CA: Academic Therapy Publications.

NICHD Early Child Care Research Network. (2000). The relation of childcare to cognitive and language development. *Child Development, 71*, 960–980.

NICHD Early Child Care Research Network. (2002). Early childcare and children's development prior to school entry: Results from the NICHD Study of Early Childcare. *American Educational Research Journal, 39,* 133–164.

NICHD Early Child Care Research Network. (2005). Pathways to reading: The role of oral language in the transition to reading. *Developmental Psychology, 41,* 428–442.

Noboa-Hidalgo, G. E. & Urzua, S. S. (2012). The effects of participation in public child care centers: Evidence from Chile. *Journal of Human Capital, 6*, 1–34.

Norenzayan, A., & Heine, S. J. (2005). Psychological universals: What are they and how can we know? *Psychological Bulletin*, *131*, 763–784.

Piñeiro, A., Manzano, M., Inguanzo, G., Reigosa, V. Morales A., & Fernández, C. (2000). Adaptación y normación de la prueba de vocabulario Peabody en una muestra de sujetos cubanos. [Adaptation and normation of the Peabody Picture Vocabulary Test in a sample of Cuban subject]. *Revista Cubana de Psicología, 17,* 147–153.

Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, & Computers*, *36*, 717–731.

Preacher, K. J. & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods, 40*, 879–891.

Prevoo, M, J. L., Malda, M., Mesman, J. Emmen, R. A. G., Yeniad, N., Van IJzendoorn, M. H., & Linting, M. (2014). Predicting ethnic minority children's vocabulary from socioeconomic status, maternal language and home reading input: different pathways for host and ethnic language. *Journal of Child Language, 41*, 963–984.

Richman, A. L., Miller, P. M., & LeVine, R. A. (1992). Cultural and educational variations in maternal responsiveness. *Developmental Psychology, 28,* 614–621.

Rodriguez, E. T. & Tamis-LeMonda, C. S. (2011). Trajectories of the home learning environment across the first 5 years: Associations with children's vocabulary and literacy skills at prekindergarten. *Child Development, 82*, 1058–1075.

Segall, M. H., Lonner, W. J., & Berry, J. W. (1998). Cross-cultural psychology as a scholarly discipline: On the flowering of culture in behavioral research. *American Psychologist*, *53*, 1101–1110.

Song, L., Spier, E. T., & Tamis-Lemonda, C. S. (2013). Reciprocal influences between maternal language and children's language and cognitive development in low-income families. *Journal of Child Language, 40*, 1–22.

Soto, E. (2009). La escolarización de los mapuche de Chile y la nueva mirada del estado. [Schooling of the Mapuche in Chile and the new perspective of the state]. *XXVII Congreso de la Asociación Latinoamericana de Sociología*. Asociación Latinoamericana de Sociología, Buenos Aires. Retrieved from http://cdsa.aacademica.org/000-062/2277

Tabachnick, B. G., & Fidell, L. S. (1996). *Using multivariate statistics (3rd ed.)*. New York: Harper Collins.

Walker, S. P., Wachs, T. D., Gardner, J. M., Lozoff, B., Wasserman, G. A., Pollitt, E., ... & International Child Development Steering Group. (2007). Child development: risk factors for adverse outcomes in developing countries. *The Lancet*, *369*, 145–157.

World Bank, Poverty Reduction and Economic Management Unit, Latin American and Caribbean Region (2012). *Monitoring basic opportunities throughout the lifecycle with the human opportunity index in Chile.* (Report No.: 67654-CL). Retrieved from https://openknowledge.worldbank.org/ handle/ 10986/11919

Yeung, W. J., Linver, M. R., & Brooks–Gunn, J. (2002). How money matters for young children's development: Parental investment and family processes. *Child Development*, *73*, 1861–1879.

Chapter 4

Socioeconomic Status, Parental Beliefs, and Parenting Practices as Predictors of Preschoolers' School Readiness and Executive Functions in Chile

Lohndorf, R. T., Vermeer, H. J., De La Harpe, C., and Mesman, J.

Abstract

Parental beliefs and parenting practices in early childhood are fundamental for the development of preschooler's school readiness and executive functions. This study examined the role of socioeconomic status (SES), ethnicity, maternal self-efficacy, parental cognitive stimulation, and maternal supportive discipline as predictors of five-year-old preschoolers' school readiness and executive functions abilities in 70 low-SES families from Chilean majority or indigenous Mapuche minority background in Chile. Additionally, we investigated the mediating role of parental beliefs and parenting practices between SES and school readiness or executive functioning respectively as the Family Stress Model suggests. Maternal supportive discipline predicted school readiness above and beyond SES and ethnicity. Furthermore, maternal supportive discipline mediated the relation between SES and school readiness, whereby higher SES positively affected maternal supportive discipline, which in turn affected school readiness favorably. All other associations were non-significant.

Keywords: parental beliefs and parenting practices, school readiness, executive functions, preschoolers, Family Stress Model

Introduction

The first years of life mark a critical period in children's cognitive development. Parenting processes such as parental beliefs, sensitivity, discipline, and cognitive stimulation play a key role in preschool children's acquisition of executive functions, early math, and early literacy abilities (Chazan-Cohen et al., 2009; Pelletier & Brent, 2002). These school readiness abilities are fundamental preconditions for learning in school and later academic and occupational success (Melhuish, Phan, Sylva, Sammons, Siraj-Blatchford, Taggart, 2008; Sarsour et. al 2011). Children's cognitive development, however, may also depend on contextual factors, such as family socioeconomic status (SES) and culture (Bronfenbrenner, 2005). Economic difficulties have frequently been linked to reduced parenting quality (Bradley & Corwyn, 2002; Conger & Donnellan, 2007; Linver, Brooks-Gunn, & Kohen, 2002), and parenting processes are likely to be shaped by cultural values, practices, and customs (Bornstein, 1995; Bornstein, Putnick, Lansford, Deater-Deckard, & Bradley, 2015). To date, the number of within-group studies examining the contribution of parenting processes to individual differences in child development in Latin America is highly limited given that most research including Latinos thus far has focused on cross-cultural comparisons within the US (Halgunseth, Ispa, & Rudy, 2006). The current study aims at reducing this research gap by focusing on the interrelations between SES, ethnicity, parental belief, parenting practices and preschool children's school readiness and executive functioning in a bi-ethnic (indigenous Mapuche or Chilean), low-SES sample in the Latin-American context of Chile.

School Readiness and Executive Functions

School readiness is a complex concept. What is it that children really need to be prepared for school? In the midst of a heated debate the US School Readiness Act of 2005 (2005) suggests the following developmental focus areas for Head Start children before school entry: (1) language knowledge and skills, (2) early literacy knowledge and skills, (3) early math knowledge and skills, and (4) cognitive abilities related to academic achievement, and (5) social and emotional development related to early learning. This list is by no means exhaustive, nevertheless it provides a good starting point especially regarding the cognitive domain of school readiness. Most of the developmental areas of

the Head Start School Readiness Act are self-explanatory, but the fourth area mentioned needs further elaboration. Numerous authors have advocated the importance of executive functions (EFs) as basic cognitive abilities when it comes to learning (Blair, 2002; Espy et al., 2004). EFs are an umbrella concept for working memory, inhibitory control (attentional, cognitive, and behavioral inhibition) and cognitive flexibility (Diamond, 2013). In the current study we focus on early literacy, early math, and EFs abilities. For conceptual clarity we use the term 'school readiness' to refer to the classic school readiness components 'early-literacy' and 'early-math' and investigate EFs independently (Diamond, 2002), as it is yet unclear whether EFs share the same underlying neural networks and cognitive mechanisms with early literacy (Gaillard, Balsamo, Ibrahim, Sachs, & Xu, 2003; Yamanda, 2011) and early math (Bonny & Lourenco, 2013; Emerson, & Cantlon, 2012). A meta-analysis has found that math and reading abilities seem to tap into a common more general cognitive ability, which was among other things substantiated by similar associations of math and reading to intelligence (Yeniad, Malda, Mesman, Van IJzendoorn, Pieper, 2013). Evidence also shows that intelligence involves distinct cognitive processes from EFs (Diamond, Prevor, Callendar, & Druin, 1997). As preschooler's school readiness and EFs are vital to later school achievement and job success (Diamond, 2013; Duncan et al., 2007), it is important to study their predictors, such as parenting processes and family characteristics.

Parenting Predictors of School Readiness and EFs

Children's school readiness and EFs are affected by parental beliefs and the quality of parenting practices (Chazan-Cohen et al., 2009; Pelletier & Brent, 2002). In the current study we therefore investigate both parental beliefs (focusing on parental self-efficacy) and parenting practices (focusing on parental cognitive stimulation and maternal supportive discipline).

Parental self-efficacy. Montigny (2005) defined perceived parental self-efficacy as "beliefs or judgments parents hold of their capabilities to organize and execute a set of tasks related to parenting a child" (p. 390). Self-efficacy beliefs exert their influence through cognitive, motivational, affective, and selection processes (Bandura, 1993, Montigny, 2005). Parental functioning can be either enhanced or undermined by perceptions of self-efficacy. A review of Western literature indicates that there is strong evidence linking parental

self-efficacy to parental competence and positive parenting (Jones & Prinz, 2005). Studies support an indirect relation between parental self-efficacy and child school performance via parenting practices (Ardelt & Eccles, 2001; Jones & Prinz, 2005; Pelletier & Brent, 2002; Waanders, Mendez, & Downer, 2007). To our knowledge the relations between parental self-efficacy and child EFs have not been examined thus far.

Parental cognitive stimulation. Parents create material and psychosocial home environments that affect child learning and development. The material dimension of a child's home environment is manifested by availability of a variety of age-appropriate learning materials (such as books and toys), whereas the psychosocial dimension is expressed in the parental provision of linguistic and cognitive stimulation (Caldwell & Bradley, 2003). Research in Western countries has reported that children who grow up in more cognitively stimulating homes during early childhood, demonstrate improved school readiness (Mistry, Benner, Biesanz Clark, & Howes, 2010; Melhuish, Phan, Sylva, Sammons, Siraj-Blatchford, Taggart, 2008) and EF abilities (Clark et al., 2013; Hackman, 2012; NICHD EECRN, 2005) in preschool and primary school.

Maternal supportive discipline. Supportive discipline is a hybrid originating from two different yet related parenting practices traditions: the term *supportiveness* is derived from attachment theory and refers to the parent's ability to sensitively respond to the child's signals (Ainsworth, 1985), whereas the term *discipline* originates from Baumrind's authoritative parenting style and indicates the parent's ability to positively control the child's behavior (Baumrind, 1971). Supportive discipline thus encompasses the parent's efforts to get the child to do (or not do) something by using sensitive and warm behavioral control strategies (Van Zeijl et al., 2006). Research consistently links both components of the supportive discipline concept to more favorable cognitive child outcomes, because mothers who appropriately respond to their children's needs and are consistent with limit setting, teach their children not only attentional and communicative skills, but also the ability to regulate their emotion and behavior. In Western samples, parent-child interactions characterized by parental warmth, acceptance, responsiveness, support, encouragement, involvement, appropriate control, structure, and limit setting were found to be associated with enhanced school readiness (Chazan-Cohen

et al., 2009; McGrath, Sullivan, & Seifer, 1998; Parker, Boak, Griffin, Ripple, & Peay, 1999) and EFs (Blair et al., 2011; NICHD ECCRN, 2005; Rhoades, Greenberg, Lanza, & Blair, 2011) prior to school entry. One study reported that parenting quality measured as supportiveness and sensitivity mediated the effects of family resources on children's cognitive performance (language and EF) across the first three years of life (Lugo-Gil & Tamis-LeMonda, 2008).

Family Characteristics, School Readiness, and EFs

SES and ethnic background are particularly relevant to the study of school readiness and EF abilities during early childhood as their complex interplay impacts preschoolers' socialization processes in manifold ways.

Socioeconomic status. SES is commonly conceptualized as the social class to which an individual belongs and is estimated by household income, material resources, education and occupation. Genetic factors (Bartels, Rietveld, Van Baal, & Boomsma, 2002) and environmental factors (Evans, 2004) are both partially responsible for the well-established associations between family SES and cognitive child outcomes such as language development, intelligence, and academic achievement (Bradley & Corwyn, 2002, Guo, & Harris, 2000; Hart & Risely, 1995; Sirin, 2005). SES is also found to be responsible for the school entry gap, meaning that low-SES children consistently lag behind their higher SES classmates on reading and math school readiness abilities (Janus & Duku, 2007; Coley, 2002). Several studies have found that children and adolescents from higher SES outperform their low-SES counterparts on EFs tasks such as verbal and spatial working memory, inhibitory control, cognitive flexibility, planning and alerting, orienting, and executive attention (Hackman 2012; Lipina, Martelli, Vuelta, & Colombo, 2005; Mezzacappa, 2004; Noble, McCandliss, & Farah, 2007; Sarsour et. al 2011). A review backs up the claim that SES plays a key role in children's neurocognitive performance, particularly of language and EFs (Hackman & Farah, 2009).

The Family Stress Model (FSM) explains how SES sets in motion distinct mechanisms operating within the family that codetermine differential child outcomes. According to the FSM, high family economic pressure leads to parental emotional distress, which predicts increased marital conflict and reduced marital warmth and support. Consequently children receive less nurturance and involved parenting, which in turn negatively affects their

emotional, behavioral, cognitive and physical developmental outcomes (Conger & Donnellan, 2007). In agreement with FSM predictions, parenting practices such as parental warmth, stimulation and responsivity have been demonstrated to suffer under socioeconomic hardship (Bradley & Corwyn, 2002; Conger & Donnellan, 2007; Linver, Brooks-Gunn, & Kohen, 2002).

Ethnicity. Minority group members are often victims of restricted socioeconomic opportunities and mobility. Due to the common co-occurrence of minority group status and low SES it is challenging to isolate their individual contributions to child development. Minority group members are furthermore likely to suffer individual or institutional discrimination, racism, marginalization, and the stigma of inferiority (Williams, 1999). The Mapuche in Chile suffer a comparable fate (Merino, 2007), but as an indigenous ethnic minority group they likely experience additional stressors such as loss of lands, culture, language and identity, and adjustment to the dominant culture and life-style (King, Smith, & Gracey, 2009). Stressors and low SES can both negatively impact parenting and child development according to the FSM. Therefore it is necessary to investigate whether family processes vary between the two ethnic groups under study, although the vast majority of the national Mapuche population (80%) has been urbanized and acculturated to the dominant Chilean culture, language, religion, and life-style (work, housing, health and education), which makes them largely indistinguishable on demographic characteristics from majority group members of the same social class (Caniguan, 2012).

Research in the Latin-American Context

Considering the importance of cultural contributions to child-rearing, it is surprising that 88% of the world's population are not represented in behavioral and developmental science, as research is almost exclusively conducted in Western countries (Henrich, Heine, & Norenzayan, 2010). Latin-America is no exception to the rule; to the best of our knowledge we are the first to examine whether maternal self-efficacy, parental cognitive stimulation, and maternal supportive discipline predict school readiness and EFs in the cultural context of Chile. It is crucial to address this knowledge gap, because parental beliefs and parenting practices are likely to vary as a result of unique cultural values, practices, and customs and may thus differentially predict child outcomes. The few research that was conducted in Latin American countries showed

for instance that parents in Latin America placed less emphasis on cognitive stimulation and teaching of academic skills than parents in Western countries, and that parental responsivity in Paraguay and Argentina was lower than in the US, whereas parental responsivity in Costa Rica and Chile was not much lower (Bradley & Corwyn; 2005). This cultural practice coupled with generally poorer living conditions in Latin America expressed in less availability of toys and learning materials, may thus lead to less school readiness and EF abilities. In sum, low-SES children growing up in less stimulating, responsive and supportive homes seem to face many additional challenges when it comes to cognitive development. The first findings from Chile corroborate that SES-related developmental differences emerge during early childhood, and that there is a considerable association between family income, maternal education, cognitive and non-cognitive development, and the health of children (Contreras & Gonzalez, 2015). These relations however need to be explored further.

Current Study

We examine whether SES, ethnicity, maternal self-efficacy, parental cognitive stimulation, and maternal supportive discipline are associated with individual differences in Chilean preschool children's school readiness and EFs. We test the following hypotheses in a novel bi-ethnic population, composed of indigenous Mapuche minority and Chilean majority families from low-SES backgrounds:

1.) Higher SES, ethnic majority status, higher maternal self-efficacy, higher parental cognitive stimulation, and higher maternal supportive discipline predict more favorable school readiness and EFs abilities among preschool children in Chile.
2.) Parental beliefs and parenting practices mediate the association between SES and school readiness and EFs respectively.

Method

Participants

The current study is a follow-up of the longitudinal Magellan-Leiden Childcare Study, which started in February 2012 with 110 mothers and their 6-months-old infants (Cárcamo, Vermeer, Van der Veer, & Van IJzendoorn,

2015). The initial sample was drawn from three public health centers and records of 19 public daycare centers in the Araucanía region and on Chiloé Island (Lake region) in the south of Chile. Attrition reduced the number of participants in the latest sample of the longitudinal study. From the initial 110 mother-child-dyads, 95 (86%) participated at Time 2 (mean child age 15 months), 79 (72%) at Time 3 (mean child age 42 months), and 80 (71%) at Time 4 (mean child age 61 months). Reasons for non-participation were that families moved residence and did not leave any contact address or telephone number, they moved out of the study area or they had no time (e.g. due to the birth of another baby). In the current study we report on data from Time 3 (January 2015) and Time 4 (August to October 2016). Almost all of the remaining 80 mother-child-dyads participated at all four time points with the exception of 6 dyads who were not available at Time 3. Ten dyads of the remaining 80 were excluded from analysis due to missing variables (mostly related to non-participation at Time 3 or non-collaboration of the child during testing at Time 4), resulting in a final current sample of 70 mother-child-dyads who participated at the last two time points (Time 3 and Time 4).

We compared characteristics of the dropouts at Time 1 with those of the remaining sample at Time 4. An independent t-test indicated that there was a significant difference between the drop outs [$n = 40$; $M = 23.181$; $SD = 5.67$] and the current participants [$n = 70$; $M = 26.63$; $SD = 7.76$] in terms of maternal age [$t(108) = -2.47, p < .05$]. Young mothers in their late teens or early twenties tended to be unavailable for participation at Time 4. A Chi-square test revealed another significant difference between the drop-outs and current participants on SES [$\chi^2(1, N = 110) = 28.00, p < .01$]. Almost all of the 40 families (95%) that discontinued their participation were from the lowest SES backgrounds. Population data at Time 1 indicated that attrition was not related to child gender [$\chi^2(1, N = 110) = 0.13, p = .72$], ethnicity [$\chi^2(1, N = 110) = 0.12, p = .91$] and marital status [$\chi^2(1, N = 110) = 0.26, p = .61$].

For conciseness and clarity we decided to report the sample demographics of the most recent time point only. The Time 4 participants are from lower class ethnic majority Chilean (n=43) and ethnic minority indigenous Mapuche (n=27) background. Mean per capita household income was 2.26 ($SD = 1.07$) on a 5 point scale according to national quintile distribution (for details about SES assessment see 'Measures' subsection). Mothers' educational level was distributed as follows ($M = 2.34$; $SD = 0.89$, on a 4 point scale): 16 % either

only completed primary school or did not complete secondary school, 47 % completed secondary school, 24 % completed vocational school, and 13 % completed university studies. It is important to note that the mean per capita income level in our sample is below the mean national monthly per capita income and in terms of education our participating mothers are at the average level compared to a large nationally representative sample (Cárcamo et al., 2015). This is consistent with the characterization of our current sample as 'low-SES'. All primary caregivers were mothers; their mean age was 31 years and mean child age was 61 months. Forty-four percent of the children were raised by a single parent and 59 % were boys. Characteristics of mothers and children are displayed in Table 1.

Table 1
Descriptive statistics of cognitive child outcomes, parental beliefs and parenting practices, and family characteristics (N=70)

		M	SD	Min	Max
School readiness[a]					
School readiness[b] (61 mos.)		---	5.80	-9.80	17.80
Executive functions					
Task switching (61 mos.)		44.44	30.31	0.00	100.00
Parenting					
Maternal self-efficacy (average 42-61 mos.)		8.00	1.30	4.65	10.00
Parental cognitive stimulation (average 42-61 mos.)		66.71	11.72	36.96	86.96
Maternal supportive discipline (42 mos.)		4.60	1.60	1.50	7.00
Family characteristics (61 mos.)					
Maternal age (years)		30.86	7.75	21.00	49.00
Child age (months)		60.91	1.34	58.00	63.00
Maternal education		2.34	0.90	1.00	4.00
Income per capita		2.26	1.07	1.00	5.00
SES [b]		---	1.62	-2.66	3.27
		N	%		
Ethnicity	Mapuche	27	38.60		
	Chilean	43	61.40		
Child gender	Male	41	58.60		
	Female	29	41.40		
Parents	One parent	31	44.30		
	Two parents	39	55.70		

[a] school readiness = combined scores of early math and early literacy
[b] sum of z-score values with a mean of 0

Procedure

Ethical approval was obtained by the Ethical Committee Board of Leiden University (The Netherlands). Time 3 data were collected by six trained female undergraduate psychology students of the Autónoma University Temuco, Chile, and Time 4 data were collected by six trained female undergraduate psychology students of the Catholic University Temuco, Chile. Participating dyads received two home visits in January and February 2015 (Time 3) and two home visits between August and October 2016 (Time 4). Each home visit took approximately 90 minutes and during the respective first visit the primary caregiver was informed about the subsequent data collection procedure and invited to continue participating, after which the informed consent form was signed. Arrangements were made to ensure that non-participating siblings were not at home; in case they were, a research assistant nanny would play with them in a separate room. During the Time 3 home visits the quality of the home environment was assessed and mothers' disciplining behavior was videotaped for subsequent coding. Furthermore, mothers filled out questionnaires about family characteristics (education, employment, income), family and household composition, the child's health and daycare attendance, major life events, and perceived self-efficacy. During the Time 4 home visits all Time 3 measures were repeated and additionally children's school readiness and EFs abilities were tested. Tests were administered to all children according to a standardized sequential order and all testing was either audio or video recorded to be able to decide on scoring afterwards in case of ambiguous answers. The families received a 10,000 CLP (US$ 15) voucher of a local supermarket or convenient store as remuneration for their collaboration.

Measures

Maternal self-efficacy. The parental evaluation scale (Escala de Evaluación Parental - EEP) was used to assess self-efficacy concerning the maternal role and maternal satisfaction (Farkas-Klein, 2008). It consists of 10 items, 7 of which are reversed. Mothers were asked to fill out the questionnaire and indicate their level of self-efficacy and satisfaction on an 11 point (0-10) Likert scale ranging from "totally disagree" to "totally agree". Mean scores of Time 3 and Time 4 measurements were summed and divided by two, whereby higher scores indicate higher levels of maternal self-efficacy. The EEP has shown good internal consistency reliability (Cronbach's $\alpha = .85$) in a Chilean context

(Farkas-Klein, 2008). In the current study internal consistency was adequate (Cronbach's alpha was .68 for Time 3 and .82 for Time 4).

Quality of home environment. The Early Childhood Home Observation for Measurement of the Environment (EC-HOME; Caldwell & Bradley, 2003) was used to measure quality and quantity of stimulation and support available to a child in the home environment at Time 3 and Time 4. The EC-HOME is both comprised of two parts: an observation of the home environment followed by a semi-structured interview with the primary caregiver of approximately 30 min each. The EC-HOME has been administered in many countries around the world including Chile and its validity for minority and low-SES groups has been well established (Bradley, Corwyn, McAdoo, & Garcia Coll, 2001; Bustos, Correa, Herrera & Mathiesen, 2001). The EC-HOME assessment was performed by the research assistants after an extensive training period (studying the manual, discussing items, video-scoring, and a pilot home visit). Observers achieved an average of 94% agreement at Time 3 and 93% agreement at Time 4 with expert scoring. For the purpose of this study only three subscales including 23 binary choice items (negative = 0, positive = 1) assessing parental cognitive stimulation available to the child in the home were included in the analyses: learning materials (11 items), language stimulation (7 items), and academic stimulation (5 items). The items were summed into a total score and then transformed into percentage scores, whereby higher scores indicate higher parental cognitive stimulation. Internal consistency of the instrument yielded a Cronbach's alpha of .64 at Time 3 and of .76 at Time 4. In two families it was not possible to administer the EC-HOME at time 4. In these cases we used the EC-HOME scores at Time 3 as best estimate. The cognitive stimulation subscales of both time points (Time 3 and Time 4) were combined into one global indicator of parental cognitive stimulation.

Maternal supportive discipline. During the Time 3 visit, maternal discipline was videotaped based on a 4 minute 'don't-touch' task. Mothers were given a bag of attractive toys, were instructed to place the toys in front of the child, and to make sure the child would not touch the toys for 2 minutes, after which the child was only allowed to play with the least attractive toy (a small teddy bear) for an additional two minutes. The Supportive Presence Scale was used to rate mothers' support during the 'don't touch' task (Egeland, Erickson,

Clemenhagen-Moon, Hiester, & Korfmacher,1990). Supportive presence consists of the mothers' positive regard and emotional support to the child by acknowledging the child's accomplishments, encouraging the child, being actively involved, reassuring, and calming. Supportive discipline refers to the mother's supportive presence in a discipline situation. The scale ranges from 1 (*completely failing to be supportive*) to 7 (*skillfully providing support*). We also coded four other maternal discipline strategies (physical intervention, harsh physical intervention, laxness, verbal over-reactivity), that could not be used in the analyses due to insufficient variance. All videos were coded by the first author after being trained by an expert coder and achieving an intraclass correlation coefficient (ICC; single measure, absolute agreement) of .73 on a training video set. To guarantee accuracy of scoring 10 of the 70 video recordings (14%) were additionally double coded by two expert coders (5 video's each). The ICC of the supportive discipline scale on double codifications at the beginning and after 50% of the scoring exceeded .90

School readiness. Four measures of early math and four measures of early literacy were administered to the participating preschoolers. The four measures of early math consisted of an Oral Counting task and three tasks of the Assessing Student Proficiency in Early Number Sense test (ASPENS) developed by Clarke, Gersten, Dimino, & Rolfhus (2012). The ASPENS was designed for children between 5 and 7 years of age (kindergartners and 1st graders in the US) and includes Number Identification, Magnitude Comparison, and Missing Number tasks. The ASPENS shows adequate test-retest reliability ranging in the .70s and .80s. Criterion predictive validity and criterion concurrent validity correlations were found to be reasonable (.54 and .58. respectively) for Kindergartners. The ASPENS was translated into Spanish by the first author and adapted to pre-K level so that only numbers between 0 and 10 were presented to the preschoolers (instead of from 0 to 20 as in the original version).

To measure early literacy four of twelve subtests of the Prueba de Alfabetización Inicial (PAI) – Early Literacy Test were used. The PAI was developed in Chile for children between 5 and 7 years to measure phonological awareness, awareness of printed texts, knowledge of the alphabet, reading and writing (Villalón & Rolla, 2008). We included two tests of phonological awareness (rhymes and identifying the initial letter), awareness of printed texts, and letter identification. As our participating children were in Pre-K

no reading or writing tasks were selected. The PAI has been validated in Peru, showing high internal consistency (α = .96) (Bonilla Caviedes, Botteri Gálvez, & Vílchez Charún, 2013). In our sample Pearson correlations ranged from .52 to .76 for the five subscales (phonological awareness, awareness of printed texts, knowledge of the alphabet, reading and writing). We computed standardized scores of all subscales based on which we created sum-scores for early math and early literacy respectively. Early math and early literacy showed a significant Pearson correlation of .74 and were therefore summed to create one global indicator of school readiness. Hereunder the reader will find a short summary of all eight school readiness measures, which took 15-20 minutes to administer in total. For a detailed description of the early math and literacy tasks see authors (Clarke, Gersten, Dimino, & Rolfhus, 2012; Clarke & Shinn, 2004; Villalón & Rolla, 2008).

Oral Counting Task. The child is asked to count orally starting with 1 (one minute time limit). *Number Identification Task.* The child is asked to orally identify numbers between 0 and 10 when presented with printed numbers (one minute time limit). *Magnitude Comparison Task.* The child is shown number pairs between 0 and 10 and asked to name which of the two numbers is larger (one minute time limit). *Missing Number Task.* The child is shown number strings and asked to name the missing number from a series of three numbers between 1 and 10 (e.g: 1__3) (one minute time limit). *Phonological Awareness I (rhymes).* The research assistant names three objects of the presented pictures and asks the child to identify the word that does not rhyme with the other two words (e.g. honey, fork, bunny). *Phonological Awareness II (identifying the initial letter).* The research assistant names three objects of the presented pictures and asks the child to identify the word that begins with a different sound compared to the other two words (e.g.: cat, book, bug). *Awareness of Printed Texts.* The child is shown ten boxes each with a short written text and is asked to identify a certain fragment of the printed text (e.g. the first letter, the final dot, the capital letter). *Letter Identification.* The child is shown a sheet with the Spanish alphabet in sequential order and is asked to identify as many of the 27 letters as possible.

Executive functions. The Dimensional Change Card Sorting (DCCS) task was chosen because it is an excellent global indicator of EF abilities (Diamond, Carlson, & Beck, 2005; Kirkham, Cruess, & Diamond, 2003). The DCCS like

all task-switching paradigms requires children to resist the dominant response (inhibitory control), to flexibly adapt to changing situations (cognitive flexibility), and to keep rules in mind to some extent (working memory) (Diamond, Carlson, & Beck, 2005). The DCCS was administered by research assistants after an extensive training period (studying the instructions, watching a training video provided by Diamond, practice sessions, and a pilot home visit with non-participating children). In this task, after sorting cards according to a certain dimension (e.g., color), the child is required to begin sorting by a different dimension (e.g., shape), followed by a mixed trial in which shape and color are offered in a pseudo random order. Test administration takes 10-15 minutes. The sorting cards match the model cards on two dimensions, consequently the child has to inhibit sorting by the other dimension. The final scores are based on the mixed sorting task only, as it assesses children's task switching ability. For every correct switch (from color to shape or vice versa) of eleven total switch trials one point was given. The total scores were transformed into percentage scores, whereby higher scores indicate more correct switches.

SES and ethnicity. These family characteristics were included in the analyses as control variables. Socioeconomic status was determined based on maternal education and per capita income. The level of maternal education was self-reported in a questionnaire at time 4 on a 1-4 point scale (1=incomplete primary or secondary school; 2 = secondary school completed; 3= vocational education; 4= university studies). Eleven mothers did not report their educational level. In these cases the missing data was replaced with maternal educational level at Time 3 as best estimate. At Time 4, mothers also indicated their total gross monthly household income in Chilean Pesos (CLP) divided by the number of household members. This resulted in five income per capita answer categories: less than 74,969 Chilean Pesos (US$ 112) (1), between 74,970 and 125,558 CLP (US$ 187) (2), between 125,559 and 193,104 CLP (US$ 288) (3), between 193,105 and 352,743 CLP (US$ 527) (4) and more than 352,744 CLP (5). The socioeconomic categorization is based on the five quintiles of the Chilean Ministry of Social Development (CASEN, 2013). Eight mothers did not report their income; in these cases the missing information was replaced with the Time 3 income measure as best estimate. The maternal educational level and per capita income level were combined into one global indicator of SES by summing the standardized scores of both measures. The ethnicity of

the participating mother-child-dyads was determined by self-report (Cárcamo et al., 2015). Dyads were defined as Mapuche, when mothers stated that their children grow up in a Mapuche family.

Analysis Plan

School readiness and EF measures, maternal self-efficacy, parental cognitive stimulation, maternal supportive discipline, and SES were inspected for outliers defined as values with SD greater than 3.29 above the mean (Tabachnick & Fidell, 1996). No outliers were found and all variables were normally distributed. Pearson correlation coefficients were computed to inspect the bivariate associations between all variables.

Hierarchical multiple regression analyses (HMR) were conducted to test whether school readiness and EFs at 61 months varied as a function of average maternal self-efficacy from 42 to 61 months (0-10 scale), average parental cognitive stimulation from 42 to 61 months (percentage), maternal and supportive discipline at 42 months (1-7 scale), controlling for SES at 61 months (1-5 scale) and ethnicity (0 = Chilean majority; 1 = Mapuche minority).

If assumptions for mediation were met, mediation analyses were performed to examine whether SES had an indirect effect on outcomes variables through parental beliefs (self-efficacy) or parenting practices (parental cognitive stimulation and maternal supportive discipline). The Preacher and Hayes method to test mediation was applied using the macro package for SPSS available online which allows for multiple mediators. This test is not based on large-sample theory, meaning it can be applied to small samples with more confidence. This method adopts the bootstrapping approach which, unlike the Sobel test, respects the non-normality of the sampling distribution of the indirect effect (Preacher & Hayes, 2008). This approach bootstraps the sampling distribution of the indirect effect and derives a confidence interval with the empirically derived bootstrapped sampling distribution (Preacher & Hayes, 2004). The bootstrapping is accomplished by taking a large number of samples of the original sample from the data and computing the indirect effect in each sample, which is also called sampling with replacement. Five thousand bootstrap resamples were generated and the significance of the indirect effect was tested using bias-corrected bootstrap 95% confidence intervals.

Results

Bivariate Associations between Predictors and Outcomes

Pearson correlations were calculated for all variables. Maternal supportive discipline and school readiness were significantly associated, and parental cognitive stimulation and school readiness were marginally significantly associated. Correlations between family characteristics, parental beliefs, parenting practices, and developmental child outcomes are displayed in Table 2.

Table 2
Pearson correlations between family characteristics, parental beliefs, parenting practices, and cognitive child outcomes (N=70)

		1	2	3	4	5	6	7
1	SES (61 mos.)	–						
2	Ethnicity	.02	–					
3	Maternal self-efficacy (average 42-61 mos.)	.08	-.08	–				
4	Parental cognitive stimulation (average 42-61 mos.)	.49**	.03	.11	–			
5	Maternal supportive discipline (42 mos.)	.39**	.07	.12	.18	–		
6	Executive functions (61 mos.)	.18	-.10	.05	.00	.10	–	
7	School readiness (61 mos.)	.19	.05	-.15	.23	.29*	.31**	–

* $p < 0.05$, ** $p<0.01$

Predicting School Readiness and EFs

Two two-stage hierarchical multiple regression analyses were conducted with school readiness (Model 1) and EFs (Model 2) as respective outcome variables. SES and ethnicity were entered at stage one of the regression to control for demographic background variables. Maternal self-efficacy, parental cognitive stimulation, and maternal supportive discipline were entered at stage two into each model. At stage one the demographic background variables neither significantly predicted school readiness [$F(2,67) = 1.34$, $p = .27$], nor EFs [$F(2,67) = 2.35$, $p = .24$]. At stage two in Model 1 maternal self-efficacy, parental cognitive stimulation, and maternal supportive discipline variables contributed significantly to the prediction of school readiness [$F(5,64) = 2.35$,

Table 3

Hierarchical regression analyses predicting school readiness and executive functions from parental beliefs and parenting practices (N=70)

	Model 1		Model 2	
	School readiness [a]		Executive functions [b]	
	R^2 = .04	R^2 = .16	R^2 = .04	R^2 = .06
	p = .27	p = .05	p = .24	p = .60
Predictors	β	β	β	β
SES (61 mos.)	.19	.00	.18	.22
Ethnicity	.04	.01	-.10	-.10
Maternal self-efficacy (average 42-61 mos.)		-20		.04
Parental cognitive stimulation (average 42-61 mos.)		.20		-.12
Maternal supportive discipline (42 mos.)		.28*		.04

[a] PAI = Prueba de Afabetización Inicial / Early Literacy Test (Villalón & Rolla, 2008)

[a] ASPENS = Assessing Student Proficiency in Early Number Sense: Clarke, Gersten, Dimino, & Rolfhus, (2012)

[b] Dimensional Change Card Sorting Test (Diamond, Carlson, & Beck, 2005)

* p < .05, ** p< .01

$p = 0.05$], over and above SES and ethnicity, and together accounted for 16% of the variance. We found a significant positive main effect of maternal supportive discipline on school readiness (see Table 3). In Model 2 at stage two none of the three parenting variables predicted EFs [$F(5,64) = 0.74$, $p = 0.60$]. Table 3 shows the results of the hierarchical multiple regression analyses.

Testing Mediation

Based on the bivariate correlation results, two of the six possible mediation models were tested, examining whether parental cognitive stimulation and maternal supportive discipline fully or partially mediated the relation between SES and school readiness. We found no significant mediation effect for parental cognitive stimulation; β = .09, *SE* = 0.06, 95% CI, BCaCI [-0.02, 0.22]. The mediation effect for maternal supportive discipline in the relation between SES and school readiness reached significance, as illustrated in Figure 1. The figure shows that the standardized regression coefficient between SES and maternal supportive discipline was significant, as was the standardized regression coefficient between maternal supportive discipline and school readiness. A simple association between the predictor (SES) and the outcome (school readiness) is not required in order to test mediation hypotheses (Hayes, 2009). We examined the significance of this indirect effect (the indirect effect of *X* on *Y* is defined as the product of the *X* →*M* path and the *M*→*Y* path) using the previously described bootstrapping procedures by Preacher and Hayes (2004, 2008). The direct relation between SES and school readiness diminished when maternal supportive discipline was included in the model, indicating partial mediation. The mediation analysis revealed that the indirect effect from SES to school readiness through maternal supportive discipline was significant, β = .10, *SE* = 0.06, 95% CI, BCaCI [0.01, 0.23]. The bootstrapped standardized indirect effect was .10, and the 95% Bias Corrected and Accelerated Confidence Interval ranged from 0.01 to 0.23. The lower and upper limit of the Confidence Interval did not pass through zero, which means that the indirect effect is statistically significant. The mediator thus accounted for roughly half of the total effect of SES on school readiness.

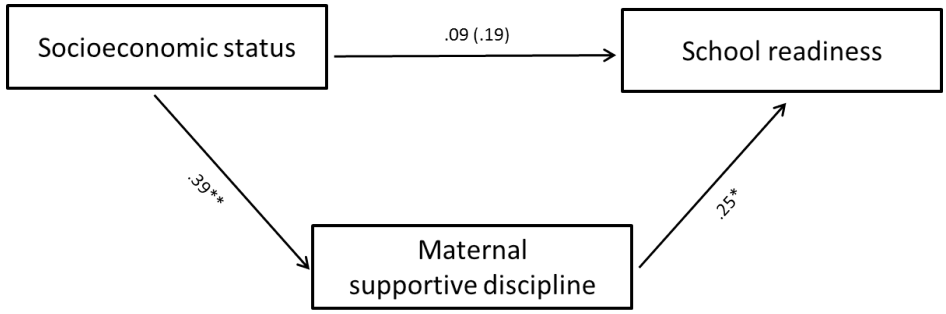

Figure 1. The mediating role of maternal supportive discipline in the relation between socioeconomic status and school readiness (N = 70). Numbers represent standardized coefficients (β). The coefficient prior to the parentheses depicts the association between SES and school readiness, controlling for maternal supportive discipline, whereas the coefficient within the parentheses reflects the total effect (direct effect + indirect effect) without controlling for the mediator. $^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$.

Discussion

Our results showed that higher maternal supportive discipline predicted higher school readiness abilities in preschool children, even after taking SES and ethnicity into account. Our second hypothesis regarding the mediating roles of parental beliefs and parenting practices in the relation between SES and child outcomes was in part confirmed: maternal supportive discipline partially mediated the relation between SES and school readiness. Contrary to expectations, our analyses revealed no further main or mediation effects.

Children who received higher levels of maternal supportive discipline at 3½ years showed more school readiness abilities at age 5. This is consistent with our hypothesis based on previous research in Western countries (Chazan-Cohen et al., 2009; Connell & Prinz, 2002; Hill, 2001). We are the first to replicate this finding in a bi-ethnic low-SES sample in Chile, including indigenous Mapuche minority and Chilean majority families. In line with Ainsworth's attachment theory and Baumrind's theory of parenting styles we found that parents who are sensitive, responsive, nurturing, and consistent with limit-setting have more successful children and we can thus confirm applicability of these parenting practices in Chile.

The mediating role of maternal supportive discipline in the association between SES and school readiness was in line with our expectations. Low-SES mothers provided less supportive discipline and their children also showed less school readiness abilities. Our findings thus support the Family Stress Model stating that economic hardship leads to parental emotional distress, which predicts that children receive less nurturance and involved parenting. This cascade of mechanisms operating within the family ultimately codetermines differential cognitive child outcomes (Conger & Donnellan, 2007). The large-scale randomized controlled Early Head Start Research and Evaluation Study has found that parenting quality (supportiveness, sensitivity, responsiveness and stimulation) in a low-income US sample mediated the effects of family resources on children's cognitive performance (language, early math, and EFs) across the first three years of life (Lugo-Gil & Tamis-LeMonda, 2008). We replicated this finding, with a focus on maternal supportive discipline, for children of preschool age in a Latin-American cultural context. If these findings consolidate improving parenting practices can be a window of opportunity for tailored interventions.

Several findings were contrary to our expectations. First, maternal self-efficacy did not explain individual differences in Chilean preschool children's school readiness. Inspection of the score distribution shows that there may have been range restriction as indicated by a high mean score (8 on an 0-10 point scale) and virtually no mothers in the lower ranges. Prior research has found that collectivist cultures (especially Latino culture with a high desire for harmony and belonging to the group), minority groups and women are more likely to give socially desirable answers (Bernardi, 2006; Fisher & Katz, 2008). Therefore, mothers in our sample might have inflated their self-efficacy scores, and as such yielded insufficient (valid) variance for meaningful relations with other variables. Second, parental cognitive stimulation did not explain children's individual differences in school readiness abilities. It has been documented that parents can foster school readiness by providing their children with preacademic stimulation such as reading to them, helping them to write their first words, assisting them to count objects, and animating them to recognize and pronounce sounds, letters and words (e.g. Bakermans-Kranenburg, van IJzendoorn, & Bradley, 2005; Leventhal, Martin, & Brooks-Gunn, 2004). The HOME inventory might not have adequately captured these aspects of parenting as it does not measure how often and how well parents actually

engage in certain stimulating behaviors and should therefore not be interpreted as a continuous measure of actual early childhood experience, but rather as an indicator of higher versus lower levels of parental support (Bradley, Corwyn, McAdoo, & Garcia Coll, 2001; Leventhal, Selner-O'Hagan, Brooks-Gunn, Bingenheimer, & Earls, 2004). Furthermore, these null findings might be due to a limited sample size and the fact that a considerable part of the language and academic stimulation items are interview and not observation items and hence could be biased by mothers' perceptions. A third unexpected result of our study was that children's EFs were unaffected by parental beliefs or parenting practices. These results are inconsistent with Western research linking parental stimulation and maternal supportiveness with EFs (NICHD ECCRN, 2005; Rhoades, Greenberg, Lanza, & Blair, 2011). It is conceivable that different cultural templates affect the manifestations and meanings of parenting practices in non-Western samples (Halgunseth, Ispa, & Rudy, 2006). Future research is needed to examine whether underlying cultural parenting mechanisms affect children's EF development in Latin-American populations. It is also possible, that these null findings reflect a fundamental difference between the two child outcome measures under study. School readiness abilities such as early math and early literacy are not only taught formally to children in preschool by teachers, but most parents also make a conscious effort to teach these concrete abilities to their children and can enjoy fairly immediate straightforward results. Although EFs can be trained, it is a long-term process without directly visible results and hence so far only few school curricula successfully do so (Diamond, 2012) and parents often lack the knowledge and skills to train their children. Our relatively limited assessments in frequency and scope of parental beliefs and behaviors may not have been sufficient to capture more covert long-term parenting processes actually relevant to EF development. A fourth result that did not align with our hypotheses is that SES and ethnicity did not directly predict child outcomes. However, an indirect effect of SES through parenting was found as was previously discussed. The absence of ethnic differences can possibly be explained by prior findings indicating that the majority of the Mapuche are largely indistinguishable regarding demographic characteristics from their Chilean compatriots due to urbanization and adaptation to the dominant culture (Caniguan, 2012). Hence it is likely that Mapuche mothers are already so estranged from their own culture that their current parental beliefs and parenting practices have become increasingly similar to those of the dominant culture, potentially replacing traditional ethnic beliefs and practices.

The unique strengths of the study include the so far understudied Latin-American cultural context of both indigenous Mapuche ethnic minority families and Chilean ethnic majority families in Chile, in combination with the longitudinal design. Other strong points are the use of multiple assessment methods including self-report, interview, task performance, and observational measures, and the integration of both school readiness (early math and literacy) and EFs as cognitive outcome measures. Additionally, the study possesses considerable ecological validity, as the mother-child-dyads were tested at home. Nevertheless, the present study also had some weaknesses, which should be taken into account when interpreting the results. First, we have to acknowledge that 36% of the original sample recruited at the start of the longitudinal study in 2012 was lost and drop-out mothers tended to be younger and from the lowest SES level. Second, the measure of family SES was not exhaustive in the sense that it did not include all dimensions of human resources in a family unit, nor did we consider a broad spectrum of parental beliefs or parenting practices. We suggest that future research aims at assessing family SES more multi-dimensionally and expands to other parenting practices such as limit-setting, scaffolding or imitational learning and parental cognitions such as achievement expectations to broaden our understanding of these family processes. Third, the Family Stress Model assumes that economic pressure leads to an increase in parental emotional and behavioral problems. However, we did not directly measure parental emotional distress and behavioral problems. Future research should consider overcoming this weakness. Fourth, we could not incorporate the Time 4 maternal supportive discipline measurement, as the outcome data did not show sufficient variability due to child age (at age 5 the 'don't touch task' did not seem to be sufficiently challenging for the mother-child dyads).

Our findings are important despite the limitations of this study, because they add to a very small body of empirical research on parenting processes in Latin-America and can help professionals working with low-SES families in the area of cognitive child development. The current study provides evidence that children of mothers with higher supportive discipline show higher school readiness abilities, and that the relation between SES and school readiness were mediated by maternal supportive discipline. These results are in line with the Family Stress Model which highlights the critical role of SES and parenting practices in predicting differential child outcomes. Our findings thus provide evidence that even marginal increases in SES can benefit parenting processes and children's

school readiness within a low-SES population. Inasmuch as SES is difficult to modify, our study hints at parenting processes as meaningful pathways for interventions. Increasing positive parenting skills (e.g. helping parents shift to warmer and more supportive interactions in the context of behavioral control strategies) in low-income homes can contribute to preparing at-risk preschool children for school entry. Indeed, promising studies show that it is possible to improve maternal supportive caregiving in low-SES and minority samples through parenting intervention programs (Negrão, Pereira, M. Soares, & Mesman 2014; Yagmur, Mesman, Malda, Bakermans-Kranenburg, & Ekmekci, 2014). However, intervention efforts should be sensitive to context as parents from different cultural backgrounds likely vary in their parental beliefs and parenting practices, and these differences are reflected in manifold subtle ways in the daily routines and experiences of their children in early childhood. For future research we would moreover like to recommend including social and emotional school readiness abilities, as Latino parents seem to place special emphasis on these areas of their children's development (Okagaki & Sternberg, 1993; Okagaki, & Frensch, 1998). In conclusion, the current study indicates that parents play a crucial role in their children's school readiness attainment and that supportive parenting can mitigate the adverse effects of low SES.

References

Ainsworth, M. D. (1985). Patterns of infant-mother attachments: antecedents and effects on development. *Bulletin of the New York Academy of Medicine*, *61*, 792–811.

Ardelt, M., & Eccles, J. S. (2001). Effects of mothers' parental efficacy beliefs and promotive parenting strategies on inner-city youth. *Journal of Family Issues*, *22*, 944–972.

Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H., & Bradley, R. H. (2005). Those who have, receive: The Matthew effect in early childhood intervention in the home environment. *Review of Educational Research, 75*, 1–26.

Bandura, A. (1993). Perceived self-efficacy in cognitive development and functioning. *Educational Psychologist*, *28*, 117–148.

Bartels, M., Rietveld, M. J., Van Baal, G. C. M., & Boomsma, D. I. (2002). Genetic and environmental influences on the development of intelligence. *Behavior Genetics*, *32*, 237–249.

Baumrind, D. (1971). Current patterns of parental authority. *Developmental Psychology*, *4*, 1–103.

Bernardi, R. A. (2006). Associations between Hofstede's cultural constructs and social desirability response bias. *Journal of Business Ethics*, *65*, 43–53.

Blair, C. (2002). School readiness: Integrating cognition and emotion in a neurobiological conceptualization of children's functioning at school entry. *American Psychologist*, *57*, 111–127.

Blair, C., Granger, D. A., Willoughby, M., Mills-Koonce, R., Cox, M., Greenberg, M. T., ... & Fortunato, C. K. (2011). Salivary cortisol mediates effects of poverty and parenting on executive functions in early childhood. *Child Development*, *82*, 1970–1984.

Bonilla Caviedes, F. N., Botteri Gálvez, A., & Vílchez Charún, A. V. (2013). Validación de la prueba de alfabetización inicial (PAI) en instituciones educativas públicas y privadas pertenecientes a la Unidad de Gestión Educativa Local No 07 (Tesis de Magister). [Standardization of the Early Literacy Test (PAI) in public and private educational institutions belonging to the Local Education Management Unit (UGEL) No 07 (Master Thesis.]. Graduate School of Education, Pontifical Catholic University of Lima, Peru. Retrieved from http://tesis.pucp.edu.pe/repositorio/handle/123456789/5021

Bonny, J. W., & Lourenco, S. F. (2013). The approximate number system and its relation to early math achievement: Evidence from the preschool years. *Journal of Experimental Child Psychology*, *114*, 375–388.

Bornstein, M. H. (1995). Form and function: Implications for studies of culture and human development. *Culture & Psychology, 1*, 123–137.

Bornstein, M. H., Putnick, D. L., Lansford, J. E., Deater-Deckard, K., & Bradley, R. H. (2015). A developmental analysis of caregiving modalities across infancy in 38 low-and middle-income countries. *Child Development*, *86*, 1571–1587.

Bradley, R. H., Corwyn, R. F., McAdoo, H. P., & Garcia Coll, C. (2001). The home environments of children in the United States part I: Variations by age, ethnicity, and poverty status. *Child Development, 72*, 1844-1867.

Bradley, R. H., & Corwyn, R. F. (2002). Socioeconomic status and child development. *Annual Review of Psychology, 53*, 371–399.

Bradley, R. H., & Corwyn, R. F. (2005). Caring for children around the world: A view from HOME. *International Journal of Behavioral Development, 29,* 468–478.

Bronfenbrenner, U. (Ed.). (2005). Making human beings human: Bioecological perspectives on human development. Thousand Oaks: SAGE Publications

Bustos-Correa, C., Herrera, M. O., & Mathiesen, M. E. (2001). Calidad del ambiente del hogar: Inventario HOME como un instrumento de medición [Quality of the home environment: The HOME inventory as a measurement instrument]. *Estudios Pedagógicos, 27*, 7–22.

Caldwell, B. M., & Bradley, R. H. (2003). *Home observation for measurement of the environment: Administration manual.* Little Rock, AR: University of Arkansas.

Caniguan, N. (2012). Infancia mapuche y migración en el Budi [Mapuche infancy and migration in the Budi]. *Revista Iberoamericana sobre Niñez y Juventud en Lucha por sus Derechos, 4*, 135–141.

Cárcamo, R. A., Vermeer, H. J., Van der Veer, R., Van IJzendoorn, M. H. (2015). Childcare in Mapuche and non-Mapuche families in Chile: the importance of socioeconomic inequality. *Journal of Child and Family Studies, 24,* 2668–2679.

CASEN - Ministry of Social Development. (2013). Quintiles in Chile defined for 2015. Retrieved from http://noticias.universia.cl/cultura/noticia/2015/10/29/1132999/quintiles-2015-cuales-sirven.html

Chazan-Cohen, R., Raikes, H., Brooks-Gunn, J., Ayoub, C., Pan, B. A., Kisker, E. E., ... & Fuligni, A. S. (2009). Low-income children's school readiness: Parent contributions over the first five years. *Early Education and Development, 20*, 958–977.

Clark, C. A., Sheffield, T. D., Chevalier, N., Nelson, J. M., Wiebe, S. A., & Espy, K. A. (2013). Charting early trajectories of executive control with the shape school. *Developmental Psychology, 49*, 1481–1493.

Clarke, B., Gersten, R., Dimino, J., & Rolfhus, E. (2012). ASPENS Administrator's handbook. Longmont, CO: Cambium Learning Group, Sopris Learning.

Clarke, B., & Shinn, M. R. (2004). A preliminary investigation into the identification and development of early mathematics curriculum-based measurement. *School Psychology Review, 33*, 234–248.

Coley, R. J. (2002). An Uneven Start: Indicators of Inequality in School Readiness. Policy Information Report. Retrieved from https://www.ets.org/Media/Research/pdf/PICUNEVENSTART.pdf

Conger, R. D., & Donnellan, M. B. (2007). An interactionist perspective on the socioeconomic context of human development. *Annual Review of Psychology, 58*, 175–99.

Connell, C. M., & Prinz, R. J. (2002). The impact of childcare and parent–child interactions on school readiness and social skills development for low-income African American children. *Journal of School Psychology, 40*, 177–193.

Contreras, D., & González, S. (2015). Determinants of early child development in Chile: Health, cognitive and demographic factors. *International Journal of Educational Development, 40*, 217-230.

Diamond, A. (2002). Normal development of prefrontal cortex from birth to young adulthood: Cognitive functions, anatomy, and biochemistry. In Stuss, D. & Knight, R. (Eds.), *Principles of frontal lobe function,* pp. 466 – 503. New York: Oxford.

Diamond, A. (2012). Activities and programs that improve children's executive functions. *Current Directions in Psychological Science, 21*, 335–341.

Diamond, A. (2013). Executive functions. *Annual Review of Psychology, 64*, 135–168.

Diamond, A., Prevor, M. B., Callendar, G., & Druin, D. P. (1997). Prefrontal cognitive deficits in children treated early and continuously for PKU. *Monographs of the Society for Research in Child Development, 62*, 1–208.

Diamond, A., Carlson, S. M., & Beck, D. M. (2005). Preschool children's performance in task switching on the dimensional change card sort task: Separating the dimensions aids the ability to switch. *Developmental Neuropsychology, 28*, 689–729.

Duncan, G. J., Dowsett, C. J., Claessens, A., Magnuson, K., Huston, A. C., Klebanov, P., ... & Sexton, H. (2007). School readiness and later achievement. *Developmental Psychology, 43*, 1428–1446.

Egeland, B., Erickson, M. F., Clemenhagen-Moon, J. C., Hiester, M. K., & Korfmacher, J. (1990). *24 months tools coding manual.* Project STEEP revised 1990 from mother– child project scales. Unpublished manuscript, University of Minnesota, Minneapolis.

Emerson, R. W., & Cantlon, J. F. (2012). Early math achievement and functional connectivity in the fronto-parietal network. *Developmental Cognitive Neuroscience, 2S*, S139–S151.

Espy, K. A., McDiarmid, M. M., Cwik, M. F., Stalets, M. M., Hamby, A., & Senn, T. E. (2004). The contribution of executive functions to emergent mathematic skills in preschool children. *Developmental Neuropsychology, 26*, 465–486.

Evans, G. W. (2004). The environment of childhood poverty. *American Psychologist, 59*, 77–92.

Farkas-Klein, C. (2008). Escala de evaluación parental (EEP): desarrollo, propiedades psicométricas y aplicaciones. *Universitas Psychologica*, 7, 457–467.

Fisher, R., & Katz, J. E. (2008). Social-desirability bias and the validity of self-reported values. *Psychology & Marketing, 17*, 105–120.

Gaillard, W. D., Balsamo, L. M., Ibrahim, Z., Sachs, B. C., & Xu, B. (2003). fMRI identifies regional specialization of neural networks for reading in young children. *Neurology, 60*, 94–100.

Guo, G., & Harris, K. M. (2000). The mechanisms mediating the effects of poverty on children's intellectual development. *Demography, 37*, 431–447.

Hackman, D. A. (2012). Socioeconomic status and the development of executive function and stress reactivity: The specific roles of parental nurturance and the home environment (PhD dissertation). Department of Psychology, University of Pennsylvania, Philadelphia, PA. Retrieved from ProQuest Dissertations & Theses Global database (Record No. 3542813).

Hackman, D. A., & Farah, M. J. (2009). Socioeconomic status and the developing brain. *Trends in Cognitive Sciences, 13*, 65–73.

Halgunseth, L. C., Ispa, J. M., & Rudy, D. (2006). Parental control in Latino families: An integrated review of the literature. *Child Development, 77*, 1282–1297.

Hart, B., & Risley, T. R. *Meaningful Differences in the Everyday Experience of Young American Children.* (Brookes Publishing, Baltimore, Maryland, 1995).

Hayes, A. F.(2009). Beyond Baron and Kenny: Statistical mediation analysis in the new millennium. *Communication Monographs, 76*, 408–420.

Henrich, J., Heine, S. J., & Norenzayan, A. (2010). The weirdest people in the world? *Behavioral and Brain Sciences, 33,* 61–135.

Hill, N. E. (2001). Parenting and academic socialization as they relate to school readiness: The roles of ethnicity and family income. *Journal of Educational Psychology, 93*, 686–697.

Janus, M., & Duku, E. (2007). The school entry gap: Socioeconomic, family, and health factors associated with children's school readiness to learn. *Early Education and Development, 18*, 375–403.

Jones, T. L., & Prinz, R. J. (2005). Potential roles of parental self-efficacy in parent and child adjustment: A review. *Clinical Psychology Review, 25*, 341–363.

King, M., Smith, A., & Gracey, M. (2009). Indigenous health part 2: the underlying causes of the health gap. *The Lancet, 374*, 76–85.

Kirkham, N. Z., Cruess, L., & Diamond, A. (2003). Helping children apply their knowledge to their behavior on a dimension-switching task. *Developmental Science, 6*, 449–467.

Leventhal, T., Martin, A., & Brooks-Gunn, J. (2004). The EC-HOME across five national data sets in the 3rd to 5th year of life. *Parenting: Science and Practice, 4*, 161–188.

Leventhal, T., Selner-O'Hagan, M. B., Brooks-Gunn, J., Bingenheimer, J. B., & Earls, F. J. (2004). The Homelife Interview from the Project on Human Development in Chicago Neighborhoods: Assessment of parenting and home environment for 3-to 15-year-olds. *Parenting, 4*, 211–241.

Linver, M. R., Brooks-Gunn, J., & Kohen, D. E. (2002). Family processes as pathways from income to young children's development. *Developmental Psychology, 38*, 719–734.

Lipina, S. J., Martelli, M. I., Vuelta, B. & Colombo, J. A. (2005). Performance on the A-not-B task of Argentinian infants from unsatisfied and satisfied basic needs homes. *Interamerican Journal of Psychology 39*, 49–60.

Lugo-Gil, J., & Tamis-LeMonda, C. S. (2008). Family resources and parenting quality: Links to children's cognitive development across the first 3 years. *Child Development, 79*, 1065–1085.

McGrath, M. M., Sullivan, M. C., & Seifer, R. (1998). Maternal interaction patterns and preschool competence in high-risk children. *Nursing Research, 47*, 309–317.

Melhuish, E. C., Phan, M. B., Sylva, K., Sammons, P., Siraj-Blatchford, I., & Taggart, B. (2008). Effects of the home learning environment and preschool center experience upon literacy and numeracy development in early primary school. *Journal of Social Issues, 64*, 95–114.

Merino, M. E. (2007). El discurso de la discriminación percibida en Mapuches de Chile.[The discourse of perceived discrimination among the Mapuche in Chile]. *Discurso & Sociedad, 1*, 604–622.

Mezzacappa, E. (2004). Alerting, orienting, and executive attention: Developmental properties and sociodemographic correlates in an epidemiological sample of young, urban children. *Child Development*, 75, 1373–1386.

Mistry, R. S., Benner, A. D., Biesanz, J. C., Clark, S. L., & Howes, C. (2010). Family and social risk, and parental investments during the early childhood years as predictors of low-income children's school readiness outcomes. *Early Childhood Research Quarterly, 25*, 432–449.

Montigny, F., & Lacharité, C. (2005). Perceived parental efficacy: Concept analysis. *Journal of Advanced Nursing, 49*, 387–396.

Negrão, M., Pereira, M., Soares, I., & Mesman, J. (2014). Enhancing positive parent-child interactions and family functioning in a poverty sample: A randomized control trial. *Attachment & Human Development, 16,* 315–328.

NICHD Early Child Care Research Network. (2005). Predicting individual differences in attention, memory, and planning in first graders from experiences at home, child care, and school. *Developmental Psychology*, 41, 99–114.

Noble, K. G., McCandliss, B. D., & Farah, M. J. (2007). Socioeconomic gradients predict individual differences in neurocognitive abilities. *Developmental Science, 10*, 464–480.

Okagaki, L., & Sternberg, R. J. (1993). Parental beliefs and children's school performance. *Child Development, 64*, 36–56.

Okagaki, L., & Frensch, P. A. (1998). Parenting and children's school achievement: A multiethnic perspective. *American Educational Research Journal, 35*, 123–144.

Parker, F. L., Boak, A. Y., Griffin, K. W., Ripple, C., & Peay, L. (1999). Parent-child relationship, home learning environment, and school readiness. *School Psychology Review, 28*, 413–425.

Pelletier, J., & Brent, J. M. (2002). Parent participation in children's school readiness: The effects of parental self-efficacy, cultural diversity and teacher strategies. *International Journal of Early Childhood, 34*, 45–60.

Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, & Computers*, *36*, 717–731.

Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods 40*, 879–891.

Rhoades, B. L., Greenberg, M. T., Lanza, S. T., & Blair, C. (2011). Demographic and familial predictors of early executive function development: Contribution of a person-centered perspective. *Journal of Experimental Child Psychology*, *108*, 638–662.

Sarsour, K., Sheridan, M., Jutte, D., Nuru-Jeter, A., Hinshaw, S., & Boyce, W. T. (2011). Family socioeconomic status and child executive functions: The roles of language, home environment, and single parenthood. *Journal of the International Neuropsychological Society*, *17*, 120–132.

Sirin, S. R. (2005). Socioeconomic status and academic achievement: a meta-analytic review of research. *Review of Educational Research, 75*, 417–453.

School Readiness Act of 2005, H. R. 2123, 109th Cong. (2005).

Tabachnick, B. G., & Fidell, L. S. (1996). *Using multivariate statistics (3rd ed.)*. New York: Harper Collins.

Villalón, M., & Rolla, A. (2008). Prueba de Alfabetización Inicial (PAI). Chile: Pontificia Universidad Católica de Chile.

Waanders, C., Mendez, J. L., & Downer, J. T. (2007). Parent characteristics, economic stress and neighborhood context as predictors of parent involvement in preschool children's education. *Journal of School Psychology*, *45*, 619–636.

Williams, D. R. (1999). Race, socioeconomic status, and health the added effects of racism and discrimination. *Annals of the New York Academy of Sciences*, *896*, 173–188.

Yagmur, S., Mesman, J., Malda, M., Bakermans-Kranenburg, M.J., & Ekmekci, H. (2014). Video-feedback intervention increases sensitive parenting in ethnic minority mothers: A randomized control trial. *Attachment & Human Development, 16*, 371–386.

Yamada, Y., Stevens, C., Dow, M., Harn, B. A., Chard, D. J., & Neville, H. J. (2011). Emergence of the neural network for reading in five-year-old beginning readers of different levels of pre-literacy abilities: an fMRI study. *Neuroimage*, *57*, 704–713.

Yeniad, N., Malda, M., Mesman, J., Van IJzendoorn, M. H., Pieper, S. (2013). Shifting ability predicts math and reading performance in children: A meta-analytical study. *Learning and Individual Differences, 23,* 1–9

Van Zeijl, J., Mesman, J. Van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., Juffer, F., Stolk, M. N., Koot, H. M. & Alink, L. (2006). Attachment-Based Intervention for Enhancing Sensitive Discipline in Mothers of 1- to 3-Year-Old Children at Risk for Externalizing Behavior Problems: A Randomized Controlled Trial. *Journal of Consulting and Clinical Psychology*, *74,* 994–1005.

Chapter 5

Preschoolers' Problem Behavior, Prosocial Behavior, and Language Ability in Chile: The Roles of Child Executive Functions and Socialization Environments

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De La Harpe, C., and Mesman, J.

Abstract

Child executive functions and socialization environments are crucial for the socioemotional and cognitive development of preschoolers. This study examined the role of socioeconomic status (SES), ethnicity, executive functions (EFs), quality of the home environment, quantity of maternal care, and quality and quantity of professional childcare as predictors of five-year-old preschoolers' problem behavior, prosocial behavior, and language ability in 77 low-SES families from Chilean majority or Mapuche minority background in Chile. Executive functions and the quality of the home environment were positively associated with language ability, whereas quantity of childcare was inversely related to children's language ability. All other associations were non-significant. The results corroborate the vital roles of child executive functioning and stimulating and responsive parenting in child language ability in a Latin-American context. Furthermore, our findings unveiled inadequate preschool classroom quality and provide new evidence from the south of Chile for the urgency to improve the quality of Chilean children's pre-primary education as a catalyst for reducing social disparities.

Keywords: parental caregiving and professional childcare, executive functions, socioemotional adjustment, language ability, preschoolers

Introduction

Children typically reach important developmental milestones by preschool age in the socioemotional and cognitive domains, which contribute to later school achievement and future life success (Smith, 2001). Such developments are determined by the child's biological characteristics, proximal processes (family and childcare) and more distal processes (cultural and economic contexts) (Bronfenbrenner, 2005). At the child level executive functions help children to maintain selective attention, exercise behavioral control, regulate their emotions, and control their cognitive processes (Diamond, 2013). At the socialization level high-quality caregiving in both the home and the preschool environment have been reported to increase children's developmental opportunities (Bradley & Corwyn, 2005; Burchinal & Cryer, 2004). Dosage of caregiving also seems to matter for child outcomes at least for professional childcare (Loeb, Bridges, Bassok, Fuller, & Rumberger, 2007), whereas quantity of maternal care appears to be unrelated (Erel, Oberman, & Yirmiya, 2000; Lucas-Thompson, Goldberg, & Prause, 2010). Furthermore, contextual factors such as the family's socioeconomic and cultural background have been identified as important predictors of child developmental outcomes (Bornstein, 1995; Grantham-McGregor et al., 2007). However, these multiple influences on child development have rarely been investigated in Latin-American countries, whereas there is evidence that associations between specific caregiving dimensions and child development may vary depending on cultural factors (Bradley & Corwyn, 2005; Halgunseth, Ispa, & Rudy, 2006). The current study addresses this research gap by examining the interrelations between SES, ethnicity, child EFs, socialization environments and preschool children's socioemotional adjustment and cognitive development in a bi-ethnic (indigenous Mapuche or Chilean), low-SES sample in the Latin-American context of Chile.

Developmental Milestones at Preschool Age

Children's emotion regulation is one of the important milestones in early development and has important implications for adaptive functioning later in life (Murray & Kochanska, 2002). Deficient emotion regulation manifests in children's behavior problems, such as internalizing or externalizing behavior. Children who internalize are emotionally reactive, withdrawn and are prone

to experience feeling of anxiety and depression. In contrast, children who externalize experience more anger, impulsivity, aggression, and attention problems (Achenbach & Rescorla, 2000). A second milestone in early childhood is the development of prosocial behavior, which allows children to engage in "positive interactions with other people, including helping, sharing, cooperating, and comforting" (Scourfield, John, Martin, & McGuffin, 2004, p. 927). A third developmental milestone during early childhood is the acquisition of language, which is crucial to children's social, emotional, and academic adjustment (Beitchman & Brownlie, 2005; Forget-Dubois, Dionne, Lemelin, Pérusse, Tremblay, & Boivin, 2009). In the literature, predictors of functioning in these three developmental domains during the preschool years include children's executive functioning, the quantity and quality of the caregiving environment at home and childcare, and children's socioeconomic and ethnic background. We discuss each of these predictors below, followed by a reflection on relevant studies in the Chilean context specifically.

Executive Functions and Child Development

EFs are directing thought processes that optimize behavior in changing environments and consist of three main abilities: (1) working memory, (2) inhibitory control (attentional, cognitive, and behavioral inhibition), and (3) cognitive flexibility (Diamond, 2013). EFs are important for favorable child development in several developmental domains. Results of a recent meta-analysis show that impairments of all three EF abilities, but especially of inhibition, are associated with externalizing problem behavior in preschool years (Schoemaker, Mulder, Deković, & Matthys, 2013). Deficits in EFs across the preschool period have also been linked to internalizing problem behavior in first grade (Hughes & Ensor, 2011). In preschoolers, EF abilities have moreover been related to prosocial skills, positive relationships in the classroom, and social competence (Brock, Rimm-Kaufman, Nathanson, & Grimm, 2009; Yeates et al., 2007). Furthermore, EFs have been reported to significantly predict vocabulary, listening comprehension, and emergent literacy (McClelland et al., 2007; Nayfeld, Fuccillo, & Greenfield, 2013), and to be significantly associated with verbal ability in Head Start preschoolers (Fuhs & Day, 2011). The Early Child Care Research Network has found that EFs mediate the link between family environment and language outcomes (NICHD ECCRN, 2003a), suggesting that family processes can help understand the emergence of both EFs and language outcomes.

Home Environment and Child Development

During early childhood children normally spend most of their time at home with their primary caregivers. The richness of children's developmental experiences depends on the physical and psychosocial environment they grow up in (Caldwell & Bradley, 2003). The availability of learning materials and quantity and quality of parental support and stimulation have consistently been found to predict favorable child outcomes in several domains (Bradley, Corwyn, Burchinal, McAdoo, & García Coll, 2001; Isenberg & Quisenberry, 2002). Higher quality of the home environment has been linked to less behavioral problems (NICHD ECCRN, 2003a; Pachter, Auinger, Palmer, & Weitzman, 2006), higher social competence (NICHD ECCRN, 2003a; NICHD ECCRN, 2004), and more favorable language development (Connor, Son, Hindman, & Morrison, 2005; McClelland, Kessenich, & Morrison, 2003; Morrison & Cooney, 2001; NICHD ECCRN, 2004) in children across the first few years of life. Quantity of maternal care can be approximated by maternal employment status. Recent meta-analyses showed that maternal employment during the first years of life is generally not associated with children's behavior problems, social interaction skills, and cognitive outcomes (Erel, Oberman, & Yirmiya, 2000; Lucas-Thompson, Goldberg, Prause, 2010). However, the Canadian National Longitudinal Survey of Children and Youth has found that maternal employment was positively related to child prosocial behavior (Nomaguchi, 2006). This suggests that preschoolers do not suffer from and might even benefit from maternal employment, as it allows them to interact with non-parental adults and peers.

Childcare Environment and Child Development

Eighty-four percent of children in OECD (Organization for Economic Cooperation and Development) countries are enrolled in pre-primary education between 3 and 5 years (OECD Family Database, 2013), indicating that the vast majority of preschool aged children spend a considerable part of their young lives in childcare. Childcare experiences inevitably shape children's development. The physical infrastructure, availability of books, toys and learning materials, the quality of caregiving and social interactions with peers, and the variety of physically, cognitively, linguistically, and artistically stimulating activities offered to the child can help or hinder child development (Harms, Clifford, & Cryer, 1998; NICHD ECCRN, 2005).

The literature on the influence of childcare quality on children's developmental outcomes is inconclusive. Several studies demonstrated that higher childcare quality during the first years of life are related to fewer behavior problems, higher social competence (Burchinal, Vandergrift, Pianta, & Mashburn, 2010; Mashburn et al., 2008; NICHD ECCRN, 2001), and higher expressive and receptive vocabulary (Connor, Son, Hindman, & Morrison, 2005; Howes et al., 2008; Mashburn et al., 2008; NICHD ECCRN, 2004). Other scholars, however, have pointed to evidence showing that the associations between childcare quality indicators and language, social skills, and behavior problems are generally weak (Burchinal, Kainz, & Cai 2011; Weiland, Ulvestad, Sachs, & Yoshikawa, 2013; Zaslow, Martinez-Beck, Tout, & Halle, 2011).

The amount of time young children spend in childcare also seems to matter. A large-scale US study found that the more time children spend in nonmaternal care during early childhood the more problem behaviors they exhibit during preschool (NICHD ECCRN, 2001; NICHD ECCRN, 2003b), elementary school, (Belsky, Vandell, Burchinal, Clarke-Stewart, McCartney, & Owen, 2007) and secondary school (Vandell, Belsky, Burchinal, Steinberg, & Vandergrift, 2010). These results, however, were not replicated in a large-scale Norwegian sample in the context of homogenously high-quality child care (Zachrisson, Dearing, Lekhal, & Toppelberg, 2013). Large-scale US studies also found that more time spent in nonmaternal care during early childhood predicts less social competence at preschool age (Loeb, Bridges, Bassok, Fuller, & Rumberger, 2007; NICHD ECCRN, 2001; NICHD ECCRN, 2003b). The literature on the influence of childcare quantity on children's language learning reveals mixed findings. The Early Child Care Research Network reports no relations between the amount of childcare attendance and language outcomes (NICHD ECCRN, 2000), whereas others find positive relations (Loeb, Bridges, Bassok, Fuller, & Rumberger, 2007; Luijk et al., 2015). There are moreover indications that this influence is modulated by family SES. It appears that spending more time in childcare shows more favorable outcomes for disadvantaged children than for more economically advantaged children as the compensatory hypothesis suggests (McClelland, Kessenich & Morrison, 2003; Sameroff & Chandler, 1975).

Socioeconomic Status, Ethnicity, and Child Development

The cultural context in Bronfenbrenner's (2005) bioecological model includes SES and ethnicity as distal processes affecting child development in the social, emotional and cognitive domains. SES refers to an individual's social class and is commonly estimated based on household income, material resources, education, and occupation. Social class drastically determines children's developmental opportunities, school achievement, and success in life (Evans, 2004). Low-SES children are vulnerable to the accumulation of several risk conditions which become an impediment for reaching their potential across different developmental domains (Grantham-McGregor et al., 2007). Hence, low-SES children consistently demonstrate more problem behaviors, weaker social competences, and less language ability compared to their more affluent peers (Berger, Paxson, & Waldfogel, 2009; Engle & Black, 2008; Huaqing Qi & Kaiser, 2003). Both genetic factors (Bartels, Rietveld, Van Baal, & Boomsma, 2002) and environmental factors (Evans, 2004) partially explain these developmental differences.

The relations between caregiving processes and child outcomes in early childhood may also differ as a function of culture and ethnicity, because they determine a common identity and heritage of group members (Bornstein, 1995; Quintana et al., 2006). Children are embedded in their unique sociocultural environment with their own set of traditional values and beliefs, which translate into daily routines, childcare customs and parenting practices (Super & Harkness, 2002). Furthermore ethnic minority group members often experience racism, individual or institutional discrimination, marginalization, the stigma of inferiority, and restricted socioeconomic opportunities and mobility (Williams, 1999). Indigenous ethnic minority groups are known to experience yet additional stressors such as loss of lands, culture, language and identity, and adjustment to the dominant culture and life-style (King, Smith, & Gracey, 2009). Bearing these points in mind it is important to examine whether culture specific family and childcare processes are operating in relation to children's socioemotional adjustment and cognitive abilities. We are the first to examine these developmental processes in a bi-ethnic at-risk population consisting of indigenous Mapuche minority and Chilean majority families in the south of Chile.

Research in the Chilean Context

Few studies have examined predictors of child development during the preschool years in Chile, and many linkages discussed above have not been studied in the Chilean context at all. Here we will discuss the small number of relevant findings based on Chilean samples. One study found that EFs did not predict early literacy and language development in Chilean preschoolers (Barata, 2011). Two studies reported positive associations between the quality of the home environment and Chilean preschooler's language development (Coddington, Mistry, & Bailey, 2014; Lohndorf, Vermeer, Cárcamo, & Mesman, 2017). Another study demonstrated that Chilean children were exposed to less literacy experiences than children in developed countries, at home and at school (Strasser & Lissi, 2009). Data from the large scale nationally representative sample of the Longitudinal Survey of Early Childhood in Chile (ELPI –Encuesta Longitudinal de la Primera Infancia) revealed that maternal employment during the first year after birth had no impact on the child's cognitive development, whereas employment in the second year was associated with an increase in receptive vocabulary during preschool age (Contreras & Thiveos, n.d.).

The quality of childcare showed a negative relation with problem behaviors and a positive relation with social development, language ability and early writing in Chilean preschoolers (Herrera, Mathiesen, Merino, & Recart, 2005; Leyva et al 2015). Evidence concerning quantity of childcare is mixed in Chile. One large scale longitudinal study reports that children spending more hours in childcare during their third year of life exhibited more behavior problems (Narea, 2014), whereas a second study found significant positive effects in the area of emotional regulation (Noboa-Hidalgo & Urzua, 2012). A third study found no significant relation (Urzúa & Veramendi, 2011). Moreover, one Chilean study reported that childcare attendance was related to negative social competence outcomes (Noboa-Hidalgo & Urzua, 2012). Furthermore, some studies find positive relations between the amount of childcare attendance and language outcomes (Córtazar, 2012; Narea, 2014; Noboa-Hidalgo & Urzua, 2012); in contrast others report no relations (Bucarey, Ugarte, & Urzúa, 2014; Contreras & González, 2015; Urzú, & Veramendi, 2011). Findings about the impact of social disparities on child development in Chile indicate that SES-related developmental differences emerge during early childhood, and that there is a considerable association between family income, maternal education,

cognitive and non-cognitive development, and the health of children (Contreras & González, 2015).

The Current Study

To fill the gaps in research addressing predictors of preschool children's developmental milestones in the Latin American context, we examined how SES, ethnicity, child EFs, quality and quantity of caregiving environment, both at home and childcare, relate to individual differences in Chilean preschool children's socioemotional adjustment and language ability. We test the following hypotheses (based on Chilean findings where possible, otherwise based on Western research outcomes):

1) We hypothesize that higher SES, ethnic majority status, higher levels of EFs, higher quality socialization environments (home and preschool), higher quantity of maternal care, and lower quantity of childcare predict less problem behavior and more prosocial behavior.
2) We expect that higher SES, ethnic majority status, higher levels of executive functioning, and higher quality socialization environments (home and preschool), less quantity of maternal care, and more quantity of childcare predict more favorable language ability.

Method

Family Sample and Procedure

The current study is a follow-up of the longitudinal Magellan-Leiden Childcare Study, which started in February 2012 with 110 mothers and their 6 months old infants (Cárcamo, Vermeer, Van der Veer, & Van IJzendoorn, 2015). The initial sample was drawn from three public health centers and records of 19 public daycare centers in the Araucanía region and on Chiloé Island (Lake region) in the south of Chile. Attrition reduced the number of children in the final longitudinal sample. From the initial 110 mother-child-dyads, 95 (86%) participated at Time 2 (mean child age 15 months), 79 (72%) at Time 3 (mean child age 42 months), and 80 (71%) at Time 4 (mean child age 61 months). Reasons for non-participation were that families moved residence and did not leave any contact address or telephone number, they moved out of the study

area or they had no time (e.g. due to the birth of another baby). In the current study we report on Time 4 data (collected from August to October 2016) unless otherwise stated. Three dyads of the remaining 80 were excluded from analysis due to missing variables (two mothers did not fill in questionnaires and one child did not collaborate during the language tests), resulting in a final current sample of 77 mother-child-dyads.

We compared the dropouts with the remaining sample. An independent t-test indicated that there was a significant difference between the drop outs [n = 33; M = 21.61; SD = 4.66] and the current participants [n = 77; M = 27.00; SD = 7.60] in terms of maternal age [$t(108) = -3.79$, $p < .00$]. This was partly due to the tendency of mothers in their late teens or early twenties to be unavailable for participation at Time 4. A Chi-square test revealed that the drop-out mothers significantly differed from the current sample on SES [$\chi^2(1, N = 110) = 23.64$, $p < .001$]. Almost all of the 33 families (97%) that discontinued their participation were from the lowest SES backgrounds. No differences emerged between the drop-outs and the current sample on child gender [$\chi^2(1, N = 110) = 2.69$, $p = .10$], ethnicity [$\chi^2(1, N = 110) = 0.47$, $p = .49$] and marital status [$\chi^2(1, N = 110) = 1.82$, $p = .18$].

The Time 4 participants are from lower class ethnic majority Chilean (n = 46) and ethnic minority indigenous Mapuche (n = 31) background. Mean household income per capita was 2.34 (SD = 1.15) on a 5 point scale according to national quintile distribution (for details about SES assessment see 'socioeconomic status' in the measures subsection). Mothers' educational level was distributed as follows (M = 2.38; SD = 0.95, on a 4 point scale): 16.9 % either only completed primary school or did not complete secondary school, 44.2 % completed secondary school, 23.4 % completed vocational school, and 15.6% completed university studies. It is important to note that our sample is below the mean national monthly per capita income and in terms of education our participating mothers are at the average level (the average educational level in Chile, however, is very low: 71% of the Chilean adult population has no post-secondary education, CASEN, 2013a) compared to a large nationally representative sample (Cárcamo et al., 2015). This is consistent with the characterization of our current sample as 'low-SES'. All primary caregivers were mothers; their mean age was 31 years and mean child age was 61 months. Forty-two percent of the children were raised by a single parent and 62 % were boys. Characteristics of mothers and children are displayed in Table 1.

Ethical approval was obtained by the Ethical Committee Board of Leiden University (The Netherlands). Time 4 data were collected by six trained female undergraduate psychology students of the Catholic University Temuco, Chile. Participating dyads received two home visits between August and October 2016. Each home visit took approximately 90 minutes and during the respective first visit the primary caregiver was informed about the subsequent data collection

Table 1
Descriptive statistics of child outcomes, EFs, parental caregiving, professional childcare, and family characteristics (N=77)

		M	SD	Min	Max
Child development					
Problem behavior (61 mos.)		0.43	0.19	0.40	0.86
Prosocial behavior (61 mos.)		2.63	0.45	1.49	3.72
Language ability (61 mos.)		---	1.79	-3.79	4.34
Executive functioning					
Task switching (61 mos.)		44.16	30.57	0.00	100.00
Parental caregiving					
Quality of home environment (average 6-61 mos.)		74.43	6.85	56.70	88.72
Quantity of maternal care (61 mos.)		72.87	35.34	24.00	168.00
Childcare					
Quality of preschool (transition levels)		2.51	0.78	1.31	4.80
Quantity of childcare (average 6-61 mos.)		47.79	24.02	5.12	92.75
Family characteristics (61 mos.)					
Maternal age (years)		31.30	7.60	21.00	49.00
Child age (months)		60.82	1.36	58.00	63.00
Maternal education		2.38	0.95	1.00	4.00
Per capita income		2.34	1.15	1.00	5.00
SES [a]		---	1.68	-2.62	4.04
		N	%		
Ethnicity	Mapuche	31	40.30		
	Chilean	46	59.70		
Child gender	Male	48	62.30		
	Female	29	37.70		
Parents	One parent	32	41.60		
	Two parents	45	58.40		

[a] sum of z-score values with a mean of 0

and invited to continue participating, after which the informed consent form was signed. During the home visits the quality of the home environment was assessed and mothers filled out questionnaires about demographic information (parental education, employment, income, family and household composition), the child's health and childcare situation (home versus daycare), and the child's prosocial and problem behavior. Furthermore, the children's language and executive function abilities were tested. Tests were administered to all children according to a standardized sequential order and all testing was either audio or video recorded to be able to decide on scoring afterwards in case of ambiguous answers. The participants received a 10,000 CLP (US$ 15) voucher of a local supermarket or convenient store as remuneration for their collaboration.

Preschool Sample and Procedure

The 77 participating children of our longitudinal study were enrolled in 48 preschools (21 public, 26 private-subsidized, and 1 private) in the Araucanía and Lake region in the south of Chile. In Chile 37.5% of schools are public, 48% are government dependent private schools, and 14.5% are independent private schools (OECD, 2014). Our preschool sample appears to be fairly representative compared to the national distribution of school type (only private school were underrepresented). Of the 48 visited preschools 11 preschools had more than one class attended by at least one participating child (9 preschools had 2 classes and 2 preschools had 3 classes). This results in 61 observed classes, of which 14 classes were attended by more than one participating child (12 classes had 2 children and 2 classes had 3 children). Eighty-seven percent of the children attended the preschool transition level one (regular age 4-5) and 13% of the children attended the preschool transition level two (regular age 5-6), depending on the children's date of birth. The children had on average 2 teachers and 18 of their classmates were present during the observation.

The preschool data were collected by the first and fourth author and three male psychology students of the Catholic University Temuco, Chile (for details about training see Measures section). Each preschool was visited once for about 3½ hours between August and October 2016. During the preschool visit the participating child's classroom was observed and his/her teacher interviewed to measure the process quality of the child's childcare experience. The majority of the classroom observations occurred during the morning, only in case that the children exclusively attended an afternoon program was the

observation realized in the afternoon. Prior to the visits, the preschool directors were contacted by phone, e-mail or personally by a research assistant and the first author to request authorization for the classroom observations. They were also provided with written information about the classroom observation and the purpose of the study before they (or the classroom teachers) signed the informed consent form. The participating child's parents were informed by a research assistant and the non-participating children's parents were informed about the classroom observation by their teacher. The teachers received two didactic games worth 12,000 CLP (US$ 20) for their classrooms as remuneration for their collaboration.

Measures

Problem behavior. The Child Behavior Checklist 1½-5 (CBCL) was used to obtain standardized maternal reports of children's externalizing and internalizing problem behaviors (Achenbach & Rescorla, 2000). The 99 items describe a wide array of behavioral problems, subdivided into eight subscales: emotionally reactive, anxious/depressed, somatic complaints, withdrawn, sleep problems, attention problems, aggressive behavior, and other problems. The CBCL has been administered in many countries around the world including Chile and its validity and reliability has been well established (Crijnen, Achenbach, & Verhulst, 1997; Lecannelier et al., 2014). The mother was asked to rate the occurrence of her child's problems in the preceding 2 months on a 3-point scale: 0 = not true (as far as you know), 1 = somewhat or sometimes true, and 2 = very true or often true. For the purpose of this study only the 24 externalizing items and the 25 internalizing items were combined into a global indicator of child problem behaviors (mean score), because they correlated highly (r = .53). In the current study internal consistency yielded a Cronbach's alpha of .88.

Prosocial behavior. We used the Child Conscience Measure (CCM) to assess children's prosocial behavior (Kochanska, DeVet, Goldman, Murray, & Putnam, 1994). The CCM originally consists of 100 items and ten subscales, of which only three were included in our study: guilt/remorse (18 items), concern over good feeling with parent after wrongdoing (8 items), empathic/prosocial response to another's distress (13 items). The CCM has shown good psychometric properties (Kochanska et al., 1994). Mothers were asked to

indicate to which degree the 39 presented statements were false (0), a little false (1), neither true nor false (2), a little true (3) or true (4) about her child. The items of the three subscales were combined into a global indicator of prosocial behavior (mean score). Higher scores indicate higher prosocial behavior. In the current study internal consistency yielded a Cronbach's alpha of .80).

Language ability. Receptive vocabulary was assessed using the Spanish adaptation of the Peabody Picture Vocabulary Test (PPVT) called Test de Vocabulario en Imágenes Peabody (TVIP), because all participating children speak Spanish as their first language (Dunn, Padilla, Lugo, & Dunn, 1986). During test administration (15-20 min) the child is shown one of the 125 black and white test plates at a time and after the research assistant names one of the four objects on the test plate the child has to point to the correct picture. Just as the PPVT, the TVIP has proven to be a reliable and valid instrument for receptive vocabulary assessment over the years (ACYF, 2003; Piñeiro et al., 2000). In the current study the split-half (odd/even) sample reliability was .95. The test was administered based on basal and ceiling rules (base item = 8 consecutive correct answers; ceiling item = 8 consecutive responses containing 6 errors). The final score is the number of correct responses between base and ceiling items. There were five missing scores due to child test refusal or experimenter error. Each child's missing score was estimated based on the particular child's percentile score on the Expressive One Word Picture Vocabulary Test. The Expressive One Word Picture Vocabulary Test – Spanish Bilingual Edition (EOWPVT-4-SBE) measures children's ability to generate words (Nancy, 2013). The child is shown one of the 180 color pictures at a time and after a prompting question by the research assistant has to generate the word that best describes the object, concept, or action. Test administration time is 15-20 minutes. A Cronbach's alpha of .95 indicates high internal consistency of the EOWPVT-4-SBE for Hispanic children aged three and four in the US (Nancy, 2013). In the current study the split-half (odd/even) sample reliability was .93. The test was administered based on basal and ceiling rules (base item = 8 consecutive correct answers; ceiling item = 6 consecutive incorrect responses). The final score is the number of correct responses between base and ceiling items. Receptive and expressive vocabulary were significantly correlated (r = .60), therefore they were combined into one global indicator of language ability by summing the standardized scores of both measures. One early suspension

score (experimenter error) was replaced by an estimate based on the same child's percentile score on the TVIP.

Executive functions. The Dimensional Change Card Sorting (DCCS) task was chosen because it is an excellent global indicator of EF abilities (Diamond, Carlson, & Beck, 2005; Kirkham, Cruess, & Diamond, 2003). The DCCS like all task-switching paradigms requires children to resist the dominant response (inhibitory control), to flexibly adapt to changing situations (cognitive flexibility), and to keep rules in mind to some extent (working memory) (Diamond, Carlson, & Beck, 2005). The DCCS was administered by research assistants after an extensive training period (studying the instructions, watching a training video provided by Diamond, practice sessions, and a pilot home visit with non-participating children). In this task, after sorting cards according to a certain dimension (e.g., color), the child is required to begin sorting by a different dimension (e.g., shape), followed by a mixed trial in which shape and color are offered in a pseudo random order. Test administration takes 10-15 minutes and the sorting cards match the model cards on two dimensions, consequently the child had to inhibit sorting by the other dimension. The final scores are based on the mixed sorting game only, as it assesses children's task switching ability. For every correct switch (from color to shape or vice versa) of eleven total switch trials one point was given. The total scores were transformed into percentage scores, whereby higher scores indicate more correct switches.

Quantity and quality of home environment. Mothers reported how many hours they spend with their child per day on a typical work day and on the weekends. These time indications were summed, resulting in the total amount of hours the mother spends with her child per week. Six mother reports were incomplete and hence replaced with the group mean. The quality of the home environment was assessed with the Infant/Toddler Home Observation for Measurement of the Environment (IT-HOME; Caldwell & Bradley, 2003) at Time 1 and Time 2 when children were 6 and 15 months old respectively (for details see Cárcamo et al., 2015). The Early Childhood Home Observation for Measurement of the Environment (EC-HOME; Caldwell & Bradley, 2003) was used at Time 3 and Time 4 when children were 3½ and 5 years old. The IT-HOME and EC-HOME are both comprised of two parts: an observation of the home environment followed by a semi-structured interview with the primary

caregiver of approximately 30 min each. The IT-Home consists of 45 binary choice items (negative = 0, positive = 1) grouped in six subscales (responsivity, acceptance, organization, learning materials, involvement, variety) and the EC-Home consists of 55 binary choice items grouped in eight subscales (learning materials, language stimulation, physical environment, responsivity, academic stimulation, modelling, variety, and acceptance). The scores are summed and provide an indicator of the quality of the home environment (higher scores = higher quality). The HOME inventory has been administered in many countries around the world including Chile and its validity for minority and low-SES groups has been well established (Bradley, Corwyn, McAdoo, & Garcia Coll, 2001; Bustos, Correa, Herrera, & Mathiesen, 2001). The HOME assessments were performed by the research assistants after an extensive training period (studying the manual, discussing items, video-scoring, and a pilot home visit). At Time 1 and 2 the inter-rater reliability was established to a criterion of 80 % agreement with expert criteria scores and the internal consistency was .58 (Cronbach's alpha). At Time 3 and 4 observers achieved an average agreement of 94 % with expert scoring when interrater reliability was assessed and the internal consistency of the instrument yielded a Cronbach's alpha of .69 and .82 for Time 3 and Time 4 respectively. An accumulated HOME score was computed indicating the overall quality of the home environment across all four time points by calculating mean percentage scores across the four measurements (note: there were 6 missing data due to non-participation at Time 3 and 2 missing data due to non-completion at Time 4). All four HOME measurements were significantly correlated; Pearson correlations ranged from .28 to .59.

Quantity and quality of professional childcare. Directors of the childcare centers in the Araucanía region and on Chiloé Island and collaborating JUNJI (National Council of Daycare Centers) and INTEGRA (National Network of Nursery Schools and Kindergartens) staff were contacted in order to obtain the children's childcare attendance from 2012 to 2015. They were asked to report how many days per monthly working days the participating children attended childcare. The researchers and psychology students visiting the preschools for the classroom observations at Time 4 had access to the children's class register and copied their monthly attendance of the first semester 2016 (January to July). All collected data were transformed into a total percentage score of each

child's childcare attendance between 6 and 61 months, termed 'quantity of childcare'. This included nursery schools (6-24 months), kindergarten middle levels (24-48 months), preschool transition level one (48- 60 months) and in some cases preschool transition level two (61-72 months). We had incomplete data of three children (e.g. one semester missing), which were replaced by the child's average attendance of the same childcare level (nursery, kindergarten or preschool).

The Spanish version of the Early Childhood Environment Rating Scale-Revised (ECERS-R; Harms, Clifford, & Cryer, 1998; Harms, Clifford, & Cryer, 2002) was used to measure process quality, which refers to the actual experiences of children in preschool. The rating scale is intended for children between 2.5 and 5 years of age has shown good reliability and validity internationally (Clifford, Reszka, & Rossbach, 2010; Peisner- Feinberg & Burchinal, 1997). The ECERS-R includes a 3 hour classroom observation period, followed by an interview with the classroom teacher (20-30 min). The ECERS consists of 43 items organized in seven subscales: space and furnishings; personal care routines, language-reasoning, activities, interaction, program structure, and parents and staff. Two items were deleted due to non-applicability (11 'nap/ rest' and 37 'provisions for children with disabilities') and one sub-scale (38-43 'parents and staff') was excluded due to irrelevance to the questions under study. Consequently, the following results are based on 35 of the 43 original items. All ECERS-R items are presented on a 7-point Likert-type scale ranging from *one* (inadequate), *three* (minimal), *five* (good), and *seven* (excellent). 'Inadequate' indicates childcare that does not meet basic custodial care needs. 'Minimal' describes childcare that meets custodial needs and, to a lesser degree, basic developmental needs. 'Good' means that children's developmental needs are met. 'Excellent' indicates high-quality personalized care. A mean score for the quality of preschools was calculated including the 35 utilized items. Internal consistency of the instrument yielded a Cronbach's alpha of .90.

An expert trainer (HV, second author) instructed the first author (RL) on the ECERS-R (93% agreement within one scale point) and the third and fourth author (CDH, RC) on the ITERS-R, the Infant/Toddler Environment Rating Scale-Revised (90% agreement within one scale point). After self-training on the ECERS-R, the third and fourth author trained three psychology students of the Catholic University of Temuco (Chile). Inter-rater reliability was established to a criterion of 80 % agreement within one scale point. The

mean percentage of agreement across two consecutive observations and one 'refresher' observation a few weeks later just before the start of data collection was 86 % (range 80-92 %) for the students. Furthermore, we controlled for observer drift after about half (45%) of the classroom observations and the mean percentage of agreement across observations was 90% (range 82-94%).

SES and ethnicity. SES and ethnicity will be included as covariates in the main analyses of the current study. SES was determined based on maternal education and per capita income. The level of maternal education was self-reported in a questionnaire at time 4 on a 1-4 point scale (1 = incomplete primary or secondary school; 2 = secondary school completed; 3 = vocational education; 4 = university studies). Eleven mothers did not report their educational level. In these cases the missing data was replaced with maternal educational level at Time 3 as best estimate. At Time 4, mothers also indicated their total gross monthly household income in Chilean Pesos (CLP) divided by the number of household members. This resulted in five income per capita answer categories: less than 74,969 Chilean Pesos (US$ 112) (1), between 74,970 and 125,558 CLP (US$ 187) (2), between 125,559 and 193,104 CLP (US$ 288) (3), between 193,105 and 352,743 CLP (US$ 527) (4) and more than 352,744 CLP (5). The socioeconomic categorization is based on the five quintiles of the Chilean Ministry of Social Development (CASEN, 2013b). Nine mothers did not report their income; in these cases the missing information was replaced with the Time 3 income measure as best estimate. The maternal education level and per capita income level were combined into one global indicator of SES by summing the standardized scores of both measures. The ethnicity of the participating mother-child-dyads was determined by self-report (Cárcamo et al., 2015). Dyads were defined as Mapuche, when mothers stated that their children grow up in a Mapuche family.

Data Analysis Plan

Child outcome measures, executive functioning, parenting and childcare measures, and SES were inspected for outliers defined as values with SD greater than 3.29 above the mean (Tabachnick & Fidell, 1996). No outliers were found and all variables were normally distributed. Pearson correlation coefficients were computed to inspect the bivariate associations between all variables.

Hierarchical multiple regression analyses (HMR) were conducted to test whether child problem behavior, prosocial behavior, and language ability at 61 months varied as a function of child executive functioning, parental caregiving and professional childcare. The models included the following predictor variables: SES at 61 months, ethnicity (0 = Chilean, 1 = Mapuche), executive functioning at 61 months (percentage of correct switch trials), average quality of home environment from 6 to 61 months (percentage score), quantity of maternal care at 61 months (total amount of hours per week), quality of preschool at 61 months (mean score), and average quantity of childcare between 6 and 61 months (percentage score).

We performed multilevel (random intercept) analyses to corroborate the HMR results. Multilevel models are particularly appropriate for nested data, meaning that data for participants is organized at several levels. In our case the units of analysis are the preschoolers at a lower level, who are nested within contextual units (classrooms/ preschools) at higher levels.

Results

Pearson correlations were calculated for all variables (see Table 2). Child executive functioning, quality of home environment, and SES were each significantly positively associated with language ability. SES was moreover correlated with the quality of the home environment and the quantity of maternal care, whereby lower SES mothers provided lower quality homes and more maternal care than their higher SES counterparts. Moreover, quantity of childcare was positively associated with child executive functioning and negatively associated with the quantity of maternal care. All other correlations were non-significant.

The average classroom quality of the preschools was inadequate (see Table 1). Three quarters of the classrooms demonstrated inadequate quality (mean score < 3), one quarter of minimal quality (3 ≤ mean score < 5), and none of good quality (mean score ≥ 5). Subscale analysis revealed the following: space and furnishings (M = 2.5); personal care routines (M = 2.7), language-reasoning (M = 3.1), activities (M = 2.1), interaction (M = 3.0), program structure (M = 2.2). Only 'language and reasoning' and 'interaction' just made it into the minimal quality category, all other subscales fell into the inadequate category.

Table 2

Pearson correlations between demographics, EFs, parental caregiving, professional childcare, and child outcomes (N=77)

		1	2	3	4	5	6	7	8	9	10
1	SES (61 mos.)	–									
2	Ethnicity [a]	.11	–								
3	Child executive functioning (61 mos.)	.19	-.10	–							
4	Quality of home environment (average 6-61 mos.)	.52**	-.03	.11	–						
5	Quantity of maternal care (61 mos.)	-.28*	-.04	-.08	.17	–					
6	Quality of preschool (transition levels)	.06	-.02	.01	-.05	-.02	–				
7	Quantity of childcare (average 6-61 mos.)	.10	-.03	.25*	.13	-.29*	-.02	–			
8	Problem behavior (61 mos.)	-.15	-.15	-.10	-.13	-.02	-.04	.01	–		
9	Prosocial behavior (61 mos.)	.03	-.10	.21	.04	.09	-.10	.09	.01	–	
10	Language ability (61 mos.)	.37**	-.15	.34**	.43**	.04	-.02	-.08	-.03	.16	–

[a] 0 = Chilean majority, 1 = Mapuche minority

* $p < 0.05$, ** $p<0.01$

As some of the observed children came from the same childcare setting, we had to deal with a hierarchical data structure. The 77 children came from 61 classes within 48 schools. However, the number of classes per school and the number of children per class was small (never larger than 3). In addition, because only one participating child was enrolled in 47 out of 61 observed classes, the within- and between-setting variance partly overlapped. Therefore, we performed multiple linear regression analyses to examine multivariate relations between predictors and outcomes as a starting point, and corroborated the results using a multilevel (random intercept) model. As expected, multilevel outcomes were similar to the outcomes of the multiple regression analyses and led to the same conclusions. Thus, we only report multiple linear regression analyses results.

Three two-stage hierarchical multiple regression analyses were conducted with child problem behavior, prosocial behavior, and language ability as respective outcome variables. SES and ethnicity were entered at stage one of the regression to control for demographic background variables. Child executive functioning, quality of home environment, quantity of maternal care, quality of preschool, and quantity of childcare were entered at stage two into each model. Problem behavior (Model 1) and prosocial behavior (Model 2) were not significantly predicted by the demographic background variables [$F(2,74) = 1.60$, $p = .21$; $F(2,74) = 0.49$, $p = .61$], or by any of the child and the caregiving variables [$F(7,69) = 0.63$, $p = .73$;. $F(7,69) = 0.85$, $p = .55$]. Analyses conducted separately for externalizing and internalizing problem behavior also failed to yield significant predictors in the regression. Language ability (Model 3) was significantly predicted by SES and ethnicity at stage 1 [$F(2,74) = 7.60$, $p = .00$], explaining 17% of the variance. At stage two executive functioning, quality of the home environment, and quantity of childcare significantly predicted language ability [$F(7,69) = 5.22$, $p = .00$] above and beyond SES and ethnicity. At this stage, executive functioning and quality of the home environment showed a positive association with language ability, whereas quantity of childcare showed a negative association with language ability. Together these predictors accounted for 35% of the variance in language ability. Table 3 shows the results of the hierarchical multiple regression analyses.

Table 3

Hierarchical regression analyses predicting problem behavior, prosocial behavior, and language ability from EFs, parental caregiving, and professional childcare (N=77)

	Model 1		Model 2		Model 3	
	Problem behavior [a]		Prosocial behavior [b]		Language ability [c]	
	R^2 = .04	R^2 = .06	R^2 = .01	R^2 = .08	R^2 = .17	R^2 = .35
	p = .21	p = .73	p = .61	p = .55	p = .00	p = .00
Predictors	β	β	β	β	β	β
SES (61 mos.)	-.14	-.09	.05	.09	.39**	.17
Ethnicity	-.14	-.16	-.11	-.09	-.19	-.13
Executive functioning (61 mos.)		-.10		.18		.31**
Quality of home environment (average 6-61mos.)		-.08		-.08		.33*
Quantity of maternal care (61 mos.)		-.04		.16		-.01
Quality of preschool (transition levels)		-.04		-.11		-.02
Quantity of childcare (average 6-61mos.)		.03		.08		-.22*

[a] CBCL = Child Behavior Checklist (subscales internalizing and externalizing) (Achenbach, Rescorla, 2000)

[b] CCM = Child Conscience Measure (subscales: empathy, feelings of guilt, restoring good feelings with parents) (Kochanska, DeVet, Goldman, Murray, & Putnam, 1994)

[c] Test de Vocabulario en Imágenes = Spanish version of Peabody Picture Vocabulary Test (Dunn, L.M., Padilla, E.R., Lugo, D.E., Dunn, L.M., 1986)

[c] Expressive One-Word Picture Vocabulary Test – four – Spanish Bilingual Edition (Nancy, M., 2013)

* p < .05, ** p< .01

Discussion

Our findings provide insight in whether child EFs and socialization environments affect socioemotional adjustment and language ability in Chilean preschool children. We found that executive functions and the quality of the home environment were positively associated with language ability and that quantity of childcare negatively predicted language ability.

The outcome that EFs were associated with language ability remained above and beyond the effects of SES and ethnicity and is in line with our expectations and earlier work in the US (McClelland et al., 2007; Weiland, Barata, & Yoshikawa, 2014), but diverges from the first study in a Chilean context (Barata, 2011). Consistently, preschoolers in our sample with higher levels of executive functioning also showed higher levels of language ability. It has been suggested EFs could help children to improve their language ability, as they need to stay focused and hold information in mind in order to process language (Diamond, 2013). EFs (working memory and inhibitory control) have frequently been reported to be linked to lexical learning and literacy acquisition (Baddeley, 2003; Gathercole, Pickering, Knight, Stegmann, 2004; Yoshida, Tran, Benitez, & Kuwabara, 2011). However, it is also conceivable that the pathways might be reversed: a larger vocabulary size might help children to better plan and control their behavior through self-talk (Fuhs & Day, 2011). We confirm the importance of EFs for developing language ability in a bi-ethnic and low-SES sample.

Furthermore, as expected children growing up in higher-quality home environments (e.g. with more learning materials and language stimulation) across early childhood demonstrated more language ability at preschool. This effect remained above and beyond the effects of SES and ethnicity and is in agreement with prior Western (Connor, Son, Hindman, & Morrison, 2005; NICHD ECCRN, 2004) and Chilean research (Lohndorf et al., 2017). Quantity of maternal care did not predict any language outcomes, which is consistent with findings from Western samples (Lucas-Thompson, Goldberg, Prause, 2010), but inconsistent with findings from a large scale nationally representative sample of the Longitudinal Survey of Early Childhood (ELPI –Encuesta Longitudinal de la Primera Infancia) in Chile (Contreras & Thiveos, n.d.). The ELPI study findings showed that maternal employment during the child's second year is associated with significant language gains

(receptive vocabulary) in preschool. Our results documented that quantity of maternal care during preschool was not associated with preschoolers' language ability (receptive and expressive vocabulary). The contradicting findings can possibly be explained by three differences between the studies: (1) maternal employment is a less exact indicator of maternal care than quantity of maternal care, (2) the inclusion of only receptive vocabulary in ELPI versus the use of receptive and expressive vocabulary in our study, and (3) assessments from the first year onwards in ELPI versus assessments only during the preschool period in our study. In light of Chile generally being a lower income country (nota bene: Chile is officially a high income country due to the gross national income per capita being heavily skewed by Chile's financial oligarchy), where two thirds of the population have less than US$ 389 income per capita per month (AIM, 2015), we would have expected Chilean children to benefit from spending more time in childcare as opposed to in their lower quality homes. Yet, the effect of quantity of childcare depends largely on the quality of childcare and in our sample the quality of preschools appears insufficient to make a difference.

Unexpectedly, the quality of preschool environment did not predict any of the child developmental outcomes. Inspection of the score distribution showed that there may have been range restriction (range 1.3 to 4.8 on an 7-point scale), with a low mean score (2.5), whereby three quarters of the preschools demonstrated inadequate classroom quality, one quarter minimal quality, and none good quality. Apparently, variations within the lowest range of preschool quality do not relate to meaningful differences in child developmental outcomes. Also childcare quality was measured at the group level and not at the individual level, so that it is possible that the childcare an individual child receives differs from the childcare his/her peers receive. The quantity of childcare was negatively associated with language ability. This result conflicts with prior Western and Chilean research, which either found no relations (Contreras & González, 2015; NICHD ECCRN, 2000) or positive relations (Córtazar, 2012; Luijk et al., 2005). Contrary to our expectations which were aligned with the compensatory hypothesis, children spending more time in childcare across early childhood showed less language ability. The opposite would be expected considering our low-SES sample, but only if childcare quality is adequate. The low quality of preschool environments in our sample may not be sufficient to counterbalance economic inequity and low quality home environments. Also Strasser & Lissi (2009) reported

that kindergarten teachers in Santiago de Chile dedicated very little time to language or literacy instruction, most of the time was spend on activities such as recess, snacks, going to the bathroom, and disciplining the children. In terms of language learning, adult-child ratios naturally are more favorable in a family than in childcare, but good quality preschool teachers compensate for this disadvantage by encouraging children to communicate during group time and free play. Our data shows that there was inadequate language stimulation by the teachers, scarce interaction among children, and insufficient free play. In other words children lack vital opportunities to practice their language abilities with teachers and classmates.

Other than hypothesized none of the predictors were associated with children's problem behavior or prosocial behavior. In line with the literature we would have expected higher EFs, higher quality of home and childcare environment, more quantity of maternal care and less quantity of childcare to predict less problem behavior and more prosocial behavior (Brock, Rimm-Kaufman, Nathanson, & Grimm, 2009; Burchinal, Vandergrift, Pianta, & Mashburn, 2010; Erel, Oberman, & Yirmiya, 2000; Lucas-Thompson, Goldberg, Prause, 2010; NICHD ECCRN, 2003a; NICHD ECCRN, 2003b; Schoemaker, Mulder, Deković, & Matthys, 2013). A possible explanation for these unexpected findings may lie in the use of parent report measures to assess problem behavior and prosocial behavior. Mothers could either over-report behavior due to their own emotional impairment or under-report due to lack of awareness (Najman et al., 2001). We suspect that the latter might have been the case in our low-SES sample, especially since most of our participating preschoolers spent a considerable part of the day in childcare and mothers work or study. Child behaviors could pass unnoticed as the mother and child dyads spent relatively few time together. Inspection of score distribution of child problem behavior showed that 92% of our participating children exhibited no problem behavior (< 93rd percentile), 1% of the children fell in the borderline clinical range (93rd to 97th percentile), and 7% were in the clinical range (> 97th percentile). Participating children demonstrated few behavior problems as could be expected in a non-clinical sample, lack of variation might be responsible for the results. Our findings are inconsistent with a prior Chilean study reporting very high scores of problem behavior in preschool children aged 1 ½ to 5 (Rescorla et al., 2011). A possible explanation for these diverging results could be differences in sampling and child age. We

were unable to find norms or reference studies for children's prosocial behavior in a Latin-American context (outcomes appeared to show sufficient variability across the less prosocial to very prosocial spectrum).

SES and ethnicity did not predict child problem behavior or prosocial behavior. SES predicted language behavior, but EFs, quality of the home environment, and quantity of childcare overrode the effect of SES. This is a promising result in a low-SES sample, as it indicates that even marginal increases in SES favorably affect child language and that child EFs, the child's home environment, and childcare attendance possibly offer pathways for intervention. Our prior work suggested that the quality of the home environment mediated the relation between SES and child language (Lohndorf et al., 2017). The absence of ethnic differences in child outcomes seems consistent with prior findings indicating that the majority of the Mapuche are largely indistinguishable from their Chilean counterparts of the same social class due urbanization and acculturation to the dominant culture (Caniguan, 2012).

Strong points of the study include the so far underresearched populations of both indigenous Mapuche ethnic minority and Chilean ethnic majority families in the south of Chile, in combination with the longitudinal design and the use of self-report, task performance, interview, and observational measures obtained during home visits providing ecological validity (Fabes, Martin, Hanish, & Updegraff, 2000). A notable advantage was the comprehensive examination of the children's socialization environments (the quality and quantity of maternal and professional care) and the inclusion of social, emotional, and cognitive outcome measures. Another strength was the direct assessment of quantity of maternal care rather than relying on less reliable maternal employment data, which create doubts about the type and quantity of care. Nevertheless, the present study also had some weaknesses, which should be considered when drawing conclusions about the findings. First, we acknowledge that thirty percent of the original family sample recruited at baseline of the longitudinal study in 2012 was lost and drop-out mothers were younger and from the lowest SES level. Second, quality of preschool, and quantity of maternal care were based on a single assessment at 61 months, whereas quality of the home environment and quantity of childcare were based on accumulated data from 6 to 61 months. Third, the use of parent report measures to assess problem behavior and prosocial behavior may not provide objective information on child behavior, but be biased by parent's perceptions. Therefore future

research could be improved by integrating alternative assessment methods for child socioemotional adjustment which do not rely on parent report. Fourth, the utilized EFs measure mainly focuses on inhibition and cognitive flexibility, minimizing the demand on working memory through frequent rule repetition. Thus, future research might want to consider including a task that assesses working memory specifically in order to obtain a more complete understanding of the EFs processes underlying children's socioemotional and cognitive development.

Despite these limitations, this study extends our knowledge regarding the interrelations between family characteristics, child EFs, socialization environments and children's socioemotional adjustment and language ability in the Latin-American context of Chile. The current study supports Bronfenbrenner's bioecological framework, which emphasizes the importance of child characteristics, socialization environments, and cultural contexts for child development. Our results documenting associations between EFs and language ability imply that children in Chilean preschools might benefit from concerted efforts to enhance EF development. Apart from these findings at the child-level, we examined the socialization level and could partially corroborate results from our earlier work (Lohndorf et al., 2017). The quality of the home environment plays a crucial role in children's language ability. Another surprising outcome was that children who spend more time in childcare during early childhood actually demonstrated less language ability at preschool age. This finding might be related to the quality of pre-primary education. In this context is noteworthy that our results regarding the classroom quality of preschools in the Araucanía region were considerably less positive (on average inadequate) than those reported by other Chilean studies conducted in the Metropolitan or Bio-Bio regions, which found minimal quality (Herrera et al., 2005; Villalón, Suzuki, Herrera, & Mathiesen, 2002). This difference is likely due to the fact that the Araucanía region is one of the poorest and highest in rurality, includes the largest regional indigenous population (31.3% Mapuche) and has less availability of qualified teachers (Henríquez, 2013; INE, 2012; Mizala & Romaguera, 2000). Our findings highlight the importance of educational quality and equity during the preschool years. This is in line with OECD and UNICEF recommendations, which state that adequately preparing children for school during the highly formative years of early childhood and leveling the playing field for disadvantaged children are key to Chile's long-

term economic success (Hudson & Kühner, 2016; OECD, 2015). However, certainly more research is needed to better understand how child characteristics and socialization environments affect Chilean children in low-SES contexts during early childhood before we can pinpoint suitable areas for interventions. In conclusion, the current study confirms in a non-Western cultural context that parents providing stimulating and responsive homes contribute favorably to their children's language ability and that child EFs play a vital role in this process. Furthermore, our findings regarding the inadequate classroom quality of preschools provide new evidence from the south of Chile for the urgent necessity to improve the quality of Chilean children's pre-primary education as a catalyst for reducing social disparities.

References

Achenbach, T.M., & Rescorla, L.A. (2000). Manual for ASEBA Preschool Forms & Profiles. Burlington, VT: Research Center for Children, Youth, and Families, University of Vermont.

ACYF - Administration for Children, Youth & Families. (2003). *Head Start FACES (2000): A whole child perspective on program performance fourth progress report*. Washington, DC: Author. Retrieved from http://files.eric.ed.gov/fulltext/ED478791.pdf

AIM Asociación de Investigadores de Mercado. (2015). Informe sobre la actualización grupos socioeconómicos [Report about the update of socioeconomic groups]. Retrieved from http://www.aimchile.cl/descargue-aca-el-estudio-completo-sobre-nuevo-modelo-de-grupos-socioeconomicos

Baddeley, A. (2003). Working memory and language: an overview. *Journal of Communication Disorders, 36*, 189–208.

Barata, M. C. (2011). *Executive function skills in Chilean preschool children*. (Doctoral dissertation). Graduate School of Education. Harvard University. Retrieved from ProQuest Dissertations and Theses database. (UMI No. 3486021) https://search.proquest.com/docview/908960000?pq-origsite=gscholar

Bartels, M., Rietveld, M. J., Van Baal, G. C. M., & Boomsma, D. I. (2002). Genetic and environmental influences on the development of intelligence. *Behavior Genetics, 32*, 237–249.

Beitchman, J., & Brownlie, E. (2005). Language development and its impact on children's psychosocial and emotional development. In R. Tremblay, R. Barr, &R. Peters (Eds.). Montreal, Quebec: Centre of Excellence for Early Childhood Development and Strategic Knowledge. *Encyclopedia on Early Childhood Development [online]*, retrieved from http://www.child-encyclopedia.com/language-development-and-literacy/according-experts/language-development-and-its-impact-childrens

Belsky, J., Vandell, D. L., Burchinal, M., Clarke-Stewart, K. A., McCartney, K., & Owen, M. T. (2007). Are there long-term effects of early child care? *Child Development, 78*, 681–701.

Berger, L. M., Paxson, C., & Waldfogel, J. (2009). Income and child development. *Children and Youth Services Review, 31*, 978–989.

Bornstein, M. H. (1995). Form and function: Implications for studies of culture and human development. *Culture & Psychology, 1*, 123–137.

Bradley, R. H., Corwyn, R. F., McAdoo, H. P., & Garcia Coll, C. (2001). The home environments of children in the United States part I: Variations by age, ethnicity, and poverty status. *Child Development 72*, 1844–1867.

Bradley, R. H., & Corwyn, R. F. (2005). Caring for children around the world: A view from HOME. *International Journal of Behavioral Development, 29*, 468–478.

Brock, L. L., Rimm-Kaufman, S. E., Nathanson, L., & Grimm, K. J. (2009). The contributions of 'hot'and 'cool'executive function to children's academic achievement, learning-related behaviors, and engagement in kindergarten. *Early Childhood Research Quarterly*, *24*, 337–349.

Bronfenbrenner, U. (2005). *Making human beings human: Bioecological perspectives on human development*. Thousand Oaks, CA: Sage.

Bucarey, A., Ugarte, G., & Urzúa, S. (2014). *El efecto de la educación preescolar en chile*. [The effect of preschool education in Chile]. Technical report. Retrieved from http://clientes.hugoo.com/temp/99/banco/Impacto_Educ_Parvularia_SIMCE_marzo2014.pdf

Burchinal, M. R., & Cryer, D. (2004). Diversity, child care quality, and developmental outcomes. *Early Childhood Research Quarterly*, *18*, 401–426.

Burchinal, M., Kainz, K., & Cai, Y. (2011). How well do our measures of quality predict child outcomes? A meta-analysis and coordinated analysis of data from largescale studies of early childhood settings. In M. Zaslow, I. Martinez-Beck, K. Tout, & T. Halle (Eds.), *Quality measurement in early childhood settings* (pp. 11–31). Baltimore, MD: Brookes.

Burchinal, M., Vandergrift, N., Pianta, R., & Mashburn, A. (2010). Threshold analysis of association between child care quality and child outcomes for low-income children in pre-kindergarten programs. *Early Childhood Research Quarterly*, *25*, 166–176.

Bustos-Correa, C., Herrera, M. O., & Mathiesen, M. E. (2001). Calidad del ambiente del hogar: Inventario HOME como un instrumento de medición [Quality of the home environment: The HOME inventory as a measurement instrument]. *Estudios Pedagógicos 27*, 7–22.

Caldwell, B. M., & Bradley, R. H. (2003). *Home observation for measurement of the environment: Administration manual.* Little Rock, AR: University of Arkansas.

Caniguan, N. (2012). Infancia mapuche y migración en el Budi [Mapuche infancy and migration in the Budi]. *Revista Iberoamericana sobre Niñez y Juventud en Lucha por sus Derechos, 4,* 135–141.

Cárcamo, R. A., Vermeer, H. J., Van der Veer, R., Van IJzendoorn, M. H. (2015). Childcare in Mapuche and non-Mapuche families in Chile: the importance of socioeconomic inequality. *Journal of Child and Family Studies, 24*, 2668–2679.

CASEN - Ministry of Social Development. (2013a). The Situation of poverty in Chile. Retrieved from http://observatorio.ministeriodesarrollosocial.gob.cl/documentos/Casen2013_Situacion_Pobreza_Chile.pdf

CASEN - Ministry of Social Development. (2013b). Quintiles in Chile defined for 2015. Retrieved from http://noticias.universia.cl/cultura/noticia/2015/10/29/1132999/quintiles-2015-cuales-sirven.html

Clifford, R. M., Reszka, S. S., & Rossbach, H. G. (2010). Reliability and validity of the early childhood environment rating scale. Retrieved from http://ers.fpg.unc.edu/sites/ers.fpg.unc.edu/files/ReliabilityEcers.pdf

Coddington, C. H., Mistry, R. S., & Bailey, A. L. (2014). Socioeconomic status and receptive vocabulary development: replication of the parental investment model with Chilean preschoolers and their families. *Early Childhood Research Quarterly, 29*, 538–549.

Connor, C. M., Son, S. H., Hindman, A. H., & Morrison, F. J. (2005). Teacher qualifications, classroom practices, family characteristics, and preschool experience: Complex effects on first graders' vocabulary and early reading outcomes. *Journal of School Psychology*, *43*, 343–375.

Contreras, D., & González, S. (2015). Determinants of early child development in Chile: health, cognitive development and demographic factors. *International Journal of Educational Development 40*, 217-230.

Contreras, D., & Thiveos, E. (n.d.) Effects of Maternal Employment and Day Care: Evidence from the Early Childhood Longitudinal Survey in Chile. Retrieved from http://www.sociedadpoliticaspublicas.cl/archivos/BLOQUE_ST/Politica_social_y_pobreza_ll/Effects_of_Maternal_Employment_and_Day_Care.pdf

Cortázar, A. (2012). *Long-term effects of early childhood education on academic achievement in Chile* (Doctoral dissertation). Teachers College, Columbia University. Retrieved from ProQuest Dissertations and Theses database. (UMI No. 3492908)

Crijnen, A. A., Achenbach, T. M., & Verhulst, F. C. (1997). Comparisons of problems reported by parents of children in 12 cultures: total problems, externalizing, and internalizing. *Journal of the American Academy of Child & Adolescent Psychiatry*, *36*, 1269–1277.

Diamond, A., Carlson, S. M., & Beck, D. M. (2005). Preschool children's performance in task switching on the dimensional change card sort task: Separating the dimensions aids the ability to switch. *Developmental Neuropsychology*, *28*, 689–729.

Diamond, A. (2013). Executive functions. *Annual Review of Psychology*, *64*, 135–168.

Dunn, L. M., Padilla, E. R., Lugo, D. E., Dunn, L. M. (1986). *Manual del examinador para el Test de Vocabulario en Imágenes Peabody*. [The experimenter's manual of the Peabody Picture Vocabulary Test]. Minneapolis, MN: Pearson Assessment.

Engle, P. L., & Black, M. M. (2008). The effect of poverty on child development and educational outcomes. *Annals of the New York Academy of Sciences*, *1136*, 243–256.

Erel, O., Oberman, Y., & Yirmiya, N. (2000). Maternal versus nonmaternal care and seven domains of children's development. *Psychological Bulletin, 126*, 727–747.

Evans, G. W. (2004). The environment of childhood poverty. *American Psychologist*, *59*, 77–92.

Fabes, R. A., Matrin, C. L., Hanish, L. D., & Updegraff, K. A. (2000). Criteria for evaluating the significance of developmental research in the twenty-first century: Force and counterforce. *Child Development, 71*, 212–221.

Forget-Dubois, N., Dionne, G., Lemelin, J. P., Pérusse, D., Tremblay, R.E., & Boivin, M. (2009). Early Child Language Mediates the Relation Between Home Environment and School Readiness. *Child Development, 80,* 736–749.

Fuhs, M. W., & Day, J. D. (2011). Verbal ability and executive functioning development in preschoolers at head start. *Developmental Psychology, 47*, 404–416.

Gathercole, S. E., Pickering, S. J., Knight, C., Stegmann, Z. (2004).Working memory skills and educational attainment: evidence from National Curriculum assessments at 7 and 14 years of age. *Applied Cognitive Psychology, 18*, 1–16.

Grantham-McGregor, S., Cheung, Y. B., Cueto, S., Glewwe, P., Richter, L., Strupp, B., & International Child Development Steering Group. (2007). Developmental potential in the first 5 years for children in developing countries. *The Lancet, 369*, 60–70.

Halgunseth, L. C., Ispa, J. M., & Rudy, D. (2006). Parental control in Latino families: An integrated review of the literature. *Child Development, 77*, 1282–1297.

Harms, T., Clifford, R. M., & Cryer, D. (1998). *Early Childhood Environment Rating Scale-Revised*. New York: Teachers College Press.

Harms, T., Clifford, R. M., & Cryer, D. (2002). Early Childhood Environment Rating Scale-Revised. C. Dueñas (Translator), Escala De Calificación Del Ambiente De La Infancia Temprana - Edición Revisada. New York: Teachers College Press.

Henríquez, L. (2013). Cinco décadas de transformaciones en La Araucanía rural [Five decades of transformations in the rural Araucanía región]. *Polis Revista Latinoamericana, 12*, 147–134.

Herrera, M. O., Mathiesen, M. E., Merino, J. M., & Recart, I. (2005). Learning contexts for young children in Chile: process quality assessment in preschool centres. *International Journal of Early Years Education, 13*, 13–27.

Howes, C., Burchinal, M., Pianta, R., Bryant, D., Early, D., Clifford, R., & Barbarin, O. (2008). Ready to learn? Children's pre-academic achievement in pre-kindergarten programs. *Early Childhood Research Quarterly, 23*, 27–50.

Huaqing Qi, C., & Kaiser, A. P. (2003). Behavior problems of preschool children from low-income families: Review of the literature. *Topics in Early Childhood Special Education, 23*, 188–216.

Hudson, J., & Kühner, S. (2016). Fairness for Children. A league table of inequality in child well-being in rich countries (Unicef Innocenti Report Card 13), Florence: Unicef Innocenti Research Centre. Retrieved from https://www.unicefirc.org/publications/pdf/RC13_eng.pdf

Hughes, C., & Ensor, R. (2011). Individual differences in growth in executive function across the transition to school predict externalizing and internalizing behaviors and self-perceived academic success at 6 years of age. *Journal of Experimental Child Psychology, 108*, 663–676.

INE - Instituto Nacional de Estadísticas (2012). *Resultados XVIII Censo de Población* [Results XVIII of the population census]. Santiago de Chile. Government of Chile. Retrieved from https://www.cooperativa.cl/noticias/site/artic/20130425/asocfile/20130425190105/resultados_censo_2012_poblacion_vivienda_tomosiyii.pdf

Isenberg, J. P., & Quisenberry, N. (2002). A position paper of the Association for Childhood Education International PLAY: Essential for all Children. *Childhood Education, 79*, 33–39.

King, M., Smith, A., & Gracey, M. (2009). Indigenous health part 2: the underlying causes of the health gap. *The Lancet, 374*, 76–85.

Kirkham, N. Z., Cruess, L., & Diamond, A. (2003). Helping children apply their knowledge to their behavior on a dimension-switching task. *Developmental Science, 6*, 449–467.

Kochanska, G., DeVet, K., Goldman, M., Murray, K., & Putnam, S. P. (1994). Maternal reports of conscience development and temperament in young children. *Child Development, 65*, 852–868.

Lecannelier, F., Ewert, J. C. P., Groissman, S., Gallardo, D., Bardet, A. M., Bascuñan, A., & Rodríguez, J. (2014). Validación del Inventario de Conductas Infantiles para niños de entre 1½-5 años (CBCL 1½-5) en la Ciudad de Santiago [Standardization of the Child Behavior Inventory for children 1½-5 años (CBCL 1½-5) in the City of Santiago]. *Universitas Psychologica, 13*, 491–500.

Leyva, D., Weiland, C., Barata, M., Yoshikawa, H., Snow, C., Treviño, E., & Rolla, A. (2015). Teacher–child interactions in Chile and their associations with prekindergarten outcomes. *Child Development, 86*, 781–799.

Loeb, S., Bridges, M., Bassok, D., Fuller, B., & Rumberger, R. W. (2007). How much is too much? The influence of preschool centers on children's social and cognitive development. *Economics of Education Review, 26*, 52–66.

Lohndorf, R. T., Vermeer, H. J., Cárcamo, R. A., & Mesman, J. (2017). Preschoolers' vocabulary acquisition in Chile: The roles of socioeconomic status and quality of home environment. *Journal of Child Language (online first)*.

Lucas-Thompson, R. G., Goldberg, W. A., & Prause, J. (2010). Maternal work early in the lives of children and its distal associations with achievement and behavior problems: a meta-analysis. *Psychological Bulletin, 136*, 915–942.

Luijk, M. P. C. M., Linting, M., Henrichs, J., Herba, C. M., Verhage, M. L., Schenk, J. J., ... & IJzendoorn, M. H. (2015). Hours in non-parental childcare are related to language development in a longitudinal cohort study. *Child: Care, Health and Development 41*, 1188–1198.

Mashburn, A. J., Pianta, R. C., Hamre, B. K., Downer, J. T., Barbarin, O. A., Bryant, D., ... & Howes, C. (2008). Measures of classroom quality in prekindergarten and children's development of academic, language, and social skills. *Child Development, 79*, 732–749.

Mizala, A. & Romaguera, P. (2000). School performance and choice: the Chilean experience. *Journal of Human Resources, 35*, 392–417.

McClelland, M. M., Cameron, C. E., Connor, C. M., Farris, C. L., Jewkes, A. M., & Morrison, F. J. (2007). Links between behavioral regulation and preschoolers' literacy, vocabulary, and math skills. *Developmental Psychology, 43*, 947–959.

McClelland, M. M., Kessenich, M., & Morrison, F. J. (2003). Pathways to early literacy: The complex interplay of child, family, and sociocultural factors. *Advances in Child Development and Behavior, 31,* 412–448.

Morrison, F. J., & Cooney, R. R. (2002). Parenting and academic achievement: Multiple pathways to early literacy. In J. Borkowski, S. Ramey, & M. Bristol-Power (Eds.), *Parenting and the child's world: Influences on academic, intellectual, and social-emotional development*. Mahwah, NJ: Lawrence Erlbaum Associates.

Murray, K., & Kochanska, G. (2002). Effortful control: Factor structure and relation to externalizing and internalizing behaviors. *Journal of Abnormal Child Psychology, 30,* 503–514.

Najman, J. M., Williams, G. M., Nikles, J.,·Spence, S., Bor, W., O'Callaghan, M., Le Brocque, R., Andersen, M. J., Shuttlewood, G. J. (2001). Bias influencing maternal reports of child behavior and emotional state. *Social Psychiatry and Psychiatric Epidemiology, 36*, 186–194

Nancy, M. (2013). *Expressive One-Word Picture Vocabulary Test – four – Spanish Bilingual Edition (EOWPVT-4-SBE)*. Novato, CA: Academic Therapy Publications.

Narea, M. (2014). *Does Early Centre-based Care Have an Impact on Child Cognitive and Socio-emotional Development?: Evidence from Chile*. Centre for Analysis of Social Exclusion, London School of Economics.

Nayfeld, I., Fuccillo, J., & Greenfield, D. B. (2013). Executive functions in early learning: Extending the relationship between executive functions and school readiness to science. *Learning and Individual Differences, 26*, 81–88.

NICHD Early Child Care Research Network. (2000). The relation of childcare to cognitive and language development. *Child Development, 71*, 960–980.

NICHD Early Child Care Research Network. (2001). Nonmaternal care and family factors in early development: An overview of the NICHD Study of Early Child Care. *Journal of Applied Developmental Psychology, 22*, 457–492.

NICHD Early Child Care Research Network. (2003a). Do children's attention processes mediate the link between family predictors and school readiness? *Developmental Psychology, 39*, 581–593.

NICHD Early Child Care Research Network. (2003b). Does amount of time spent in child care predict socioemotional adjustment during the transition to kindergarten? *Child Development, 74*, 976–1005.

NICHD Early Child Care Research Network. (2004). Multiple pathways to early academic achievement. *Harvard Educational Review, 74*, 1– 29.

NICHD Early Child Care Research Network (Ed.). (2005). *Child care and child development: Results from the NICHD study of early child care and youth development*. Guilford Press: NY.

Noboa-Hidalgo, G. E., & Urzua, S. S. (2012). The effects of participation in public child care centers: Evidence from Chile. *Journal of Human Capital, 6*, 1–34.

Nomaguchi, K. M. (2006). Maternal Employment, Nonparental Care, Mother-Child Interactions, and Child Outcomes During Preschool Years. *Journal of Marriage and Family*, *68*, 1341–1369.

OECD. (2013). Family Database PF3.2. Enrolment in childcare and pre-school. OECD – Social Policy Division – Directorate of Employment Labour and Social Affairs. Retrieved from http://www.oecd.org/els/soc/PF3_2_Enrolment_childcare_preschool.pdf

OECD. (2014). *Education at a Glance 2014: OECD Indicators*, OECD Publishing, Paris. Retrieved from http://www.oecd-ilibrary.org/education/education-at-a-glance-2014_eag-2014-en

OECD. (2015). OECD Economic Surveys: Chile 2015, OECD Publishing, Paris. Retrieved from http://www.oecd-ilibrary.org/economics/oecd-economic-surveys-chile-2015_eco_surveys-chl-2015-en

Pachter, L. M., Auinger, P., Palmer, R., & Weitzman, M. (2006). Do parenting and the home environment, maternal depression, neighborhood, and chronic poverty affect child behavioral problems differently in different racial-ethnic groups? *Pediatrics*, *117*, 1329–1338.

Peisner-Feinberg, E. S., & Burchinal, M. R. (1997). Relations between preschool children's child-care experiences and concurrent development: The cost, quality, and outcomes study. *Merrill-Palmer Quarterly, 43,* 451–477.

Piñeiro, A., Manzano, M., Inguanzo, G., Reigosa, V. Morales A., & Fernández, C. (2000). Adaptación y normación de la prueba de vocabulario Peabody en una muestra de sujetos cubanos. [Adaptation and standardization of the Peabody Picture Vocabulary Test in a sample of Cuban subject]. *Revista Cubana de Psicología, 17,* 147–153.

Quintana, S. M., Aboud, F. E., Chao, R. K., Contreras-Grau, J., Cross, W. E., Hudley, C., ... & Vietze, D. L. (2006). Race, ethnicity, and culture in child development: Contemporary research and future directions. *Child Development*, *77*, 1129–1141.

Rescorla, L., Achenbach, T. M., Ivanova, M. Y., Harder, V. S., Otten, L., Bilenberg, N., . . . Verhulst, F. C. (2011). International comparisons of behavioral and emotional problems in preschool children: Parents' reports from 24 societies. Journal of Clinical Child and Adolescent Psychology, 40, 456–467.

Sameroff, A., & Chandler, M. (1975). Reproductive risk and the continuum of care-taking casualty. In F. Horowitz, E. Hetherington, P. Scarr-Salapatek, & A. Siegal (Eds.), *Review of child development research* (vol. 4, pp. 187-244). Chicago: University of Chicago Press.

Schoemaker, K., Mulder, H., Deković, M., & Matthys, W. (2013). Executive functions in preschool children with externalizing behavior problems: A meta-analysis. *Journal of Abnormal Child Psychology*, *41*, 457–471.

Scourfield, J., John, B., Martin, N., & McGuffin, P. (2004). The development of prosocial behaviour in children and adolescents: a twin study. *Journal of Child Psychology and Psychiatry*, *45*, 927–935.

Smith, D. W. (2001). Developmental milestones in children. *Current Therapeutics, 42*, 61–65.

Super, C. M. & Harkness, S. (2002). Culture structures the environment for development. *Human Development 45*, 270–274.

Strasser, K., & Lissi, M. R. (2009). Home and instruction effects on emergent literacy in a sample of Chilean kindergarten children. *Scientific Studies of Reading, 13*, 175–204.

Tabachnick, B. G., & Fidell, L. S. (1996). *Using multivariate statistics (3rd ed.)*. New York: Harper Collins.

Urzúa, S., & Veramendi, G. (2011). *The impact of out-of-home childcare centers on early childhood development*. Inter-American Development Bank.

Vandell, D. L., Belsky, J., Burchinal, M., Steinberg, L., & Vandergrift, N. (2010). Do effects of early child care extend to age 15 years? Results from the NICHD study of early child care and youth development. *Child Development, 81*, 737–756.

Villalón, M., Suzuki, E., Herrera, M. O., & Mathiesen, M. E. (2002). Quality of Chilean Early Childhood Education from an International Perspective. *International Journal of Early Years Education, 10*, 49–59.

Weiland, C., Ulvestad, K., Sachs, J., & Yoshikawa, H. (2013). Associations between classroom quality and children's vocabulary and executive function skills in an urban public prekindergarten program. *Early Childhood Research Quarterly, 28*, 199–209.

Weiland, C., Barata, M. C., & Yoshikawa, H. (2014). The co-occurring development of executive function skills and receptive vocabulary in preschoolaged children: A look at the direction of the developmental pathways. *Infant and Child Development, 23*, 4–21.

Williams, D. R. (1999). Race, socioeconomic status, and health the added effects of racism and discrimination. *Annals of the New York Academy of Sciences, 896*, 173–188.

Yeates, K. O., Bigler, E. D., Dennis, M., Gerhardt, C. A., Rubin, K. H., Stancin, T., ... & Vannatta, K. (2007). Social outcomes in childhood brain disorder: a heuristic integration of social neuroscience and developmental psychology. *Psychological Bulletin, 133*, 535–556.

Yoshida, H., Tran, D. N., Benitez, V., & Kuwabara, M. (2011). Inhibition and adjective learning in bilingual and monolingual children. *Frontiers in Psychology, 2*, 1–14. http://dx.doi.org/10.3389/fpsyg.2011.00210

Zachrisson, H. D., Dearing, E., Lekhal, R., & Toppelberg, C. O. (2013). Little evidence that time in child care causes externalizing problems during early childhood in Norway. *Child Development, 84*, 1152–1170.

Zaslow, M., Martinez-Beck, I., Tout, K., & Halle, T. (Eds.). (2011). *Quality measurement in early childhood settings*. Baltimore, MD: Brookes.

Chapter 6

General Discussion

General Discussion

In this dissertation we investigated associations between parenting processes, childcare experiences, contextual factors (ethnicity, SES), and preschool children's socioemotional adjustment and cognitive development in Chile. After the research topic was introduced in Chapter 1 and the historical and cultural context was outlined in Chapter 2, in Chapter 3 we examined the relationship between home environment and language development. Once ethnicity, SES, and parental caregiver status had been taken into account, it emerged that children's receptive and expressive vocabulary could be predicted by the quality of the home environment. Furthermore, it was found that the quality of the home environment mediated the relation between SES and receptive and expressive vocabulary acquisition, which is in agreement with the Family Investment Model. Chapter 4 revealed that maternal supportive discipline both predicted school readiness and mediated the relation between SES and school readiness, in accordance with the Family Stress Model. Chapter 5 demonstrated that the quality of the home environment and child executive functions (EFs) were positively associated with language ability, and that quantity of childcare was inversely related to language ability. No predictors of socioemotional adjustment emerged. The average quality of preschools was inadequate and did not predict child outcomes. The findings of these three chapters are integrated below. Theoretical implications, limitations, directions for future research, and implications for policy and practice are discussed.

Theoretical Implications

The studies presented in this dissertation were guided by Bronfenbrenner's bioecological model, which posits that child development is determined by biological characteristics (child), proximal processes (family and childcare) and more distal processes (cultural and economic contexts) (Bronfenbrenner, 2005). Our results support some relations outlined by this model in an as yet mostly unexplored Latin-American cultural context.

Parenting and child development. We found that proximal processes, such as parental cognitive stimulation, parental responsiveness, and sensitive behavioral control strategies were positively related to Chilean preschool children's language acquisition and school readiness. More responsive homes

during infancy, toddlerhood and preschool age, where children enjoyed more enriching learning experiences and more cognitive and linguistic stimulation affected children's receptive and expressive vocabulary growth favorably across the preschool period (Chapter 3 & 5). Associations between home stimulation and children's language acquisition are in line with prior Western (NICHD ECCRN, 2004) and Chilean research (Coddington, Mistry, & Bailey, 2014; Lohndorf, Vermeer, Cárcamo, & Mesman, 2017). Furthermore, our findings showed that children who received higher levels of maternal supportive discipline at 3½ years showed more school readiness abilities at age 5 (Chapter 4). Parental supportive discipline has so far only been linked to children's school readiness in Western samples (Chazan-Cohen et al., 2009; Connell & Prinz, 2002). We are the first to replicate these relations in a low-SES and bi-ethnic Chilean context. These findings moreover confirm elements of Ainsworth's attachment theory and Baumrind's parenting styles theory (Ainsworth, 1985; Baumrind, 1971). Mothers who are sensitive, responsive, nurturing, and consistent with limit-setting provide their children with more favorable emotion regulation, attentional, and communicative skills, which in turn are known to be vital precursors for school readiness (Blair, 2002).

Childcare and child development. Another proximal process affecting children's daily lives is professional childcare. With regard to preschool quality our 61 classroom observations revealed an inadequate level on average (Chapter 5). Three quarters of the preschool classrooms fell in the inadequate range, one quarter in the minimal range, and none in the good quality range. An 'inadequate' score indicates impersonalized low-quality childcare that does not meet either children's basic custodial care needs or children's developmental needs, according to the standards of the Early Childhood Environment Rating Scale (Harms, Clifford, & Cryer, 1998). Presumably due to overall low scores (range restriction) the quality of preschools did not predict child outcomes. Moreover childcare quality was measured at the group level and not at the individual level, whereas it is possible that the childcare an individual child receives differs from that received by his or her peers. In this context it is noteworthy that our results regarding the quality of preschools in the south of Chile (Araucanía and Lake region) were considerably less positive than those reported by other Chilean studies conducted in the Metropolitan region or Bio-Bio region, which found minimal quality (Herrera et al., 2005; Villalón, Suzuki, Herrera, & Mathiesen,

2002). This difference is likely due to the fact that the Araucanía region is one of the poorest and most rural regions, includes the largest regional indigenous population (31.3% Mapuche) and has less availability of qualified teachers (Henríquez, 2013; INE, 2012; Mizala & Romaguera, 2000). The low quality of childcare might also go some way to explaining why children who spent more time in childcare during early childhood showed less verbal ability at preschool age (Chapter 5). In line with this, one Chilean study reported that kindergarten teachers in Santiago de Chile dedicated very little time to language or literacy instruction; most of the time was spent on activities such as recess, snacks, going to the bathroom, and disciplining the children (Strasser & Lissi, 2009). Our findings underline the importance of the quality of early socialization environments (at home and in childcare) as a propelling force to reduce social disparities.

EFs and child development. Our results furthermore demonstrate that not only socialization environments, but also child characteristics rooted in neurobiology such as EFs significantly contribute to child outcomes. In Chapter 5 we found that EFs are positively associated with language acquisition (receptive and expressive vocabulary). EFs enable children to stay focused, keep information in mind, process novel information, mentally play with it, and flexibly adapt it to changing circumstances (Diamond, 2013). Given that all of these skills are vital for acquiring language it has been suggested that EFs could help children to improve their language ability (Diamond, 2013). In support of this view one study found that EFs at the beginning of the preschool predict child language at the end of preschool (Weiland, Barata, & Yoshikawa, 2014). However, it is also conceivable that the pathway is reversed. Another study has found verbal ability measured in fall to be predictive of EFs in spring of the same preschool year; accordingly it has been suggested that a larger vocabulary may improve children's EFs as they are better able to plan and control their behavior through self-talk (Fuhs & Day, 2011). Currently the direction of the developmental pathways between EFs and language acquisition is not known. However, independent of the direction of these relations (which might be difficult to disentangle as the neurobiological and cognitive mechanisms of both abilities are closely intertwined) our findings underline the important role of EFs for language development in a non-Western population.

Context and child development. Distal processes were also found to impact proximal processes: SES affected child language ability and school readiness indirectly through parenting processes (Chapter 3 and 4). These findings are in line with both the Family Investment Model and the Family Stress Model (Conger & Donnellan, 2007). According to our results (Chapter 3) SES indirectly affected children's language learning outcomes through the provision of an adequate language learning environment at home (cognitive stimulation, responsive parents and access to learning materials). Low-SES mothers in our sample provided less enriching home environments to their children and their children showed less favorable language outcomes. Our results hence add empirical support to the Family Investment Model, which highlights the importance of financial, educational, and occupational resources and parental investment in their children as pathways for child development.

Our results (Chapter 4) showed that SES indirectly affects children's school readiness outcomes through maternal supportive discipline. Low-SES mothers provided less supportive discipline and their children also demonstrated less school readiness. Our findings thus provide further support for the Family Stress Model in which low SES predicts less nurturing and involved parenting, ultimately leading to less favorable child outcomes (Conger & Donnellan, 2007). The mediating role of stimulating and sensitive parenting in the relation between SES and vocabulary acquisition and school readiness respectively is in line with prior research (Coddington et al., 2014; Lugo-Gil & Tamis-LeMonda, 2008). In Chapter 5, a direct effect of SES on language ability emerged; this effect was overridden, however, once EFs and the quality of the home environment were entered into the analysis. The studies for this dissertation provide evidence that even in low-SES populations marginal increases in SES can favorably affect parenting and child developmental outcomes. Moreover, the fact that adverse effects of SES may possibly be mitigated by parenting interventions opens up encouraging opportunities for research and practice in developing countries like Chile.

As our sample was bi-ethnic, we controlled for ethnicity in all three studies; however, no ethnic differences were detected between Mapuche minority and Chilean majority families with respect to parenting and preschooler's language ability, school readiness, and socioemotional adjustment. This could be explained by the fact that the vast majority of the national Mapuche population (80%) has been urbanized and acculturated to the dominant Chilean culture

(including language), which makes them largely indistinguishable from majority group members of the same social class (Caniguan, 2012). This finding possibly testifies to the extent of the culture loss the indigenous Mapuche community has suffered due to the expropriation of their land and breakup of their social structures (Duhart, 2003), because if their parenting practices are similar to those of the dominant culture it is unlikely that their traditional indigenous child-rearing practices will be transmitted to the next generation.

Limitations of the Research and Directions for Future Research

One of the risks of longitudinal studies is sample attrition. Over the 4.5 years of the project, 30% of the original sample was lost, which results in a relatively small sample size. Hence, for future research we recommend starting out with more participants, yet without sacrificing quality for quantity (the richness of the data – including observations and interviews, for example – should be maintained). This seems especially important in a low-SES context, as participating families are more likely to move residence, frequently change mobile phone numbers, and mostly do not have access to the internet. Starting out with a larger sample, however, does not counteract the inconvenient fact that the most vulnerable families (economically most disadvantaged and teenage or early twenties motherhood) are the most likely to leave the study, for multiple reasons intrinsically connected to their vulnerability. Maybe this issue could be alleviated by offering clever incentives tailored to the needs of these young and low-SES mothers, evidently without compromising the ethical principles for scientific research. The sample was drawn from the 37% of lower-class Chileans who earn less than US$ 202 per capita per month (AIM, 2015). Our participants are thus representative of the economically weakest segment of Chilean society, where children are most at-risk for developmental delays or developing disorders, but not of the entire population.

The socioeconomic vulnerability of the participating families entailed several challenges for the research team who carried out almost 400 home visits across their children's preschool period. First, families were difficult to trace from one time point to the next; they were also difficult to contact, because some families live in areas of poor network coverage and mothers work long hours or are otherwise unavailable. Second, families tended to live in marginal and unsafe urban sectors (including shanty towns) and some families lived in rural areas without an actual address (rural roads have no names and

houses no numbers). Third, most families lived in small homes, which were crowded, noisy, and unstructured (the TV was almost always on, for example). Fourth, data collection was also complicated by participants who were often not at home at the time of the scheduled appointment without cancelling the visit (despite receiving a reminder call the same day). Participants were geographically dispersed in a large area spanning a distance of 600 km from north to south. Consequently, almost daily the researchers travelled long distances without actually collecting data. Fifth, further difficulties included children's noncompliance with the research procedures even after parental intervention, and high levels of illness among children in winter (low-SES families have no heating). In these cases the research assistant had to return to the families another time to collect the missing data. Sixth, the nature of the families' limited and chaotic living space was not very conducive to testing children's cognitive abilities in a standardized manner. As a result, many children found it difficult to focus on the tasks and were easily distracted. Naturally not all of these issues can be remedied, but some can be dealt with in constructive ways in future research. We recommend reducing testing time and considering using a mobile lab. A mobile lab has the advantage of enabling researchers to visit families at their homes (facilitating participation by eliminating family travel), but to test the children in a less distracting environment. Ecological validity would need to be sacrificed to some degree in order to obtain more precise assessments of the children's actual cognitive competence levels.

We experienced some measurement difficulties. First, maternal self-efficacy and the child's socioemotional adjustment were measured using maternal report questionnaires. However, our results make us doubt whether the mothers reported the actual situation or whether they over- or underreported. In addition, 44% of Chile's adult population has reading comprehension impairments (Centro de Microdatos, 2013). In our low-SES sample this figure is likely to be higher which may have compromised the reliability and validity of the results. Future research should consider alternative measures (e.g., structured interviews or observations) to assess maternal self-efficacy, child problem behavior, and prosocial behavior, especially in low-SES samples. Second, it proved challenging to measure EFs in low-SES Chilean preschool children. We piloted nine commonly used EF tests for the age group of our sample and used four of them across the preschool period (T3 and T4), but of these only the Dimensional Change Card Sorting (Diamond, Carlson, & Beck,

2005) at Time 4 provided sufficient variation. The other tests were plagued with floor or ceiling effects. At 42 months a ceiling effect was found for the snack delay task (Kochanska, Murray, & Harlan, 2000), and floor effects were found for the pencil-tap (Diamond & Taylor, 1996) and head-toes-knees-shoulders task (Ponitz, McClelland, Matthews, & Morrison, 2009). At 61 months a ceiling effect was found for the pencil-tap (administered in the fist-palm version), day-and-night (Gerstadt, Hong, Diamond, 1994), non-digital cat-and-mouse task (Simpson, & Riggs, 2006), Simon says with soft toys (Jones, Rothbart & Posner, 2003), and gift delay task (Kochanska, Murray, & Harlan, 2000). In addition, at 61 months a floor effect was found for the backward digit span (Wechsler, 2014) and most parts of the head-toes-knees-shoulders test. This leads to questions about the universal applicability of these instruments. Low-SES children are expected to be delayed in their EF development, but additionally there might be culture-specific discrepancies in timing of the EF development that deserve further inquiry. It would furthermore be advisable for future longitudinal studies to start measuring EFs from infancy and not wait until preschool age. Third, apart from supportive discipline we measured four other maternal discipline behaviors (physical, harsh, lax and overreactive discipline), which showed very little variability due to non-occurrence of these behaviors during the 'don't touch' task. It is recommended that future research either focuses on different (maybe culture-specific) facets of maternal discipline during the 'don't touch' task, or interaction tasks are designed that trigger parental disciplining behavior that is more representative of daily routines. The 'don't touch' task comes with clear instructions to the mothers to prevent their children from touching the toys, hence the mothers did their best to please the research assistant and the cameras, knowing that this material would be reviewed by experts on child education. This is potentially an issue in all samples, but compliance with perceived 'authorities' might be especially salient in a Latin American low-SES sample. A possible solution could be prolonged observation in a naturalistic setting, which would enhance ecological validity, but would also be very time-intensive. Unfortunately, due to time and resource constraints, we were unable to carry out extensive pilot-testing of our assessment methods in the target population to prevent unexpected procedural problems. For future projects in populations that are rarely studied in parenting research, we strongly recommend that pilot-testing (of parenting measures and child outcome measures) be made an integral part of the study design so that

existing as well as culturally adapted procedures can be comprehensively tested for their feasibility before data collection.

Furthermore, we suggest including additional measures in future studies to obtain a more complete picture of the family processes that affect the child, such as maternal stress, marital discord, chaos, and crowding; this would make it possible to test more elements within the Family Stress Model. In addition, it would be useful to add more concrete measures of pre-academic stimulation that parents provide for their children (such as reading to them, helping them to write their first words, helping them to count objects, and encouraging them to recognize and pronounce sounds, letters and words); this would broaden our understanding of how parents foster their children's school readiness. With regard to assessing preschool quality, future studies could be complemented by measuring structural quality (such as teacher qualifications, adult-child ratio, groups-size, and space). Structural features are more enduring characteristics of a classroom and are more open to regulation by standards established by the government and hence deserve some research attention, especially in a developing country such as Chile.

Implications for Policy and Practice

It has been estimated that over 200 million children in developing countries do not reach their developmental potential in the first 5 years due to multiple-risk conditions associated with poverty (Grantham-McGreggor et al., 2007). Low-SES children are more likely than their affluent peers to perform less well academically. They show higher drop-out rates, move on to lower tertiary education if any, and are more likely to work in minimum-wage jobs or to be unemployed, which perpetuates the intergenerational cycle of poverty (Magnuson, Votruba-Drzal, 2008; Moore, 2005). Poverty-related disparities in child development and education are a national crisis in Chile (Contreras & Gonzalez, 2015; Martner, 2012). Our results demonstrate that low SES affects parenting and child outcomes unfavorably, and that it adversely determines developmental opportunities. In line with national statistics, the low-SES children in our sample only had access to preschool education of inadequate quality (OECD, 2015). The results of the current dissertation suggest that parenting and the quality of the home environment are potential pathways that could serve to diminish social inequities by improving the language acquisition, EFs, and school readiness of disadvantaged children, which in turn would

benefit their school outcomes. These findings are in agreement with research from Western countries that demonstrates that three facets of parenting are consistently favorably linked to young children's socioemotional and cognitive development: cognitive stimulation, parental sensitivity and responsiveness to the child, and parental affect (emotional warmth) (NICHD ECCRN, 2002; NRCIM, 2000). Although the effect of these child-caring practices is sensitive to contextual factors (such as poverty and cultural values and beliefs) they affect children from developed and developing countries in similar ways (Bradley, & Corwyn, 2005; Posada et al., 2002). A review of parenting interventions in developing countries has reported that improving young children's cognitive stimulation and learning opportunities (e. g. through teaching mothers educational play or verbal stimulation) has a significant and lasting impact on the children's cognitive functioning (Walker et al., 2007). This underlines the importance of early interventions. In Brazil a large-cluster randomized study reported promising parenting program (promoting book reading) outcomes in a low-resource setting: the program led to both enhancement of parent-child interactions and improved child vocabulary, working memory, and IQ (Weisleder et al., in press). Studies also show that intervention programs can improve positive parenting in low-SES and ethnic minority samples (Negrão, Pereira, M. Soares, & Mesman 2014; Yagmur, Mesman, Malda, Bakermans-Kranenburg, & Ekmekci, 2014). These improvements in parenting behaviors are assumed to transfer to gains in child development.

On the preschool level, previous studies in Western countries have shown that low-income children's self-regulation skills (EFs), vocabulary, and school readiness abilities could be improved through intervention programs integrated into the classroom curricula (Chicago School Readiness Project, CSRP); here self-regulation emerged as a mediating mechanism for children's increase in school readiness (Raver et al., 2011). Likewise, other school and preschool programs – such as the Tools of the Mind (Diamond, Barnett, Thomas, Munro, 2007), PATHS (Promoting Alternative Thinking Strategies) (Riggs, Greenberg, Kusché, & Pentz, 2006), and the Montessori curriculum (Lillard, & Else-Quest, 2006) – provide empirical support for the notion that EFs can be trained early in life by simple and cost-effective activities. A study in Chile found that higher pre-k classroom quality was linked to larger gains in children's school readiness (Leyva et al., 2015).

Results from the first large-scale randomized evaluation of a program to improve the quality of preschool education in Latin America, *Un Buen Comienzo* (A Good Start, UBC) in Chile, show that investing in preschool teachers' professional development can improve classroom quality after two years. However, no significant program impacts on child outcomes were detected at posttest (Yoshikawa et al., 2015). The results of the current dissertation (Chapter 5) demonstrated that average preschool classroom quality was inadequate. These findings are comparable to those of prior studies of Chilean preschool quality (Herrera, Mathiesen, Merino, & Recart, 2005; Strasser & Lissi, 2009; Villalón, Suzuki, Herrera, & Mathiesen, 2002), which found minimal quality. Our findings thus provide new evidence from the south of Chile for the urgent necessity to enhance preschool education in Chile. The low quality of preschools is alarming, because it means that high numbers of children will enter school without the cognitive, social, and emotional abilities they need to succeed. Furthermore, low-quality preschool education exacerbates developmental delays in socioeconomically disadvantaged children and hence contributes to the widening of the school achievement gap. Part of the effort to raise the quality of preprimary education should be to provide preschool teachers with the necessary knowledge and skills (e. g. by improving the quality of teacher training courses at university and establishing a national standard). This should contribute to ensuring more stimulating and higher quality learning environments, especially in the poorer and more rural south of Chile, where fewer qualified teachers are available (Mizala & Romaguera, 2000).

In Chapter 5, EFs were found to be related to language acquisition, corroborating prior findings of research in Western countries (McClelland et al., 2007; Weiland, Barata, & Yoshikawa, 2014). Interestingly, bilingualism appears to accelerate EF development as early as infancy and throughout childhood (Bialystok & Viswanathan, 2009; Kovács & Mehler, 2009). Evidence also suggests that EFs uniquely predict academic achievement from the earliest school grades through university, and EFs often override effects of child IQ (Alloway & Alloway, 2010; Bull & Scerif, 2001; Clark, Pritchard, & Woodward, 2010; Duckworth & Seligman, 2005) and family SES (as we found in Chapter 5). The literature also shows that the children who lag behind most on EFs (such as low-SES children) benefit most from any EF interventions (Flook et al., 2010; Karbach & Kray 2009; Lakes & Hoyt 2004). Therefore training

EFs early in life might be an effective way of addressing social disparities in academic attainment (O'Shaughnessy et al., 2003). Other activities that train school children's EFs include computerized trainings, aerobics, mindfulness, yoga, and taekwando traditional martial arts (Diamond, 2013).

Conclusions

The findings of this dissertation confirm the important role of positive parenting in child development in a novel Latin American sample. We demonstrated the applicability of two parenting practices in Chile that, in Western samples, consistently relate to positive child developmental outcomes: (1) parental cognitive stimulation and responsiveness and (2) maternal sensitivity to the child. In our study, preschool children who were growing up in more cognitively stimulating and responsive homes showed more language abilities, and mothers who provided supportive discipline had children with higher levels of school readiness. In line with the Family Investment Model and the Family Stress Model SES affected child language acquisition and school readiness indirectly through parenting processes (quality of the home environment and maternal supportive discipline). This suggests that the improving parenting practices can be an effective way to mitigate the adverse effects of SES. This is a promising result in a low-SES sample, given that SES itself is difficult to modify. To the best of our knowledge we are the first to confirm the operation of these mechanisms within the family in a bi-ethnic sample of indigenous Mapuche and Chilean families in the south of Chile. Furthermore, we found support for the important role of EFs in preschoolers' language development. Lastly, our findings revealed inadequate preschool classroom quality in an almost evenly distributed sample of public schools and government-dependent private schools in the south of Chile, where resources are limited. Consequently, low-SES preschoolers are ill-prepared at school entry, which jeopardizes their school success and contributes to the future perpetuation of poverty. This dissertation provides new evidence for the urgency of improving the quality of preprimary education in Chile, in order to make good quality education accessible to all (and not just the privileged few) as a catalyst for reducing social inequity. In closing, we would like to highlight that our work supports proposals that recommend investing in educating current and future parents and childcare professionals about the important role they play in the development and well-being of children and equipping them with the tool kit of knowledge and skills needed to provide good quality care.

We can conclude that children like Juanita can best be helped by higher quality parental and professional caregiving. This will prepare them better for school in both the cognitive domain (language ability, EFs and school readiness) and the socioemotional domain (emotion regulation, prosocial behavior). Childcare centers and preschools ideally include parent workshops and parenting programs to enhance parents' awareness about the importance of pre-academic stimulation and provide them with the necessary know-how and skills. As Juanita is Mapuche, her cognitive development could be enriched and improved by learning her native language Mapudungun. Furthermore, Juanita's EFs could be trained by offering extracurricular sports workshops at school, or sport activities at the local community center. In addition, community interventions in Juanita's neighborhood could include toy and book libraries that would contribute to more stimulation and learning opportunities in the home to create alternatives to TV (many children like Juanita do not possess a single book and have very few toys). Given the relatively high number of women who become pregnant in their teens and early twenties, it is also worth considering integrating child-rearing or parenting classes into secondary school curricula. In that way, Juanita's offspring could benefit from better informed and more skilled parents who will provide them with a better start in life.

References

AIM Asociación de Investigadores de Mercado. (2015). Informe sobre la actualización grupos socioeconómicos [Report about the update of socioeconomic groups]. Retrieved from http://www.aimchile.cl/descargue-aca-el-estudio-completo-sobre-nuevo-modelo-de-grupos-socioeconomicos

Ainsworth, M. D. (1985). Patterns of infant-mother attachments: antecedents and effects on development. *Bulletin of the New York Academy of Medicine, 61*, 792–811.

Alloway, T. P., & Alloway, R. G. (2010). Investigating the predictive roles of working memory and IQ in academic attainment. *Journal of Experimental Child Psychology, 106*, 20–29.

Baumrind, D. (1971). Current patterns of parental authority. *Developmental Psychology, 4*, 1–103.

Bialystok, E., & Viswanathan, M. (2009). Components of executive control with advantages for bilingual children in two cultures. *Cognition, 112*. 494–500.

Blair, C. (2002). School readiness: Integrating cognition and emotion in a neurobiological conceptualization of child functioning at school entry. *American Psychologist, 57*, 111–127.

Bradley, R. H., & Corwyn, R. F. (2005). Caring for children around the world: A view from HOME. *International Journal of Behavioral Development 29*, 468–478.

Bronfenbrenner, U. (2005). *Making human beings human: Bioecological perspectives on human development*. Thousand Oaks, CA: Sage.

Bull, R., & Scerif, G. (2001). Executive Functioning as a Predictor of Children's Mathematics Ability: Inhibition, Switching, and Working Memory. *Developmental Neuropsychology, 19*, 273–293.

Centro de Microdatos de la Universidad de Chile. (2013). Segundo Estudio de Competencias Básicas de la Población Adulta 2013 y comparación 1998-2013 [Second Study of Basic Competences of the Chilean Adult Population in 2013 and comparison with 1998-2013]. Retrieved from http://educacion2020.cl/sites/default/files/estudio_competencias_final.pdf

Caniguan, N. (2012). Infancia mapuche y migración en el Budi [Mapuche infancy and migration in the Budi]. *Revista Iberoamericana sobre Niñez y Juventud en Lucha por sus Derechos, 4,* 135–141.

Chazan-Cohen, R., Raikes, H., Brooks-Gunn, J., Ayoub, C., Pan, B. A., Kisker, E. E., ... & Fuligni, A. S. (2009). Low-income children's school readiness: Parent contributions over the first five years. *Early Education and Development, 20*, 958–977.

Coddington, C. H., Mistry, R. S., & Bailey, A. L. (2014). Socioeconomic status and receptive vocabulary development: replication of the parental investment model with Chilean preschoolers and their families. *Early Childhood Research Quarterly, 29*, 538–549.

Conger, R. D. & Donnellan, M. B. (2007). An interactionist perspective on the socioeconomic context of human development. *Annual Review of Psychology, 58*, 175–99.

Clark, C. A. C., Pritchard, V. E., & Woodward, L. J. (2010). Preschool executive functioning abilities predict early mathematics achievement. *Developmental Psychology, 46*, 1176–1191.

Contreras, D. & González, S. (2015). Determinants of early child development in Chile: health, cognitive development and demographic factors. *International Journal of Educational Development 40*, 217–230.

Connell, C. M., & Prinz, R. J. (2002). The impact of childcare and parent–child interactions on school readiness and social skills development for low-income African American children. *Journal of School Psychology*, *40*, 177–193.

Diamond, A. (2013). Executive functions. *Annual Review of Psychology*, *64*, 135–168.

Diamond, A., Barnett, W. S., Thomas, J., Munro, S. (2007). Preschool program improves cognitive control. *Science, 318*, 1387–1388.

Diamond, A., Carlson, S. M., & Beck, D. M. (2005). Preschool children's performance in task switching on the dimensional change card sort task: Separating the dimensions aids the ability to switch. *Developmental Neuropsychology*, *28*, 689–729.

Diamond, A., & Taylor, C. (1996). Development of an as- pect of executive control: Development of the abilities to remember what I said and to "do as I say, not as I do". *Developmental Psychobiology, 29*, 315–334.

Duckworth, A. L., & Seligman, M. E. P. (2005). Self-discipline outdoes IQ in predicting academic performance of adolescents. *Psychological Science, 16*, 939–944.

Duhart, D. (2003). Programas sociales, partidos políticos y liderazgos familiares: erosión del capital social en una comunidad Mapuche. En Arriagada, I. & Miranda, F. (Eds.) *Capital social: potencialidades analíticas y metodológicas para la superación de la pobreza*, [Social programs, political parties, and family leadership: erosion of the social capital in a Mapuche community. In Arriagada, I. & Miranda, F. (Eds.) Social capital: analytical and methodological potentialities in overcoming poverty], pp. 269-284. CEPAL: Santiago. Retrieved from http://200.9.3.98/handle/11362/6608

Flook, L., Smalley, S. L., Kitil, J. M., Galla, B. M., Kaiser-Greenland, S., Locke, J., et al. (2010). Effects of mindful awareness practices on executive functions in elementary school children. *Journal of Applied School Psychology, 26*, 70–95.

Fuhs, M. W., & Day, J. D. (2011). Verbal ability and executive functioning development in preschoolers at head start. *Developmental Psychology*, *47*, 404–416.

Gerstadt, C. L. Hong, Y. J., & Diamond, A. (1994) The relationship between cognition and action: performance of children 3 ½ –7 years old on a Stroop-like day–night test. *Cognition, 53*, 129–153

Grantham-McGregor, S., Cheung, Y. B., Cueto, S., Glewwe, P., Richter, L., Strupp, B., & International Child Development Steering Group. (2007). Developmental potential in the first 5 years for children in developing countries. *The Lancet*, *369*, 60–70.

Harms, T., Clifford, R. M., & Cryer, D. (1998). *Early Childhood Environment Rating Scale-Revised*. New York: Teachers College Press.

Henríquez, L. (2013). Cinco décadas de transformaciones en La Araucanía rural [Five decades of transformations in the rural Araucanía región]. *Polis Revista Latinoamericana, 12*, 147–134.

Herrera, M. O., Mathiesen, M. E., Merino, J. M., & Recart, I. (2005). Learning contexts for young children in Chile: process quality assessment in preschool centers. *International Journal of Early Years Education, 13*, 13–27.

INE - Instituto Nacional de Estadísticas (2012). *Resultados XVIII Censo de Población* [Results XVIII of the population census]. Santiago de Chile. Government of Chile. Retrieved from https://www.cooperativa.cl/noticias/site/artic/20130425/asocfile/20130425190105/resultados_censo_2012_poblacion_vivienda_tomosiyii.pdf

Jones, L.B., Rothbart, M.K., & Posner, M, I. (2003) Development of executive attention in preschool children. *Developmental Science, 6*, 498–504.

Karbach, J., & Kray, J. (2009). How useful is executive control training? Age differences in near and far transfer of task-switching training. *Developmental Science, 12*, 978–990.

Kochanska, G., Murray, K. T., & Harlan, E. T. (2000). Effortful control in early childhood: Continuity and change, antecedents, and implications for social development. *Developmental Psychology, 36*, 220–232.

Kovács, A. M., & Mehler, J. (2009). Cognitive gains in 7-month-old bilingual infants. *Proceedings of the National Academy of Sciences of the United States of America, 106*, 6556–60.

Lakes, K. D., & Hoyt, W. T. (2004). Promoting self-regulation through school-based martial arts training. *Applied Developmental Psychology, 25*, 283–302

Leyva, D., Weiland, C., Barata, M., Yoshikawa, H., Snow, C., Treviño, E., Rolla, A. (2015). Teacher–Child Interactions in Chile and Their Associations With Prekindergarten Outcomes. *Child Development, 86*, 781–799.

Lillard, A., & Else-Quest, N. (2006). The early years: Evaluating Montessori education. *Science, 313*, 1893–1894.

Lohndorf, R. T., Vermeer, H. J., Cárcamo, R. A., & Mesman, J. (2017). Preschoolers' vocabulary acquisition in Chile: The roles of socioeconomic status and quality of home environment. *Journal of Child Language (online first)*.

Lugo-Gil, J., & Tamis-LeMonda, C. S. (2008). Family resources and parenting quality: Links to children's cognitive development across the first 3 years. *Child Development, 79*, 1065–1085.

Magnuson, K., & Votruba-Drzal, E. (2008). Enduring influences of childhood poverty. In: Danziger, S.; Cancian, M., editors. *Changing poverty, changing policies*. Sage; New York, NY: 2009. p. 153–179.

Martner, G. (2012) La crisis de la educación chilena. *Políticas públicas, 5*, 51-82. Retrieved from http://www.revistas.usach.cl/ojs/index.php/politicas/article/viewFile/993/943

McClelland, M. M., Cameron, C. E., Connor, C. M., Farris, C. L., Jewkes, A. M., & Morrison, F. J. (2007). Links between behavioral regulation and preschoolers' literacy, vocabulary, and math skills. *Developmental Psychology, 43*, 947–959.

Mizala, A. & Romaguera, P. (2000). School performance and choice: the Chilean experience. *Journal of Human Resources, 35*, 392–417.

Moore, K. (2005) Thinking about youth poverty through the lenses of chronic poverty, life-course poverty and intergenerational poverty. CPRC Working Paper 57. Manchester: Chronic Poverty Research Centre.

Negrão, M., Pereira, M., Soares, I., & Mesman, J. (2014). Enhancing positive parent-child interactions and family functioning in a poverty sample: A randomized control trial. *Attachment & Human Development, 16,* 315–328.

NICHD Early Child Care Research Network. (2002). Early child care and children's development prior to school entry: Results from the NICHD Study of Early Child Care. *American Education Research Journal, 39*, 133–164.

NICHD Early Child Care Research Network. (2004). Multiple pathways to early academic achievement. *Harvard Educational Review, 74*, 1–29.

NRCIM -National Research Council and Institute of Medicine. (2000). *From neurons to neighborhoods. The science of early childhood development.* Washington DC: National Academy Press.

OECD. (2015). OECD Economic Surveys: Chile 2015, OECD Publishing, Paris. Retrieved from http://www.oecd-ilibrary.org/economics/oecd-economic-surveys-chile-2015_eco_surveys-chl-2015-en

O'Shaughnessy, T., Lane, K. L., Gresham, F. M., & Beebe-Frankenberger, M. (2003). Children placed at risk for learning and behavioral difficulties: Implementing a school-wide system of early identification and prevention. *Remedial and Special Education, 24*, 27–35.

Ponitz, C. C., McClelland, M. M., Matthews, J. S. & Morrison, F. J. (2009). A structured observation of behavioral self-regulation and its contribution to kindergarten outcomes. *Developmental Psychology, 45*, 605–619.

Posada, G., Jacobs, A., Richmond, M. K., Carbonell, O. A., Alzate, G., Bustamante, M. R., et al. (2002). Maternal caregiving and infant security in two cultures. *Developmental Psychology, 38*, 67–78.

Raver, C. C, Jones, S. M. , Li-Grining, C., Zhai F., Bub K., Pressler E. (2011). CSRP's impact on low-income preschoolers' preacademic skills: self-regulation as a mediating mechanism. *Child Development, 82*, 362–78.

Riggs, N. R., Greenberg, M. T., Kusché, C. A., Pentz, M. A. (2006). The mediational role of neurocognition in the behavioral outcomes of a social-emotional prevention program in elementary school students: effects of the PATHS curriculum. *Prevention Science, 7*, 91–102.

Simpson, A., & Riggs, K. J. (2006). Conditions under which children experience inhibitory difficulty with a "button-press" go/ no-go task. *Journal of Experimental Child Psychology, 94*, 18–26.

Strasser, K., & Lissi, M. R. (2009). Home and instruction effects on emergent literacy in a sample of Chilean kindergarten children. *Scientific Studies of Reading, 13*, 175–204.

Villalón, M., Suzuki, E., Herrera, M. O., & Mathiesen, M. E. (2002) Quality of Chilean Early Childhood Education from an International Perspective. *International Journal of Early Years Education, 10*, 49–59.

Walker, S. P., Wachs, T. D., Gardner, J. M., Lozoff, B., Wasserman, G. A., Pollitt, E., ... & International Child Development Steering Group. (2007). Child development: risk factors for adverse outcomes in developing countries. *The Lancet, 369*, 145–157.

Wechsler, D. (2014). *Wechsler intelligence scale for children-fifth edition*. Bloomington, MN: Pearson.

Weiland, C., Barata, M. C., & Yoshikawa, H. (2014). The co-occurring development of executive function skills and receptive vocabulary in preschool-aged children: A look at the direction of the developmental pathways. *Infant and Child Development, 23*, 4–21.

Weisleder, A., Mazzuchelli, D.S.R., Lopez, A.S., Duarte Neto, W., Cates, C.B., Gonçalves, H., Fonseca, R.P., Batista, J. & Mendelsohn, A. (in press). Reading aloud and child development: A cluster randomized trial in Brazil. *Pediatrics.*

Yagmur, S., Mesman, J., Malda, M., Bakermans-Kranenburg, M.J., & Ekmekci, H. (2014). Video-feedback intervention increases sensitive parenting in ethnic minority mothers: A randomized control trial. *Attachment & Human Development, 16*, 371–386.

Yoshikawa, H., Leyva, D., Snow, C. E., Treviño, E., Barata, M., Weiland, C., et al. (2015). Experimental impacts of a teacher professional development program in Chile on preschool classroom quality and child outcomes. *Developmental Psychology, 51*, 309–322.

Chapter 7

Appendices

Epilogue

> "Like a human body, society functions through the unified, specialized functions of its constituent parts. Every human being is part of this organic entity, and his or her functioning affects the well-being of the whole organism." ~ *Danesh*

No dissertation investigating an indigenous population is complete without some cultural considerations. Cultural socialization refers to parenting practices that teach children in their native language about their ethnic history, heritage, social norms and customs, values, arts and crafts, skills, and knowledge, thereby guaranteeing cultural transmission from one generation to the next. The vast majority of Mapuche indigenous people have been urbanized and acculturated to the dominant Chilean culture and have adopted the colonial language Spanish. The Mapuche people have witnessed substantial culture loss over the past centuries, and the more culture is lost, naturally the less can be transmitted to the next generation, causing a downwards spiral ultimately leading to cultural extinction. In this dissertation, investigating parenting practices and socialization environments, ethnicity was taken into account, but no ethnic differences between the participating Mapuche families and Chilean families were found. This finding seems to give us a glimpse of the extent of the culture loss the Mapuche people have suffered. As preserving cultural diversity is an important goal in its own right and the Mapuche are the biggest minority group in Chile it is crucial for early child development researchers to dedicate some attention to this topic.

According to the Convention on the Rights of a Child (United Nations, 1990), children of minority communities and indigenous populations have the right to enjoy their own culture freely without discrimination and to practice their own religion and language. Many Mapuche children at present still experience violations of these basic human rights (Merino, 2007). Moreover, the school system is exclusively Western and leaves no room for indigenous knowledge and world views. However, as school attendance is obligatory by law indigenous parents have no alternative but to send their children to public schools, where their sons and daughters are inevitably socialized into the dominant culture. It is noteworthy that still about half of the indigenous adolescents (a total number of 21,115 Mapuche between 14 and 18 years in

the Araucanía region) attend urban boarding schools (Silva-Peña, Moya, & Salgado, 2011). Many Mapuche families live in remote rural areas without secondary schools and the government is attempting to fulfill its obligation of making education universally accessible (clearly education is also one of the children's rights according to the United Nations Convention). Nevertheless, in this particular case the right to an education conflicts with the right to enjoy indigenous culture, language, and religion freely as contact with family and culture is even further reduced when adolescents attend boarding schools (history has shown that the systematic implementation of boarding schools for indigenous children accelerated cultural genocide). Further, the native language Mapudungun was prohibited in schools until 1994 with the excuse that it would endanger the assimilation of indigenous people into Chilean culture (Pfefferle, 2015). Only in 2009 was the Supreme Decree No 280 issued, stating that it is obligatory to teach four hours of Mapudungun weekly in schools where more than 50% of the student body are indigenous. This effort seems to be "too little - too late" to save Mapudungun from the verge of extinction, but it provides a starting point, as it at least recognizes the importance of language preservation. In recent years some childcare centers and preschools also started to provide intercultural classes about indigenous culture and language once a week. In sum, few tentative attempts have been made to promote diversity in Chile, but they seem utterly insufficient to sustainably preserve what is left of Mapuche culture and language. In the south of Chile it is currently debated how to approach the topic of the education of indigenous children in a Western school context. Many Mapuche communities claim their right for more freedom and autonomy in the education of their offspring, yet so far no mutually satisfying solution has been found. Interestingly, a recent public opinion survey showed that 95% of the participating Chileans thought it is important that Mapuche children learn their language and almost 75% of the participants even believed it is important that Mapudungun is taught in school to some degree to all Chilean children regardless of their ancestry (Pfefferle, 2015). So even public voices are becoming louder in support of the native population of their shared homeland.

I hereafter dedicate some thought to the challenges that present themselves when two worlds meet: the Western and the indigenous one. The study of the history of education has focused almost entirely on a single educational tradition (the Western one), to the exclusion of virtually all others (Reagan, 2000). The empirical study of indigenous child development and education

has also been notoriously neglected. Science only recently started to address the severe skewness of human samples in developmental and behavioral research, whereby 88% of the world population are not represented (Henrich, Heine, & Norenzayan, 2010). The quest to decolonize research has just begun as awareness of the importance of the inclusion of non-Western samples and scholars is growing, but there is still a long way to go. Furthermore, the Western world view inherently struggles with the challenge of ethnocentrism and even science is not free from cultural assumptions and biases as "scientists work from models acquired through education and through subsequent exposure to the literature often without quite knowing or needing to know what characteristics have given these models the status of community paradigms." (Patton, 1978, p. 203). Paradigms help us to break down the complexity of the real world, but they also hide unquestioned patterns of thought and make us overlook important aspects of reality. For example, Western scholars have tended to equate "education" with "schooling" and focused predominantly on literacy and literary tradition, which had as consequence that many relevant educational traditions have not been examined, as they were beyond the expectations of their paradigm (Reagan, 2000). Nevertheless, indigenous cultures around the world have been educating their children for centuries if not millennia in holistic ways - long before the rise of European empires and nations - and some of their civilizations have reached great heights (Reagan, 2000).

Indeed, the Western world view is limited in its own way, "The conventional wisdom (inherent to the Western paradigm) has been that colonial contact - and more recently development- would free the less fortunate in indigenous societies from poverty, hunger and illiteracy" (Hong, 1995, p. 129). The development advocated was all too often equated with economic growth, a development concept which has proven to be highly problematic if we consider that the indigenous peoples continue to be over-represented among the poor, the illiterate, and the unemployed according to a United Nations report (United Nations, 2009). While indigenous peoples constitute approximately 5% of the world's population, they make up 15% of the world's poor and about one-third of the world's extremely poor rural people. "In the process of imitating a Western model, [indigenous] communities everywhere have been losing out. Traditionally self-reliant societies become dominated by outside forces that are more powerful economically and politically. Individuals and communities are left with little or no control over their existence and livelihood" (Hong, 1995, p. 129).

One area in which indigenous communities have lost control over their existence is the education of their children. According to a United Nations report "indigenous students frequently find that the education they are offered by the state promotes individualism and a competitive atmosphere, rather than communal ways of life and cooperation. They are not taught relevant survival and work skills suitable for indigenous economies, and they often return to their communities with a formal education that is irrelevant or unsuitable for their needs" (United Nations, 2009, p. 143). In other words, Western school systems installed in indigenous communities contribute to the systematic destruction of traditional sustainable agricultural and ecological knowledge, to the breakup of extended families and communities, to culture and language loss, and to the devaluation of ancient spiritual traditions. In essence Western education to indigenous children is a door through which the young could go and not return, predominantly driving them into poverty and dependence instead of liberating them of ignorance and hunger as is assumed by the Western paradigm.

Turning to my own scholarly field of study: the general rationale behind Western developmental science is to generate knowledge, which when applied can facilitate child development and thereby enhance child health, well-being, school achievement, and life success. This approach is very Western in the sense that it is scientific, systematic, and promotes certain compartmentalized aspects of life which are important for the functioning of Western societies, whereas indigenous societies operate in a state of relatedness and connectedness between people and their natural environment; they have a holistic view on life. Considering cultural differences I have to question the universal applicability of the Western scientific rationale. One can assume that most indigenous parents would not object to increased health and well-being of their children (although some might prefer to rely on traditional healers rather than on Western scientists unknown to them). Many indigenous parents, however, might be reluctant to sign up for the improvement of school and life success of their children, as they experience schools as alien to their culture and their life goals and life success are defined very differently compared to Western views. Inherent in the Western rationale is the notion of optimizing human efficiency, productivity, and success (measured in income, assets, educational level, and occupational status). These values are important in Western individualistic and competitive societies, as they are aligned with

Western economies, which focus on personal gain. Indigenous economies however, operate based on cooperation and their objective is collective wealth (Mead, 2002). Indigenous communities also have a distinctive set of beliefs and values rooted in their worldviews, key concepts of which are sustainability, harmony with and feeling part of nature, communal sharing and exchange of resources, group cohesion, kinship, respect for family and authority, humility, honoring of ancestors, and spirituality. The indigenous emphasize personal, social, moral, and spiritual development, rather than cognitive or academic development as is common in Western industrialized societies. As professionals working with indigenous populations we need to be aware of these cultural differences, as they have implications for research, practice, and policy.

The indigenous and Western worldview are undoubtedly of contradictory nature, which implies potential for conflict when these two systems coincide in the same geographical area, but cultural diversity also offers the opportunity for mutual learning, enrichment, and unique contributions. It is imperative that Chilean children of both ethnic groups are taught that both worldviews have an equal right to exist and that none is superior to the other so that discrimination, racism, and marginalization can make way for tolerance, respect, and appreciation. In a multi-ethnic country with a colonial background such as Chile, promoting diversity in schools should be mandatory and integrative part of daily school routine, in order to heal the scars of the past and build a peaceful multicultural future. Our data revealed that diversity was basically not promoted in the preschools we observed contrary to curricular guidelines by the Ministry of Education. The item "Promoting acceptance of diversity" of the *Early Childhood Environment Rating Scale* revealed that 69% of the preschools did so to an inadequate degree, 20% to a minimal degree, 9% to a neutral degree, and only 2% to a good degree. Zooming in to the item-level would have been beyond the scope of this dissertation, but in this context it is relevant to have a closer look to classroom activities. This result is disturbing, because the preschools under study were located in regions where 1 in 3 (Araucanía) and 1 in 5 (Los Lagos) children are Mapuche

Studies also show that self-governance, contact with the land (thus no urban boarding schools), and preservation of ethnic culture and language are all associated with increased physical and mental health outcomes of indigenous people (Chandler & Lalonde, 1998; Garnett, et al., 2009). It seems

we can kill three birds with one stone if we return some educational autonomy to the Mapuche: (1) we prevent the extinction of ethnic culture and language, (2) we improve health and well-being, and (3) we reduce public expenses (health and social benefits) as the Mapuche children will be able to function within their indigenous economies again. There is a sense of urgency to resolve the issue of indigenous education, because if we wait one or two generations more it might be too late to resuscitate Mapuche culture and language. Action needs to be taken in the immediate future. I would like to conclude with a quote by the indigenous scholar Gregory Cajete:

> "A primary orientation of Indigenous education is that each person is their own teacher and that learning is connected to each individual's life process. Meaning is looked for in everything, especially in the workings of the natural world. All things comprising Nature are teachers of mankind; what is required is a cultivated and practiced openness to the lessons that the world has to teach. Ritual, mythology, and the art of storytelling – combined with the cultivation of relationship to one's inner self, family, community, and natural environment – are utilized to help individuals realize their potential for learning and living a complete life. Individuals are enabled to reach completeness by learning how to trust their natural instincts, to listen, to look, to create, to reflect and see things deeply, to understand and apply their intuitive intelligence, and to recognize and honor the teacher of spirit within themselves and the natural world. This is the educational legacy of Indigenous people." (Cajete, 1994, p. 227).

References

Cajete, G., (1994). *Look to the Mountain: An ecology of indigenous education 227. Skyland: NC* Kivaki Press.

Chandler, M. J. & Lalonde, C. (1998). Cultural continuity as a hedge against suicide in Canada's First Nation. In Kirmayer y Valaskakis (eds.). The Mental Health of Canadian Aboriginal Peoples: Transformations, Identity, and Community. UBC Press.

Garnett, S.T., Sithole, B., Whitehead, P.J., Burgess, C.P., Johnston, F.H., Lea, T. (2009). Healthy country, healthy people: policy implications of links between Indigenous human health and environmental condition in tropical Australia. *The Australian Journal of Public Administration,* 68, 53–66.

Hong, E. (1995). The impact of modernization on indigenous peoples: the case of the Sarawak. In Norberg-Hodge, H., Goering, P. & Gorelick, S. (Eds,), *The future of progress: Reflections on environment and development* (p.129-140). Foxhole, Dartington, Totnes, Devon: UK. Green Books.

Mead, A. (2002). Working with aboriginal worldviews. Retrieved from http://www.donpugh.com/Psych%20Interests/ABORIGINES/SIX%20DIFFERENCES%20BETWEEN%20ABORIGINAL%20and%20%60WESTERN'%20WORLD%20VIEWS-,.pdf

Merino, M. E. (2007). El discurso de la discriminación percibida en Mapuches de Chile.[The discourse of perceived discrimination among the Mapuche in Chile]. *Discurso & Sociedad, 1*, 604–622.

Patton, M., 1978. *Utilization-Focused Evaluations.* Beverly Hills, CA.

Pfefferle, J. (2015). El interés chileno por aprender y conservar el idioma mapudungun en Chile.[The Chilean interest in the conservation and learning of the native language Mapudungun]. *Onomázein,* 32, 305–314

Silva-Peña, I., Moya, M., & Salgado, I. (2011). Estudio sobre niños y niñas adolescentes mapuche residentes en internados de la Región de La Araucanía, Chile Santiago [A study about Mapuche adolescents residing in boarding schools in the Araucanía región]. UNICEF Report Retrieved from: http://www.unicef.cl/web/wp-content/uploads/doc_wp/WD%20internados.pdf

Reagan, T. (2000). *Non-Western educational traditions: alternative approaches to educational thought and practice*. Mahwah: NJ. Erlbaum.

United Nations. (1990). *Convention on the Rights of a Child* Retrieved from http://www.ohchr.org/Documents/ProfessionalInterest/crc.pdf

United Nations. (2009). *The state of the world's indigenous people*. Department of Economic and Social Affairs. Retrieved from http://www.un.org/esa/socdev/unpfii/documents/SOWIP/en/SOWIP_web.pdf

Resumen en Español (Summary in Spanish)

Este libro describe la segunda fase del estudio longitudinal *Magallan-Leiden Childcare Study*, iniciado en 2012 con 110 madres y sus infantes nacidos entre Mayo y Octubre de 2011 (Cárcamo, Vermeer, Van der Veer, & Van IJzendoorn, 2015). La muestra de participantes se reclutó en el sur de Chile (Región de La Araucanía y Región de Los Lagos) y consistió de familias de un nivel socioeconómico (NSE) bajo provenientes de dos grupos étnicos: el grupo minoritario mapuche y el grupo mayoritario chileno. La primera fase del estudio (Tiempo 1 a los 6 meses y Tiempo 2 a los 15 meses) se enfocó en los ambientes de crianza y el desarrollo socio-emocional en la infancia. La segunda fase del estudio se dedicó a la contribución del ambiente de crianza al desarrollo cognitivo y socio-emocional de niños preescolares (Tiempo 3 a los 42 meses y Tiempo 4 a los 61 meses). Más específicamente se investigó si hay relaciones entre el NSE, la etnia, la crianza en el hogar y la educación parvularia con el desarrollo infantil en el ámbito de funciones ejecutivas, aptitud escolar (alfabetización temprana y matemática temprana), adquisición del lenguaje, problemas de conducta y comportamiento prosocial de niños entre tres años y medio y cinco años.

El Desarrollo Infantil Durante el Periodo Preescolar

La edad preescolar se caracteriza por grandes avances en el dominio del desarrollo cognitivo y socio-emocional. El vocabulario receptivo y expresivo se expanden rápidamente (Carey, 1978; Slobin, 1978) y habilidades cruciales de aptitud escolar como la alfabetización temprana (conciencia fonológica, conocimiento del alfabeto, lectura temprana y escritura temprana) y la matemática temprana (identificación de números y sentido de números) comienzan a emerger (Jordan, Kaplan, Locuniak, & Ramineni, 2007; Purpura, 2009; Whitehurst & Lonigan, 1998). Cambios significativos también ocurren con respecto a las funciones ejecutivas (FEs): niños a esta edad ya son capaces de almacenar información en la memoria, inhibir impulsos, cambiar de perspectiva y controlar su conducta (Diamond, 2002). En el ámbito socio-emocional también hay progreso: los niños aprenden gradualmente comportamiento prosocial (por ejemplo empatía, cooperación, ayudar y compartir) y la regulación de sus emociones (Eisenberg, 2003; Bridges, Denham, & Ganiban, 2004). El desarrollo en estos dominios durante la edad preescolar establece las

bases para trayectorias de desarrollo posteriores y es co-responsable de la salud física y mental, el funcionamiento social y el éxito escolar y laboral futuro de un individuo (Diamond, 2013; Duncan et al., 2007).

Socialización Temprana

El avance en los distintos dominios de desarrollo depende de procesos de socialización en el ambiente del niño y factores contextuales como el NSE y la cultura (etnia) de la familia. En Chile 90% de los niños de 4 y 5 años y 29% de los niños entre 0 y 3 años atienden a la educación parvularia (CASEN, 2015). Por consiguiente el ambiente familiar y de la educación parvularia son los ambientes de socialización más influyentes para niños preescolares. Un ambiente positivo en el hogar se caracteriza por la provisión de experiencias de aprendizaje variadas y enriquecedoras (por ejemplo la disponibilidad de libros y juguetes, actividades culturales, visitas y viajes), estimulación cognitiva, calidez interpersonal y responsividad (Caldwell & Bradley, 2003), y disciplina apoyadora (Ainsworth, 1985; Baumrind, 1971). Disciplina apoyadora significa que los padres reaccionan sensitivamente a los señales de su hijo y regulan el comportamiento de éste de manera positiva (por ejemplo, los padres son consecuentes con reglas y límites, dan explicaciones claras y distraen a su hijo si es necesario). La crianza está influida también por la auto-eficacia de los padres, esto quiere decir las creencias que los padres tienen sobre su capacidad de organizar y ejecutar las tareas de crianza (Monigny, 2005). Las creencias que las padres tienen influyen las prácticas de crianza a través de procesos cognitivos, afectivos y selectivos (Bandura, 1993, Montigny & Lacharité, 2005). Un ambiente positivo en el establecimiento de educación parvularia se caracteriza por una infraestructura adecuada (por ejemplo cumple los requisitos de seguridad, espacio suficiente, calefacción, disponibilidad de libros y materiales didácticos), una variedad de estimulación física, cognitiva, lingüística y artística, disciplina positiva e interacciones sociales cálidas con las educadoras y compañeros (Harms, Clifford, & Cryer, 1998; NICHD, 2005). Estudios demuestran consistentemente que ambientes familiares y preescolares de más alta calidad conducen a resultados del desarrollo infantil más favorables.

Nivel Socio-Económico

Sabemos que niños de familias de niveles socio-económicos bajos y de grupos minoritarios están expuestos a riesgos múltiples en su trayectoria de

desarrollo (Evans, 2004; King, Smith, & Gracey, 2009; Williams, 1999). El Modelo de Inversión Familiar y el Modelo de Estrés Familiar ofrecen posibles explicaciones para las relaciones entre un NSE bajo y el desarrollo menos favorable del niño (Conger & Donnelaan, 2007). Según el Modelo de Inversión Familiar padres con menos recursos (en términos financieras, educacionales y ocupacionales) pueden invertir menos en su hijo (por ejemplo en términos de vivienda, alimentación, salud y materiales didácticos) que padres de familias acomodadas, que resulta a su vez en un desarrollo físico, cognitivo y socio-emocional menos positivo de sus hijos. El Modelo de Estrés Familiar describe qué dificultades socio-económicas conducen a una crianza de más baja calidad (por ejemplo, menos involucramiento parental y menos estimulación), la que a su vez se relaciona a un desarrollo menos favorable del niño. Estos modelos teóricos parecen especialmente relevantes para países en vías de desarrollo, donde condiciones de vida más pobres son muchas veces la norma. Chile merece especial atención en el contexto de pobreza y desarrollo infantil, porque es mundialmente uno de los países con más desigualdad socio-económica. La quinta parte de la población chilena vive en pobreza multidimensional (esto quiere decir no sólo insuficiente ingresos, sino también deficiencias en vivienda, salud, educación, trabajo y seguridad social) (CASEN, 2013b) y dos quintas partes de la población es socio-económicamente vulnerable. Esto significa que su ingreso mensual per cápita está abajo del sueldo mínimo de 264.000 CLP (US$ 400) (AIM, 2015). Preocupantemente, esta problemática social se traduce no sólo en ambientes familiares de más baja calidad para la mayoría de los niños chilenos, sino también en establecimientos escolares (educación parvularia, básica y media) de más baja calidad, porque el acceso a una educación de buena calidad está reservada a un porcentaje pequeño de familias influentes y privilegiadas (OCDE, 2015). Estudios sobre predictores del desarrollo cognitivo y socio-emocional de niños preescolares son especialmente relevantes para actores políticos y profesionales trabajando en primera infancia, porque pueden generar conocimientos valiosos sobre cómo apoyar el desarrollo de niños pertenecientes a familias en riesgo social.

Relevancia y Objetivo del Estudio Actual

Aunque las relaciones entre ambientes de socialización temprana y el desarrollo infantil han sido bien documentados en Europa y Norteamérica, se sabe poco sobre estas relaciones en el resto del mundo (Henrich, Heine,

& Norenzayan, 2010). Se ha investigado escasamente si las relaciones que se encuentran generalmente en países desarrollados se replican en Latinoamérica, un continente caracterizado por otro contexto cultural y socio-económico. Según nuestro conocimiento somos los primeros investigando el papel de los ambientes de socialización en el desarrollo cognitivo y socio-emocional de niños preescolares en Chile. Nos enfocamos en familias de niveles socio-económicos bajos de dos grupos étnicos: el grupo minoritario mapuche y el grupo mayoritario chileno. Los mapuches son el grupo minoritario más grande de Chile (9% de la población nacional) y componen un tercio de la población de la región Araucanía y un quinto de la región de los Lagos, donde se condujo este estudio. Generar conocimiento sobre estas relaciones es importante para prevenir o disminuir retrasos en el desarrollo de niños de familias en riesgo social. Para obtener un mejor entendimiento de crianza y educación en el contexto de Chile, comenzamos con una breve revisión histórica. En este libro nos concentramos en las siguientes preguntas de investigación:

1. Cuál es el contexto histórico-cultural de la crianza y educación en Chile?
2. En qué medida el NSE y la calidad del ambiente familiar están relacionados con el vocabulario receptivo y expresivo de niños preescolares en Chile?
3. En qué medida el NSE, la auto-eficacia maternal, estimulación cognitiva parental y disciplina apoyadora maternal están relacionados con la aptitud escolar (alfabetización temprana y matemática temprana) y las funciones ejecutivas de niños preescolares en Chile?
4. En qué medida las funciones ejecutivas y la calidad y cantidad de la crianza maternal y profesional (el ambiente familiar y preescolar) están relacionados con el desarrollo de problemas de conducta, el desarrollo del comportamiento prosocial y el desarrollo del lenguaje.

Antecedentes Histórico-Culturales de la Crianza Infantil y Educación en Chile

En el Capítulo 2 se da un breve resumen sobre los antecedentes histórico-culturales de la crianza y educación en Chile. Desde la implementación del sistema de haciendas por el poder colonial Español en Chile en el siglo 17, la estructura social de la colonia, y después de la República de Chile, se ha definido por dos clases: el patrón y peón. Los patrones eran los españoles o sus descendientes ('criollos') y los peones eran indígenas o mestizos.

Evidentemente, los hijos de los peones no tenían ninguna oportunidad en la vida y asumieron la posición social de sus padres. Mientras, los hijos de los patrones disfrutaron de educación superior (incluso a veces en Europa), para obtener posiciones de autoridad. El Chile actual todavía sufre intensamente las secuelas del colonialismo. La división social en dos clases es robusta. Chile es uno de los países con la brecha más grande entre ricos y pobres, y con menos movilidad social. Esto significa que la clase social en que nace un niño chileno determina el curso de su vida en una forma desproporcionada, comparada con otros países, porque las oportunidades de desarrollo, educación escolar y formación ocupacional dependen casi exclusivamente de la posición socio-económica de los padres. Distintos gobiernos de la República de Chile han intentado cambiar la estructura social del país a través de reformas educacionales. La primera Ley de Educación Primaria en 1860, por ejemplo, creó las bases para un sistema educacional público, gratuito y en teoría accesible para todos (niñas y niños, pobres y ricos). Sin embargo, 50 años después sólo un tercio de los niños chilenos asistía a la escuela y, por lo tanto, para remediar esta situación en 1920 se introdujo la Ley de Educación Primaria Obligatoria.

Durante los últimos 100 años Chile se ha esforzado por expandir la cobertura escolar en la educación parvularia, básica y media y ha luchado por mejorar la calidad de la educación. En 2015, 50 % de los niños chilenos entre 0 y 5 años asistieron a la educación parvularia, 96 % de los niños entre 6 y 13 asistieron a la enseñanza básica y 88 % de los adolescentes entre 14 y 17 asistieron a la enseñanza media. En el mismo año la tasa de alfabetismo alcanzó 97 %. Esto es un logro notable en el ámbito de la disponibilidad de educación, considerando que el territorio geográfico de Chile se extiende de norte a sur por más de 4.000 kilómetros. No obstante, la calidad de la educación y la desigualdad social siguen siendo un desafío enorme para el país. Cuarenta y cinco por ciento de los alumnos no logran obtener las habilidades básicas en lectura, matemática y ciencia medido con las pruebas de competencia PISA (Program for International Student Assessment). Chile tiene la tercera oferta más baja de educación pública de los países OCDE (38% comparado con el OCDE promedio de 82%), 48% de los colegios son particular subvencionados y 14% son particulares. En este contexto es notable mencionar que las universidades públicas en Chile cobran las segundas aranceles más altas para una licenciatura (US$ 7.654) de los países OCDE, sólo superado por los E.E.U.U. (US$ 8.202) según un informe de la OCDE (2017). Los aranceles de universidades privadas

en efecto no son mucho más bajos (US$ 7.156). El informe también muestra que solo 15% de los alumnos chilenos están matriculados en instituciones públicas de educación superior (comparado con el promedio OCDE de 68%). Los colegios públicos en Chile atienden a los alumnos de niveles socio-económicos más bajos, que tienen los puntajes más bajos en la prueba PISA y que, generalmente, no continúan con educación terciaria por falta de preparación académica y medios financieros. La triple división del sistema escolar es la fuerza propulsora tras la segregación social y desigualdad económica, e impide el cierre de la brecha entre las clases sociales. Chile también es el país de la OCDE en el cual menos alumnos superan la desventaja (el estigma) de pertenecer a la clase baja y rinden sobre las expectativas. Para combatir la inequidad social en el año 2007 el gobierno de Chile lanzó el programa *Chile Crece Contigo*. Este programa de primera infancia provee servicios de salud y educación parvularia gratuita para niños del 60% de hogares más pobres, desde el nacimiento hasta entrar a la enseñanza básica. Aún no se sabe el impacto de este programa, pero seguramente es un paso grande en la dirección correcta.

El Ambiente Familiar y el Desarrollo del Lenguaje

Estudios en países desarrollados demuestran que niños adquieren un vocabulario más grande si crecen en hogares con más estimulación lingüística y académica, si sus padres son más responsivos y materiales didácticos (libros y juguetes) apropiados para la edad del niño están a su disposición (e.g. Bus, Van IJzendoorn, & Pellegrini, 1995; Rodriguez & Tamis-LeMonda, 2011; Song, Spier, & Tamis-Lemonda, 2013). Según el Modelo de Inversión Familiar padres con un NSE más bajo pueden invertir menos en el desarrollo del lenguaje de su hijo (por ejemplo, no hay dinero para comprar libros y los padres no estimulan suficientemente a sus hijos porque ellos mismos tienen un nivel educativo bajo y no tienen conciencia sobre la importancia de la estimulación temprana). Por lo tanto, niños de familias de bajos recursos tienen más riesgo de desarrollar un retraso de lenguaje (Hoff, 2006; Huston et al., 2005).

El papel del NSE y de la calidad del ambiente familiar en predecir el desarrollo del vocabulario receptivo y expresivo de niños preescolares (de tres años y medio) en Chile se investigó en el Capítulo 3 de este libro. La calidad del ambiente familiar se midió a 6, 15 y 42 meses a través de observaciones del hogar y entrevistas con el cuidador principal. Setenta y siete padres llenaron cuestionarios a los 42 meses en cual reportaron su NSE. Al mismo

tiempo se midió el vocabulario receptivo y expresivo de sus hijos con pruebas estandarizados de lenguaje. Los resultados mostraron que, después de haber controlado por etnia, NSE, estatus parental y cantidad de asistencia parvularia, la calidad del ambiente familiar durante la infancia temprana estuvo positivamente asociada con el vocabulario receptivo y expresivo de niños preescolares. Niños en hogares de más alta calidad desarrollaron un mayor vocabulario. Además se encontró un efecto indirecto del NSE sobre el vocabulario receptivo y expresivo a través de la calidad del ambiente familiar. Madres con un NSE más bajo proveyeron un ambiente familiar menos enriquecedor (por ejemplo, entregan menos estimulación cognitiva y mostraron menos responsividad y hay menos materiales didácticos disponibles en el hogar), que se relacionó con una menor adquisición de vocabulario de sus hijos. Estos hallazgos están de acuerdo con estudios realizados en países desarrollados y confirman la aplicabilidad del Modelo de Inversión Familiar en el contexto latinoamericano de Chile. Señalamos igualmente que este modelo teórico se puede aplicar dentro de una población de un NSE bajo, que sugiere que incluso incrementos marginales en NSE pueden beneficiar la calidad del ambiente familiar y el desarrollo del lenguaje del niño. Nuestros resultados recalcan el papel crucial del ambiente familiar para predecir diferencias individuales en el desarrollo del vocabulario en niños preescolares (Conger & Donnellan, 2007). Padres estimuladores y responsivos pueden mitigar los efectos adversos de NSE bajos sobre el desarrollo de su hijo.

Crianza y Aptitud Escolar

Diversos teorías y estudios indican que las creencias parentales y prácticas de crianza juegan un papel fundamental en el desarrollo de la aptitud escolar (alfabetización temprana y matemática temprana) y de las funciones ejecutivas de niños preescolares (Ainsworth, 1985; Baumrind, 1971; Bandura, 1993; Caldwell & Bradley, 2003). La literatura científica de países desarrollados indica una relación indirecta entre la auto-eficacia de padres y el rendimiento escolar de sus hijos a través de las prácticas de crianza (Ardelt & Eccles, 2001; Jones & Prinz, 2005; Pelletier & Brent, 2002; Waanders, Mendez, & Downer, 2007). Los estudios, además, documentan que prácticas de crianza como la estimulación cognitiva y la disciplina apoyadora están positivamente relacionados con aptitud escolar (Chazan-Cohen et al., 2009; Mistry, Benner, Biesanz Clark, & Howes, 2010; Melhuish, Phan, Sylva, Sammons, Siraj-Blatchford, Taggart, 2008) y las

funciones ejecutivas de niños preescolares (Clark et al., 2013; Hackman, 2012; NICHD EECRN, 2005; Rhoades, Greenberg, Lanza, & Blair, 2011).

El papel del NSE, de la auto-eficacia parental y de las prácticas de crianza, en predecir la aptitud escolar y de las funciones ejecutivas en niños preescolares (5 años) se investigó en el Capítulo 4 de este libro. Setenta madres rellenaron cuestionarios sobre su auto-eficacia percibida cuando su hijo tenía 42 y 61 meses de edad. En el mismo instante se midió la estimulación cognitiva a través de observaciones del hogar y entrevistas con las madres. Cuando los niños tenían 42 meses se evaluó la disciplina apoyadora de la madre observando el comportamiento de madre e hijo durante una tarea de interacción. La aptitud escolar y las funciones ejecutivas de los niños se midieron con pruebas de rendimiento a los 61 meses. Los resultados señalan que, después de haber controlado por NSE y etnia, mayor disciplina apoyadora de la madre a los 42 meses predijo una mayor aptitud escolar de sus hijos a los 61 meses. Además se encontró un efecto indirecto del NSE sobre la aptitud escolar a través de la disciplina apoyadora. Madres de un NSE bajo proveyeron menos disciplina apoyadora y sus hijos a su vez desarrollaron menos habilidades de aptitud escolar. Estos hallazgos agregan apoyo empírico al Modelo de Estrés Familiar e indican que las consecuencias negativas de un NSE bajo sobre el desarrollo infantil se pueden explicar parcialmente por las prácticas de crianza de los padres. Más dificultades económicas conducen, según el Modelo de Estrés Familiar, a problemas emocionales y conductuales de los padres, los que a su vez resultan en una calidad de crianza más baja. Nuestro estudio demuestra concluyentemente que los padres tienen un papel clave en la adquisición de la aptitud escolar de sus hijos y que la disciplina apoyadora puede mitigar los efectos adversos de un NSE bajo.

Socialización y Desarrollo Preescolar

Además de los ambientes de socialización, las funciones ejecutivas (FEs) son cruciales para el desarrollo socio-emocional de niños preescolares. Estudios en países desarrollados han mostrado que déficits en las FEs están relacionados a problemas de externalización e internalización en niños (Hughes & Ensor, 2011; Schoemaker, Mulder, Deković, & Matthys, 2013). FEs están positivamente asociadas a comportamiento prosocial y al desarrollo del lenguaje (Brock, Rimm-Kaufman, Nathanson, & Grimm, 2009; Weiland, Barata, & Yoshikawa, 2014; Yeates et al, 2007). Además la literatura científica

de los países desarrollados señala que ambientes de socialización (el hogar y el establecimiento de educación parvularia) de más alta calidad durante la primera infancia están relacionados a menos problemas conductuales, más comportamiento prosocial y un desarrollo del lenguaje más favorable (NICHD ECCRN, 2001; NICHD ECCRN, 2003a; NICHD ECCRN, 2004).

El papel de las FEs y la calidad y cantidad de la crianza en el ambiente familiar y educativo, en predecir problemas de conducta, comportamiento prosocial y el desarrollo del lenguaje se investigó en niños preescolares de 5 años (Capítulo 5). Setenta y siete madres rellenaron cuestionarios sobre los problemas de conducta y el comportamiento prosocial de su hijo y sobre la cantidad de cuidado materno. La calidad del ambiente familiar se midió a los 6, 15, 42 y 61 meses a través de observaciones del hogar y entrevistas con la madre. La calidad del ambiente preescolar (niveles de transición) se evaluó a los 61 meses a través de observación del aula y entrevistas con las educadoras. La cantidad de la asistencia a la educación parvularia entre los 6 y 61 meses se registró con la ayuda de bases de datos digitales de JUNJI e INTEGRA y la revisión de los libros del curso en caso de que no existiera la información digitalizada (como fue el caso en la isla de Chiloé). A los 61 meses se midió el vocabulario receptivo y expresivo de los niños con pruebas estandarizados de lenguaje. Los resultados muestran que las FEs y la calidad del ambiente familiar estuvieron positivamente relacionados con el desarrollo del lenguaje. No se encontraron predictores del desarrollo socio-emocional. Estos hallazgos confirman el papel importante de las FEs y de una crianza estimuladora y responsiva para el desarrollo del lenguaje en un contexto latinoamericano.

Además nuestros resultados revelaron que la calidad de los 61 aulas preescolares (niveles de transición) observadas fue inadecuada. Esto significa que el cuidado no era personalizado (no ajustado individualmente al niño) y que las necesidades básicas del cuidado y del desarrollo de los niños no fueron satisfechas según el estándar del *Early Childhood Environment Rating Scale* (Harms, Clifford, & Cryer, 1998). En este contexto es destacable que nuestros resultados del sur de Chile (Región de La Araucanía y Región de Los Lagos) con respecto a la calidad de la educación preescolar han sido notablemente menos positivos que lo que otros estudios chilenos indicaron: en la Región Metropolitana y en la Región del Bío Bío se encontró una calidad mínima (Herrera et al, 2005; Villalón, Suzuki, Herrera, & Mathiesen, 2002). La calidad baja de la educación preescolar podría explicar parcialmente, porque niños

que pasaron más tiempo en establecimientos educativos mostraron menos desarrollo del lenguaje que niños que pasaron menos tiempo en los mismos. Esto es un resultado preocupante especialmente en el contexto de niños de familias en riesgo social, porque se esperaría que la educación parvularia compense por la falta de estimulación en el hogar y brinde una oportunidad para los niños vulnerables de recuperar su desarrollo desfavorecido, en lugar de agravar retrasos en el desarrollo.

Conclusión

Los hallazgos de esta investigación confirman la importancia de los procesos de crianza para el desarrollo infantil en un contexto latinoamericano. Tal como en muestras de países desarrollados, la estimulación cognitiva y responsividad en el ambiente familiar y la sensitividad materna estuvieron relacionados con resultados del desarrollo más positivos: niños que crecieron durante sus primeros años en ambientes familiares más estimuladores cognitivamente y más responsivos, mostraron un mayor desarrollo del lenguaje durante la edad preescolar y niños cuyos madres proveyeron más disciplina apoyadora alcanzaron mayores niveles de aptitud escolar en los niveles de transición. Acorde con el Modelo de Inversión Familiar y el Modelo de Estrés Familiar encontramos que el NSE influye sobre el desarrollo del lenguaje y la aptitud escolar indirectamente a través de procesos de crianza (la calidad del ambiente familiar y la provisión de disciplina apoyadora). Esto sugiere que el mejoramiento de prácticas de crianzas parentales puede ser una manera efectiva para mitigar los efectos adversos de un NSE bajo. En nuestro conocimiento somos los primeros investigadores en confirmar la operación de estos mecanismos dentro de la familia en una muestra de dos grupos étnicos (mapuche indígena y chilenos) en el sur de Chile. En este contexto es importante notar, que no encontramos diferencias culturales entre familias mapuches y chilenas.

Además, encontramos fundamento para destacar el rol importante de las FEs en el desarrollo del lenguaje en niños preescolares. Finalmente, de nuestro estudio se concluye que la calidad de la educación preescolar en nuestra muestra – casi igualmente distribuida entre colegios públicos y particulares subvencionados – fue inadecuada. La baja calidad de la educación preescolar es alarmante, porque significa que una gran cantidad de niños preescolares en Chile comienzan la enseñanza básica sin las habilidades cognitivas y socio-emocionales básicas necesarias para una trayectoria escolar exitosa. Más

aún, la baja calidad de la educación preescolar es un riesgo adicional a la baja calidad de crianza en el hogar, para el surgimiento de retrasos en el desarrollo de niños socio-económicamente vulnerables, y contribuye a la ampliación de la brecha de rendimiento y a la perpetuación intergeneracional de la pobreza. Este estudio recalca la necesidad urgente de mejorar la calidad de la educación preescolar en Chile, para que cada niño tenga acceso a educación de calidad (y no sólo los niños de familias privilegiadas) como catalizador para reducir las desigualdades sociales. Finalmente, resaltamos la importancia de invertir en la educación y capacitación de actuales y futuros padres, educadores y profesores con el fin de hacerles conscientes del papel clave que tienen en el desarrollo y bienestar de los niños, y de equiparles con los conocimientos y competencias necesarias para poder entregar crianza de calidad.

Nederlandse Samenvatting (Summary in Dutch)

Deze dissertatie beschrijft de tweede fase van de longitudinale *Magallan-Leiden Childcare Study*, die in 2012 is gestart met 110 moeders en hun baby's, die tussen mei en oktober 2011 werden geboren (Cárcamo, Vermeer, Van der Veer, & Van IJzendoorn, 2015). De steekproef werd in het zuiden van Chili geworven (Araucanía regio en Lagos regio) en bestond uit gezinnen met een lage socio-economische status (SES), afkomstig uit twee etnische groepen: de Mapuche minderheidsgroep (inheemse bevolking) en de Chilenen meerderheidsgroep. De focus van de eerste onderzoeksfase (Tijd 1 op 6 maanden en Tijd 2 op 15 maanden) lag op de opvoedingsomgeving en sociaal-emotionele ontwikkeling in de babytijd. Tijdens de tweede onderzoeksfase richten wij ons op de bijdrage van de opvoedingsomgeving op de cognitieve en sociaal-emotionele ontwikkeling van kinderen tijdens de voorschoolse leeftijd (Tijd 3 op 42 maanden en Tijd 4 op 61 maanden). In deze dissertatie wordt onderzocht in hoeverre SES, etniciteit, en opvoeding thuis en in een professionele setting (kinderopvang, kleuterschool) samenhangen met executieve functies, schoolrijpheid (beginnende geletterdheid en beginnende gecijferdheid), taalontwikkeling, probleemgedrag en prosociaal gedrag van kinderen van 3 ½ (peuters) en 5 jaar (kleuters).

Voorschoolse Ontwikkeling

De voorschoolse leeftijd wordt gekenmerkt door grote vooruitgang op het vlak van de cognitieve en sociaal-emotionele ontwikkeling. De receptieve en expressieve woordenschat nemen sterk toe (Carey, 1978; Slobin, 1978), evenals essentiële schoolrijpheidsvaardigheden zoals beginnende geletterdheid (fonologisch bewustzijn, kennis van het alfabet, *early reading*, en *early writing*) en beginnende gecijferdheid (cijferherkenning en begrip van getallen) (Jordan, Kaplan, Locuniak, & Ramineni, 2007; Purpura, 2009; Whitehurst & Lonigan, 1998). Naarmate de prefrontale cortex rijpt, ontwikkelen de executieve functies (EFs). Kinderen zijn op deze leeftijd al toenemend in staat om informatie te onthouden, impulsen te beheersen, van perspectief te veranderen en hun gedrag te reguleren (Diamond, 2002). Op het sociaal-emotionele gebied wordt ook vooruitgang geboekt: Kinderen leren geleidelijk aan prosociaal gedrag (bijvoorbeeld empathie, coöperatie, helpen en delen) en de regulatie van hun emoties (Eisenberg, 2003; Bridges, Denham, & Ganiban, 2004). De ontplooiing

van kinderen binnen deze domeinen, tijdens de voorschoolse leeftijd, legt de basis voor hun latere ontwikkelingstrajecten en is medeverantwoordelijk voor hun fysieke en mentale gezondheid, sociaal functioneren en toekomstig succes op school en werk (Diamond, 2013; Duncan et al., 2007).

Vroege Socialisatie

De vooruitgang in deze ontwikkelingsdomeinen hangt mede af van socialisatieprocessen in de omgeving van het kind en contextuele factoren zoals de SES en de culturele achtergrond van het gezin. In Chili gaan 90% van de 4 en 5 jarige kinderen naar een kleuterschool (CASEN, 2015), wat vergelijkbaar is met groep 1 en 2 in Nederland. Negenentwintig percent van de 0- tot 3-jarige kinderen gaan naar de kinderopvang. Bijgevolg zijn de thuisomgeving en de kinderopvang of kleuterschool de meest invloedrijke socialisatieomgevingen voor kinderen in de voorschoolse leeftijd. Een positieve thuisomgeving wordt gekenmerkt door het bieden van rijke en gevarieerde leerervaringen (bijvoorbeeld beschikbaarheid van boeken en speelgoed, cultuur en uitstapjes), cognitieve stimulatie, interpersoonlijke warmte en responsiviteit (Caldwell & Bradley, 2003) en ondersteunende discipline (Ainsworth, 1985; Baumrind, 1971). Dit laatste houdt in dat ouders sensitief reageren op de signalen van hun kind en het gedrag van hun kind op een positieve manier kunnen reguleren (door bijvoorbeeld consequente regels en grenzen, duidelijke uitleg en zo nodig afleiding). Opvoeding wordt ook beïnvloed door *self-efficacy*, dat wil zeggen de opvattingen of oordelen die ouders hebben over hun vermogen om bepaalde opvoedingstaken te organiseren en uit te voeren (Monigny, 2005). De opvattingen die ouders hebben beïnvloeden de opvoeding door cognitieve, affectieve en selectieprocessen (Bandura, 1993, Montigny & Lacharité, 2005). Een positieve kinderopvang- en kleuterschoolomgeving wordt gekenmerkt door een adequate fysieke infrastructuur (bijvoorbeeld veiligheid, voldoende ruimte, verwarming en beschikbaarheid van boeken, speelgoed en leermaterialen), een variëteit aan fysieke, cognitieve, linguïstische en creatieve stimulatie, positief disciplineren en warme sociale interacties met pedagogische medewerkers en leeftijdsgenoten (Harms, Clifford, & Cryer, 1998; NICHD, 2005). Onderzoek toont consistent aan dat thuis- en kleuterschoolomgevingen van hogere kwaliteit tot gunstigere ontwikkelingsuitkomsten bij kinderen leiden (Bradley & Corwyn, 2005; Burchinal & Cryer, 2004).

Sociaal-Economische Status

Uit onderzoek is bekend dat kinderen van gezinnen met lage SES en een minderheidsgroep status aan meer risico's zijn blootgesteld dan kinderen van gezinnen met een hogere SES en meerderheidsgroep status (Evans, 2004; King, Smith, & Gracey, 2009; Williams, 1999). Het *Family Investment Model* en het *Family Stress Model* geven mogelijke verklaringen voor de relaties tussen lage SES en een minder positieve ontwikkeling van het kind (Conger & Donnelaan, 2007). Volgens het *Family Investment Model* kunnen ouders met minder middelen en mogelijkheden (qua financiële, opleidings- en beroepsachtergrond) minder in hun kind investeren (bijvoorbeeld wat betreft huisvesting, voedsel en leermateriaal) dan ouders van welgestelde gezinnen, wat tot een minder gunstige ontwikkeling van het kind leidt. Het *Family Stress Model* beschrijft dat sociaal-economische moeilijkheden tot opvoeding van lagere kwaliteit leiden (bijvoorbeeld minder betrokkenheid en stimulatie), die vervolgens samenhangt met een minder positieve ontwikkeling van het kind. Deze modellen lijken bijzonder relevant in niet-Westerse landen, waar armere levensomstandigheden vaak de norm zijn. Vroege ontwikkeling van kinderen in de context van armoede vraagt om speciale aandacht in Chili, want het is wereldwijd één van de landen met de meeste sociaal-economische ongelijkheid. Een vijfde van de nationale bevolking in Chili leeft in multidimensionale armoede (d.w.z. niet alleen onvoldoende inkomen, maar ook beperkingen wat betreft huisvesting, gezondheid, onderwijs, werk, en sociale zekerheid) (CASEN, 2013b) en twee vijfde van de bevolking is sociaal-economisch kwetsbaar, wat betekent dat hun maandelijkse per capita inkomen onder het minimumloon van US$ 400 ligt (AIM, 2015). Deze verontrustende maatschappelijke problematiek vertaalt zich niet alleen naar een lagere kwaliteit van de thuisomgeving voor de meerderheid van de Chileense kinderen, maar ook naar een lagere kwaliteit van kinderdagverblijven en (kleuter)scholen, omdat onderwijsvoorzieningen met een hoge kwaliteit vaak alleen toegankelijk zijn voor een klein percentage van bevoorrechte gezinnen (OECD, 2015). Onderzoek naar predictoren van de cognitieve en sociaal-emotionele ontwikkeling van kinderen tijdens de voorschoolse periode is bijzonder relevant voor beleidsvormers en jeugdhulpverleners in Chili, omdat het waardevolle inzichten kan opleveren over mogelijkheden om de ontwikkeling van kinderen uit risicogezinnen te ondersteunen.

Relevantie en Doelstelling Huidig Onderzoek

Hoewel uitgebreid onderzoek verricht is naar de samenhangen tussen vroege socialisatieomgevingen van kinderen en hun ontwikkelingsuitkomsten in Westerse landen, is hierover nog maar weinig bekend in niet-Westerse landen (Henrich, Heine, & Norenzayan, 2010). Zo is nog nauwelijks eerder onderzocht of de samenhangen die over het algemeen in Westerse landen worden gevonden gerepliceerd kunnen worden in Latijns-Amerika, dat wil zeggen in een andere culturele en sociaal-economische context. Voor zover wij kunnen nagaan zijn wij de eersten die de rol van de socialisatieomgevingen in de cognitieve en sociaal-emotionele ontwikkeling van kinderen in de voorschoolse leeftijd in Chili onderzoeken. Wij concentreren ons op lage SES gezinnen afkomstig uit twee etnische groepen: een Mapuche minderheidsgroep en een Chileense meerderheidsgroep. De Mapuche vormen de grootste minderheidsgroep in Chili (9% van de nationale bevolking) en maken een derde uit van de bevolking van de Araucanía regio en een vijfde van de bevolking van de Lagos regio, waar dit onderzoek is verricht. Inzicht in deze samenhangen kan belangrijke informatie opleveren, zodat ontwikkelingsachterstanden in sociale risicogroepen voorkomen kunnen worden. Om een beter begrip te krijgen over opvoeding en onderwijs in de context van Chili, schetsen wij eerst de relevante cultuur-historische achtergrond. In dit proefschrift staan de volgende onderzoeksvragen centraal:

1. Wat zijn de cultuur-historische achtergronden van opvoeding en onderwijs in Chili?
2. In hoeverre zijn SES en de kwaliteit van de thuisomgeving gerelateerd aan de receptieve en expressieve woordenschat van peuters in Chili?
3. In hoeverre zijn SES, *self-efficacy*, cognitieve stimulatie en ondersteunende discipline gerelateerd aan schoolrijpheid (beginnende geletterdheid en gecijferdheid) en EFs bij kleuters in Chili?
4. In hoeverre zijn EFs en de kwaliteit en kwantiteit van de opvoeding (thuis en kinderopvang/kleuterschool) gerelateerd aan de ontwikkeling van gedragsproblemen, prosociaal gedrag en taalvaardigheden van kleuters in Chili?

Cultuur–Historische Achtergronden van Opvoeding en Onderwijs in Chili

In Hoofdstuk 2 wordt een kort historisch overzicht gegeven van de cultuur-historische achtergronden van opvoeding en onderwijs in Chili. Sinds de invoering van het *hacienda* systeem (boerderij met grootgrondbezit) door de Spaanse koloniale macht in Chile in de 17e eeuw werd de sociale structuur van de kolonie en daarna van de Republiek Chili voor langer dan drie eeuwen bepaald door twee klassen: de meester (*patrón*) en de knecht (*peón*). De meesters waren de Spanjaarden of hun nakomelingen (*'criollos'*) en de knechten of slaven de inheemse bevolking of mestiezen. Vanzelfsprekend hadden kinderen van de knechten helemaal geen kansen in het leven en namen later de sociale positie van hun ouders over, terwijl de kinderen van de meester hoger onderwijs (soms zelf in Europa) genoten, om later de autoriteitsposities te verkrijgen. Het Chili van tegenwoordig lijdt nog steeds onder heftige naweeën van het kolonialisme. De twee klassen maatschappij is robuust. Chili is een van de landen met de grootste kloof tussen arm en rijk en de minste sociale mobiliteit. De sociale klasse waarin kinderen worden geboren is erg bepalend voor hun toekomst, want ontwikkelings-, onderwijs-, en opleidingskansen van kinderen hangen sterk af van de sociaal-economische positie van hun ouders. Verschillende regeringen van de Republiek Chili hebben geprobeerd veranderingen aan te brengen in de sociale structuur van het land door diverse onderwijshervormingen. Zo legde de eerste Algemene Wet van Basisonderwijs in 1860 bijvoorbeeld de basis voor een openbaar schoolsysteem, dat kostenvrij was en in theorie voor iedereen (meisjes en jongens, arm en rijk) toegankelijk was. Vijftig jaar later ging echter nog maar slechts een derde van de Chileense kinderen naar school en daarom werd de Wet van Verplicht Basisonderwijs ingevoerd in 1920.

In de afgelopen honderd jaar heeft Chili geworsteld met de uitbreiding van voorschoolse, basis- en middelbare schoolvoorzieningen en met het verbeteren van de kwaliteit van het onderwijs. In 2015 gingen 50% van de Chileense kinderen tussen 0 en 5 jaar naar een vorm van kinderopvang of kleuterschool, 96% van de 6 tot 13 jarigen naar een basisschool en 88% van de 14 tot 17 jarigen naar een middelbare school. In hetzelfde jaar was de alfabetiseringsgraad van Chili bijna 97%. Dat is een aanzienlijke prestatie op het gebied van kwantiteit van beschikbaar onderwijs gezien de grootte van Chili (meer dan 4.000 km lengte), maar de kwaliteit van het onderwijs en de sociale ongelijkheid blijven een enorme uitdaging voor het land. Vijfenveertig percent van de scholieren

halen niet de basisvaardigheden op de PISA (Program for International Student Assessment) bekwaamheidstest in lezen, wiskunde en wetenschap. Chili heeft op twee OECD landen na het laagste openbare schoolaanbod (38% vergeleken met het OECD gemiddelde van 82%), 48% zijn overheid-gesubsidieerde particuliere scholen en 14 % zijn particuliere scholen. In deze context is het noemenswaardig dat de openbare Chileense universiteiten het hoogste collegegeld (US$ 7 654) eisen voor een bacheloropleiding van alle OECD landen met uitzondering van de Verenigde Staten (US$ 8,202) volgens een OECD rapport (OECD, 2017). Slechts 15% van de Chileense studenten gaat naar een openbare universiteit; het collegegeld op particuliere universiteiten is echter niet veel minder (US$ 7,156). Openbare scholen in Chili worden bezocht door leerlingen van lagere SES achtergronden, die ook lagere PISA scores halen vergeleken met leerlingen van particuliere scholen en over het algemeen niet doorstromen naar tertiair onderwijs (zowel door gebrekkige vooropleiding als ook door gebrek aan financiële middelen). De driedeling van het schoolsysteem is de drijvende kracht achter de sociale segregatie en economische ongelijkheid en belemmert systematisch de sluiting van de kloof tussen de sociale klassen. Chili is ook het OECD land waar de minste scholieren het stigma van hun lage sociaal-economische klasse overwinnen en boven verwachtingen presteren. Om de sociale ongelijkheid tegen te gaan heeft Chili in 2007 het programma *Chili Groeit Met Jou* (Chile Crece Contigo) gestart. Het voorziet de kinderen van de 60% armste huishoudens met gratis medische zorg, kinderopvang en kleuteronderwijs van hun geboorte tot het begin van het basisonderwijs. De kwalitatieve impact van dit programma is nog niet bekend, maar het is zeker een stap in de goede richting.

Thuisomgeving en Taalontwikkeling

Eerder onderzoek in Westerse landen toont aan dat kinderen een grotere woordenschat verwerven als ze opgroeien in een thuis met meer linguïstische en academische stimulatie, hun ouders meer responsief zijn en leeftijdsadequate leermaterialen (boeken en speelgoed) beschikbaar zijn in huis (e.g. Bus, Van IJzendoorn, & Pellegrini, 1995; Rodriguez & Tamis-LeMonda, 2011; Song, Spier, & Tamis-Lemonda, 2013). Volgens het *Family Investment Model* kunnen ouders met lagere SES minder investeren in de taalontwikkeling van hun kind (bv. er is geen geld voor boeken en kinderen worden minder cognitief gestimuleerd, omdat de ouders zelf laag opgeleid zijn en niet voldoende

kennis hebben). Daarom lopen kinderen uit lage SES gezinnen meer kans op taalachterstand (Hoff, 2006; Huston et al., 2005).

De rol van SES en de kwaliteit van de thuisomgeving bij het voorspellen van de ontwikkeling van de receptieve en expressieve woordenschat van Chileense peuters (3½ jaar) werd in Hoofdstuk 3 onderzocht. De kwaliteit van de thuisomgeving werd op 6, 15 en 42 maanden gemeten door observaties en interviews met de primaire opvoeder. Zevenenzeventig ouders vulden op 42 maanden een vragenlijst in, waarin ze onder andere hun SES rapporteerden. Op hetzelfde tijdstip werd de receptieve en expressieve woordenschat van hun kinderen gemeten met gestandaardiseerde taaltoetsen. De resultaten lieten zien dat, na controle voor etniciteit, SES, ouderschapsstatus en kwantiteit van kinderopvang, de kwaliteit van de thuissituatie tijdens de vroege kindertijd positief samenhing met de receptieve en expressieve woordenschat van peuters. Bovendien bleek SES een indirect effect te hebben op de receptieve en expressieve woordenschat via de kwaliteit van de thuisomgeving. Moeders met lage SES boden een minder rijke thuisomgeving (bijvoorbeeld toonden minder cognitieve stimulatie en minder responsiviteit en er is minder leermateriaal beschikbaar), wat samenhing met een lagere woordenschat van hun kinderen. Deze bevindingen komen overeen met Westers onderzoek en bevestigen de toepasbaarheid van het *Family Investment Model* in de Latijns-Amerikaanse context van Chili. Daarnaast laten wij zien dat dit theoretische model ook binnen een lage SES populatie toegepast kan worden, wat suggereert dat zelfs een minimale toename van SES positief kan uitwerken op de kwaliteit van de thuisomgeving en de taalontwikkeling van het kind. Onze resultaten onderstrepen de cruciale rol van de thuisomgeving bij het voorspellen van individuele verschillen in de woordenschatontwikkeling bij kinderen in de voorschoolse leeftijd (Conger & Donnellan, 2007). Stimulerende en responsieve ouders kunnen een beschermende factor vormen tegen het negatieve effect van lage SES op de ontwikkeling van hun kind.

Opvoeding en Schoolrijpheid

Verschillende theorieën en studies wijzen erop dat opvattingen van ouders en opvoedingspraktijken een belangrijke rol spelen in de ontwikkeling van schoolrijpheid (beginnende geletterdheid en beginnende gecijferdheid) en EFs van kleuters (Ainsworth, 1985; Baumrind, 1971; Bandura, 1993; Caldwell & Bradley, 2003). De Westerse literatuur toont aan dat er een indirecte

relatie is tussen *self-efficacy* van ouders en schoolprestatie van het kind via opvoedingspraktijken (Ardelt & Eccles, 2001; Jones & Prinz, 2005; Pelletier & Brent, 2002; Waanders, Mendez, & Downer, 2007). Onderzoek in Westerse landen rapporteert verder dat opvoedingspraktijken zoals cognitieve stimulatie en ondersteunende discipline positief samenhangen met schoolrijpheid (Chazan-Cohen et al., 2009; Mistry, Benner, Biesanz Clark, & Howes, 2010; Melhuish, Phan, Sylva, Sammons, Siraj-Blatchford, Taggart, 2008) en EFs (Clark et al., 2013; Hackman, 2012; NICHD EECRN, 2005; Rhoades, Greenberg, Lanza, & Blair, 2011) van kleuters.

De rol van SES, *self-efficacy* en opvoedingspraktijken (cognitieve stimulatie en ondersteunende discipline) bij het voorspellen van schoolrijpheid en EFs bij kleuters (5 jaar) werd in Hoofdstuk 4 onderzocht. Zeventig moeders vulden een vragenlijst in over hun self-efficacy percepties toen hun kind 42 en 61 maanden oud was. Op dezelfde tijdstippen werd cognitieve stimulatie gemeten door observaties en interviews met de moeders. Toen de kinderen 42 maanden oud waren werd ondersteunende discipline gemeten door het gedrag van moeder en kind tijdens een interactie-taak te observeren. De schoolrijpheid en EFs van de kinderen werd op een prestatietaak gemeten toen deze 61 maanden oud waren. De resultaten tonen aan dat, na controle van SES en etniciteit, meer ondersteunende discipline door de moeder op 42 maanden een hoger niveau van schoolrijpheid van hun kinderen op 61 maanden voorspelde. Bovendien bleek SES een indirect effect op schoolrijpheid te hebben via ondersteunende discipline. Lage SES moeders boden minder ondersteunende discipline en hun kinderen toonden ook minder schoolrijpheid. Deze bevindingen ondersteunen het Family Stress Model en laten zien dat de negatieve gevolgen van lage SES op de ontwikkeling van het kind voor een deel verklaard kunnen worden door de opvoedingspraktijken van de ouders. Meer economische moeilijkheden leiden volgens het *Family Stress Model* tot emotionele en gedragsproblemen van de ouders, die op hun beurt tot lagere opvoedingskwaliteit leidt. Concluderend geeft ons onderzoek aan dat ouders een sleutelrol spelen bij de verwerving van de schoolrijpheid van hun kinderen en dat ondersteunende discipline de negatieve effecten van lage SES kan afzwakken.

Socialisatie en Voorschoolse Ontwikkeling

Naast de socialisatieomgevingen zijn EFs cruciaal voor de cognitieve en socio-emotionele ontwikkeling van kleuters. Onderzoek in Westerse landen

heeft laten zien dat tekorten in EFs gerelateerd zijn aan externaliserend en internaliserend probleemgedrag van kinderen (Hughes & Ensor, 2011; Schoemaker, Mulder, Deković, & Matthys, 2013). EFs zijn ook positief geassocieerd met prosociaal gedrag en taalvaardigheden (Brock, Rimm-Kaufman, Nathanson, & Grimm, 2009; Weiland, Barata, & Yoshikawa, 2014; Yeates et al, 2007). Daarnaast rapporteert de Westerse literatuur dat socialisatieomgevingen van hogere kwaliteit, zowel thuis als in de kinderopvang en kleuterschool, gerelateerd zijn aan minder probleemgedrag, meer prosociaal gedrag en een positievere taalontwikkeling (NICHD ECCRN, 2001; NICHD ECCRN, 2003a; NICHD ECCRN, 2004).

De rol van EFs en de kwaliteit en kwantiteit van opvoeding thuis en in de kinderopvang en kleuterschool bij het voorspellen van probleemgedrag, prosociaal gedrag en taalvaardigheden van kleuters (5 jaar) werd in Hoofdstuk 5 onderzocht. Zevenenzeventig moeders vulden een vragenlijst in over het probleemgedrag en prosociale gedrag van hun kind en de hoeveelheid zorg die zij boden voor hun kind. De kwaliteit van de thuisomgeving werd op de leeftijd van 6, 15, 42 en 61 maanden gemeten door observatie en interview met de moeder. De kwaliteit van de kleuterschool werd op 61 maanden gemeten door observatie en interview met de leerkracht van de kleuterklas. De hoeveelheid kinderopvang en kleuteronderwijs van 6 tot 61 maanden werd in kaart gebracht door de aanwezigheid per dag van ieder kind te noteren uit het klassenboek of uit de digitale databases van JUNJI en INTEGRA. Op 61 maanden werd de receptieve en expressieve woordenschat van hun kinderen gemeten met gestandaardiseerde taaltoetsen. De resultaten lieten zien dat EFs en de kwaliteit van de thuissituatie positief samenhingen met taalvaardigheden, en dat de hoeveelheid kinderopvang negatief samenhing met taalvaardigheden. Er werden geen significante voorpellers gevonden van socio-emotionele ontwikkeling. Deze resultaten bevestigen de belangrijke rol die EFs en een stimulerende en responsieve opvoeding spelen bij het ontwikkelen van taalvaardigheden in een Latijns-Amerikaanse context.

Bovendien lieten onze resultaten zien dat de kwaliteit van de 61 geobserveerde kleuterklassen inadequaat was. Dit betekent dat er sprake was van onpersoonlijke zorg (niet afgestemd op het individuele kind) en van een gebrek aan basale verzorgings- en ontwikkelingsbehoeften van de kinderen volgens de standaard van de *Early Childhood Environment Rating Scale* (Harms, Clifford, & Cryer, 1998). In deze context is het noemenswaardig dat onze resultaten uit

het zuiden van Chili (Araucanía regio en Lagos regio) met betrekking tot de kwaliteit van de kleuterscholen aanzienlijk minder positief waren dan andere Chileense studies aantoonden: in de Metrapolitana regio en in de BioBio regio werd minimale kwaliteit gevonden (Herrera et al, 2005; Villalón, Suzuki, Herrera, & Mathiesen, 2002). De lage kwaliteit van het kleuteronderwijs zou deels kunnen verklaren waarom kinderen die meer tijd in de kinderopvang en kleuterschool doorbrengen minder taalvaardigheden vertonen dan kinderen die minder tijd op de kinderopvang en kleuterschool zaten. Dit resultaat verrast negatief vooral in de context van kinderen uit sociale risicogezinnen, omdat je zou verwachten dat de kinderopvang of kleuterschool compenseert voor de lage kwaliteit van de thuisomgeving en de lage SES kinderen een kans zou geven, om hun ontwikkelingsachterstanden iets weg te kunnen werken.

Conclusie

De bevindingen in dit proefschrift bevestigen de belangrijke rol van opvoedingsprocessen voor de ontwikkeling van kinderen in een nieuwe Latijns-Amerikaanse context. Net als in Westerse steekproeven, bleek in Chili cognitieve stimulatie en responsiviteit in de thuisomgeving en sensitiviteit van de moeder gerelateerd te zijn aan positievere ontwikkelingsuitkomsten: Kinderen die tijdens hun eerste jaren opgroeiden in een meer cognitief stimulerende en responsieve thuisomgeving lieten meer taalvaardigheden zien op voorschoolse leeftijd en kinderen wiens moeders meer ondersteunende discipline boden toonden een hoger niveau van schoolrijpheid op de kleuterschool. In overeenkomst met het *Family Investment Model* en het *Family Stress Model* hebben wij gevonden, dat SES de taalvaardigheden en schoolrijpheid van het kind indirect beïnvloedt door opvoedingsprocessen (de kwaliteit van de thuisomgeving en het bieden van ondersteunende discipline). Dit suggereert dat het verbeteren van opvoedingspraktijken van ouders een effectieve manier kan zijn om de negatieve effecten van lage SES op de ontwikkeling van het kind af te zwakken. Wij toonden de werking van deze gezinsmechanismes aan in een steekproef bestaande uit twee etnische groepen (Mapuche en Chilenen) in het zuiden van Chili. In deze context is het noemenswaardig dat we geen cultuurverschillen tussen de Mapuche en Chileense gezinnen gevonden hebben.

Bovendien vonden wij steun voor de belangrijke rol van EFs bij de taalontwikkeling van kleuters. Tenslotte bleek uit ons onderzoek dat de

kwaliteit van de kleuterscholen uit onze bijna gelijkmatige verdeelde steekproef van openbare scholen en overheid-gesubsidieerde particuliere scholen in het zuiden van Chili inadequaat was. De lage kwaliteit van kleuterscholen is alarmerend, omdat dit betekent dat grote aantallen kinderen met onderwijs beginnen zonder de basale cognitieve en sociaal-emotionele vaardigheden die nodig zijn voor een succesvolle schoolcarrière. Daarnaast is de lage kwaliteit van kleuterscholen een extra risico (bovenop de lage kwaliteit van de thuisomgeving) voor ontwikkelingsachterstanden in sociaal-economisch kwetsbare kinderen en draagt bij aan het verbreden van de prestatiekloof en de intergenerationele instandhouding van armoede. Uit het onderzoek in dit proefschrift blijkt het belang van kwaliteitsverbetering van het voorschoolse onderwijs in Chili, zodat ieder kind toegang heeft tot onderwijs van goede kwaliteit (en niet slechts kinderen van welgestelde families) als drijvende kracht, om sociale ongelijkheid te verminderen. Ten slotte onderstrepen wij het belang van investeringen in de training en opleiding van tegenwoordige en toekomstige ouders, pedagogische medewerkers en leerkrachten in het kleuteronderwijs, om hen bewust te maken van de belangrijke rol die zij hebben in de ontwikkeling en het welzijn van de kinderen en hen de kennis en competenties mee te geven, die zij nodig hebben om opvoeding van goede kwaliteit te kunnen bieden.

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"Mama, when is this woman leaving again?"
(5-year-old about the researcher in her home)

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Curriculum Vitae

Regina Tahirih Löhndorf was born on July 2nd 1980 in Duisburg, Germany. She graduated from the Andreas Vesalius Gymnasium in 1999. After completing secondary school, Regina worked as a volunteer at a First Nations school on Vancouver Island (Canada). She started to study psychology at the Radboud University in Nijmegen (The Netherlands) in 2001. She was granted *cum laude* on her propedeutic exam in 2002 and completed her Master's degree in clinical psychology with a *cum laude* grade point average in 2006. During the last year of her master program she did an internship at the psychiatric hospital Bedburg-Hau (Germany) and obtained the Basic Psychodiagnostics Certificate of the NIP (Dutch Association of Psychologists). After her graduation from university she worked for one year as a volunteer at a rural elementary school for indigenous Mapuche children in the South of Chile. In 2008, she worked at the department for specialized diagnostics of the Vincent Van Gogh Centre of Excellence for Neuropsychiatry in Venray (The Netherlands). After this work experience she returned to Chile and worked for several years as lecturer at the Universidad Autónoma (Temuco), Universidad Austral (Valdivia), and Universidad Católica (Temuco). She taught developmental psychology, personality psychology, and psychopathology at the departments of psychology and education and additionally English to professionals and academics with postgraduate degrees. In 2013 she got awarded the CONICYT (National Commission for Scientific and Technological Research) grant from the Chilean government, which allowed her to conduct research as part of the Ph.D. trajectory at the Centre for Child and Family Studies of Leiden University (2014-2017). This dissertation presents the results of her research project.

Publications

Lohndorf, R. T., Vermeer, H. J., Cárcamo, R. A., & Mesman, J. (2017). Preschoolers' Vocabulary Acquisition in Chile: The Roles of Socioeconomic Status and Quality of Home Environment *Journal of Child Language (online first)*. doi:10.1017/S0305000917000332