Childcare in Chile. The role of ethnicity and socioeconomic inequalities

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5 Breaking the cycle of poverty? Early childcare, socio-economic status and ethnicity in Chile

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Abstract

Two longitudinal studies are reported examining the long-term effects of full-time daycare in Mapuche and non-Mapuche families in Chile. The first study, the Magellan-Leiden Childcare Study (MLCS), used a sample of 95 mothers with children younger than one year old (n = 36 in daycare). In the second study, we cross-validated our results in a large and representative sample of 10723 mothers and their children (n = 2922 in early daycare; n = 6464 in late daycare) from the Chilean Encuesta Longitudinal de la Primera Infancia (ELPI). In both studies, the quality of care for children provided at home was measured with the Home Observation for Measurement of the Environment (HOME). In the MLCS study, additional indicators of the mother-child relationship were measured.

Contrary to expectations, daycare did not negatively affect the mother-child relationship as compared to maternal care nor did it have an effect on the quality of the home environment. Using data from the ELPI, we were able to confirm the result that type of care does not differentially affect quality of the home environment. That this quality seems to decrease over the first years of life is a phenomenon that remains to be explained.

Keywords: childcare; attachment, maternal sensitivity; quality of care; ethnicity; inequality.

Introduction

The first Bachelet administration (2006-2009) introduced the public program *Chile Crece Contigo* (*Chile Grows With You*) to improve the quality of life of young children and their mothers. An elaborate system of regular health checks, information and help during pregnancy and after delivery to improve maternal care and child wellbeing was set up in well baby clinics and hospitals. This program has been recognized as an important means to reach a system of child health care comparable to that of developed countries. *Chile Grows With You* also introduced free access to full-time daycare from birth up to 4 years of age for children of the 40% financially most vulnerable families. Free daycare attendance

for the lower SES groups is viewed as a double protection: on the one hand, it is believed that young children will benefit from daycare both cognitively and socio-emotionally; on the other hand, parents of children attending daycare can enter the labor market and/or improve their education and training. Parents are also expected to regularly attend workshops about parenting organized by the daycare centers and to actively participate in the planning and organization of learning activities for their children (JUNJI, n.d.). Parents could thus in the short or long run earn a higher family income and possibly acquire better parenting skills. Taken together, these possible effects could break the cycle of poverty, which implies that poor and unemployed parents who otherwise would not be able to provide the right education for their offspring who in their turn would grow up poor, now will be empowered to break out of this vicious cycle.

The government policy to promote female labor force participation and daycare attendance has not yet proved effective (Medrano, 2009). Currently, about 43 percent of Chilean women have entered the labor market and the number of public daycare centers for children under two years of age grew more than fivefold between 2006 and 2009 (Chile Crece Contigo, n.d.). As a result, in 2009 approximately 37.4 percent of the preschoolers received non-maternal care and most of them full-time (Medrano, 2009).

However, both child experts and lay persons in Chile have questioned this new government policy, in particular, because infants can enter daycare centers at a very tender age and because daycare can be attended fulltime (i.e., 40 or more hours per week). Among other things, it is feared that the mother-infant attachment relationship will suffer from full-time daycare if infants enter daycare at a very young age. To the best of our knowledge, only one study in Chile compared the quality of the mother-child interaction for children attending daycare versus children receiving maternal care exclusively. Olhaberry (2011) reported that children in daycare did not experience different quality of interaction with the mother compared to children receiving maternal care exclusively. However, a significant association between age of entry and quality of the mother-child interaction was reported within the daycare group. Children who entered a daycare center before six months old experienced lower quality of interaction than others who entered later (Olhaberry, 2011).

Studies on quality of childcare have been conducted principally in North America and Europe and generally have shown benefits of good-quality care and risks of high-quantity and/or poor-quality care (e.g., Burchinal, Cryer, Clifford, & Howes, 2002; NICHD, 2002; Vandell et al., 2010). Full-time daycare may be physiologically stressful for children (Gunnar, Talge, & Herrera, 2009; Vermeer & Van IJzendoorn, 2006) and a history of extensive daycare during the first years predicts externalizing behavior, even until the age of 15 (Vandell et al., 2010). The NICHD Early Childcare Research Network (1997) found no significant main effect for daycare attendance on the attachment relationship with the mother, but reported specific conditions under which daycare features are linked to attachment and subsequent developmental outcomes. At the age of 15 months, infants were less likely to be securely attached to their mother when low maternal sensitivity was combined with either one of the following conditions: poor

quality of daycare, high quantity of daycare (more than 10 hours per week), or variability of daycare (more than one daycare arrangement) (for an overview, see Friedman & Boyle, 2008).

It is unclear whether findings from the large-scale NICHD study can be generalized to the Chilean daycare context but there are some causes for concern. First, the Chilean government promotes high-quantity daycare and many Chilean infants spend 40 or more hours in daycare. Second, the Chilean policy is to offer free daycare for the children of the lower SES families. However, it has been found that children from lower SES families on average receive less sensitive care at home (Mesman, Van IJzendoorn, & Bakermans-Kranenburg, 2012). Thus, the Chilean policy may result in a combination (low maternal sensitivity and high-quantity daycare) that proved detrimental to mother-child attachment in the NICHD study.

For these reasons, we hypothesize that children from low SES families, who enter daycare early and on a full-time basis, after one year of daycare will have a less adequate attachment relationship with their mother than those who received maternal care at home. On the other hand, we hypothesize that attending daycare may result in a better quality of the home environment. Parents of children attending daycare may use knowledge acquired during workshops (e.g. about parenting) and while attending daycare centers (e.g., concerning toys or cleanliness) in the home.

The main focus of our research is thus whether children who attend daycare centers full-time during the first year of life experience changes in their relationship with the mother and in the quality of the home environment. In a first study, the Magellan-Leiden Childcare Study (MLCS), indicators of the quality of the mother-child interaction and the home environment are distinguished, including attachment behavior, maternal sensitivity and the quality and quantity of support and stimulation for children provided at home (home quality). These indicators were measured just before the start of daycare and at the end of the child's first year of life. In the second study, using data from the Chilean Encuesta Longitudinal de la Primera Infancia (ELPI, 2010), we cross-validate part of our results in a large, nationally representative sample.

MLCS

Method

Participants

Families from three public health centers and 19 public childcare centers in the Araucanía and Castro-Chiloé areas in Chile were invited to participate in this study. Participants were eligible if they had a child younger than one year who had, at the start of the study, no daycare experience yet. All eligible families (n = 370) received a brochure which explained the study. After a visit by one of the researchers explaining the study, 110 families (38%) confirmed their willingness to participate, and gave written consent for the home interview and recording videos of mother-infant interactions. At Time 1, 51 mothers (46%) registered

for public daycare with the intention to have their child enter daycare in the following month; the other mothers (n = 59; 54%) declared their intention to provide maternal care exclusively at least for the first year after birth.

Before the Time 2 assessment, fifteen families dropped out of the study. Compared with mothers who completed the two observations, those who dropped out before Time 2 had a lower income, were of a younger age, and more often had a single mother status. Between Time 1 and Time 2, 12 mothers who initially chose for daycare eventually decided to provide maternal care exclusively, whereas six mothers switched from maternal care to daycare. In the reported study, only those children were included in the daycare group who actually attended daycare in the first year of life.

The sample who completed the two observations (n = 95) consisted of low to middle class indigenous Mapuche (n = 39; 41%) and non-Mapuche (n = 56; 59%) families. The mean age of the infants was 6.40 months (SD = 1.58) at Time 1 and 14.85 months (SD = 1.36) at Time 2. Fifty-eight percent of the sample consisted of boys and 38% were raised by single mothers. The educational level of the mothers was distributed as follows: 6% did not attend school or did not complete primary school, 23% percent completed primary school or some years in secondary school, 58% finished secondary school, and 13% finished vocational or university studies. Most mothers (85%) reported to have a religion, of whom 41% reported to be Catholic, 39% were Evangelic and 5% had another religion (e.g., Jehovah's Witnesses, Mormons). As for childcare arrangement, 36 children (38%) attended fulltime daycare center (M = 37.66, SD = 5.84, hours/week) and 59 children (62%) received maternal care exclusively. Means and standard deviations for demographics are displayed in Table 1 for the total group and subgroups separately. Children who received maternal care exclusively were significantly younger than those who attended daycare centers (t = 3.48, df = 93, p < .001). There were no significant differences between these two groups in any other demographic variable (see Table 1).

Instruments

Attachment behavior and maternal sensitivity. The Attachment During Stress scale (ADS; Massie & Campbell, 1992) was used to measure maternal sensitivity and infant attachment behavior towards the mother. The ADS is a one-page coding system of standardized observation of mother-infant behavior composed of two separate subscales: one for infant behavior and one for mother behavior. It can be used in mildly stressful situations, such as a pediatrician's consult, but also during naturally occurring activities like dressing, feeding, and ending bathing (Massie & Campbell, 1992). In a validation study it was shown that the ADS is a reasonably valid instrument able to distinguish between insecurely and securely attached infants, and that it also captures aspects of maternal sensitivity (Cárcamo, Van IJzendoorn, Vermeer, & Van der Veer, 2013).

Both subscales share the same contents, scoring system, and procedure. Each subscale contains seven typical attachment behaviors: gazing, vocalizing, touching (infant clinging), touching (resisting contact), holding, affect, and proximity. These seven behaviors are scored on a scale from 1 to 5, where scores

1 and 2 indicate less contact and avoidant behavior, scores 3 and 4 represent the use of the attachment figure as a secure base (for the mother subscale: sensitive behavior), and score 5 represents overanxious behavior or an unusually strong reaction to stress (for the mother subscale: an unusually strong reaction to stress of the child). Trained students who conducted the visits, recorded three types of mother-child interaction (change diaper, free play and feeding) at home at both time points. The video-recordings were coded afterwards by four coders who were trained to reliability of either the infant subscale or the mother subscale, and who also participated in the validation of the scale (Cárcamo et al., 2013). The observers independently coded mother and child behavior; coders who coded infant behavior did not code mother behavior for the same mother-infant pair and vice versa.

For our purposes and statistical analysis, we did not use the scores for *touching (b)* and *holding* behaviors, since those behaviors are for the most part dependent of the behavior displayed by the other part of the dyad. As a consequence, these behaviors were often not observed and therefore excluded from the analysis. We calculated a single score of attachment security and maternal sensitivity independently for infant and mother, based on the frequencies of the secure scores (scores 3 and 4) obtained in each of the five behaviors displayed. Thus, infant and mother independently got a score between 0 – 5. For the infant subscale, 0 represents no secure attachment behavior displayed and 5 means that all the behaviors were scored as typically seen in a securely attached child. For the mother subscale, 0 represents no sensitive behavior displayed to regulate the child's stress and 5 means that all the behaviors displayed were sensitive in regulating the stress of the child. To establish inter-rater reliability, we used a separate set of video-recordings from another Chilean study (Cárcamo, Lagos & Gómez, 2013). The four observers independently coded infant behavior (n = 15) in a reliable way, reaching a *Fleiss Kappa* = .63, and mother behavior from 15 different mother-infant dyads were coded with a *Fleiss Kappa* = .77.

Quality of the home environment. The Infant/Toddler Home Observation for Measurement of the Environment (IT-HOME; Caldwell & Bradley, 2003) was used to measure the quality and quantity of stimulation and support available to the child in the home environment. The IT-HOME is composed of 45 items, which can be scored as positive (1) or negative (0) based on 30 minutes of observation and a semi-structured interview afterwards. The binary-choice items are summed and provide a total score, which may range from 0 to 45, the latter showing the highest quality of the home environment. The HOME Inventory has demonstrated to be a valid instrument in the Chilean context (Bustos, Herrera, & Mathiesen, 2001) and in US minority groups (Bradley, Corwyn, McAdoo, & Coll, 2001). Internal consistency of the instrument was moderate at Time 1, with a Cronbach's alpha of .58, and good at Time 2 (α = .71). However, the HOME aims at assessing potentially independent features of the environment and high internal consistency should not be expected (Bradley, Corwyn, & Whiteside-Mansell, 1996). Observations were done by eight students in the fifth year of a Psychology undergraduate program, who followed an elaborate training procedure (i.e., studying the manual, discussing items, video-observations, and three home

visits). Inter-rater reliability was established to a criterion of 80% agreement with expert criteria scores during the training procedure. Observations at each time point were done by different observers. For the purpose of this study, IT-HOME mean scores will be reported, that are obtained by dividing the number of items that are scored positively by the total number of items of the scale (45).

Ethnicity. The ethnicity of the family was determined by self-report (cf. Baumeister, Marchi, Pearl, Williams, & Braveman, 2000; Boehmer, et al., 2002). Families were defined as Mapuche when mothers stated in the interview that their children live in a Mapuche family.

Income. Mothers were asked for the monthly family income in Chilean Pesos (CLP) and the number of household members. This resulted in the following per capita categories: no income (1); less than $ 61.911 ($ 114 USD) (2); between $ 61.912 and $ 105.907 ($ 195 USD) (3); between $ 105.908 and $ 167.879 ($ 310 USD) (4); between $ 167.880 and $ 300.869 ($ 556 USD) (5); between $ 300.870 and $ 2.500.000 ($ 4.620 USD) (6); over $ 2.500.000 (7). The distribution of the classifications was based on the five quintiles from the Instituto Nacional de Estadísticas de Chile (National Institute of Chilean Statistics) and the last quintile was divided into two categories due its large range.

Maternal educational level. The level of maternal education was self-reported on a 1-5 point scale (1 = *no education or incomplete elementary*; 2 = *incomplete secondary school*; 3 = *secondary school*; 4 = *vocational education*; 5 = *university studies*).

Procedure

Families were visited twice by different students at each time point. Time 1 observations took place just before children started daycare and Time 2 observations were scheduled approximately eight months later. Each time point consisted of two visits, taking approximately two hours each. During the first visit the IT-HOME was administered and mothers were asked to fill out the questionnaires concerning background information and self-report scales. The second visit consisted of video-recordings during three standard episodes of mother-infant interaction (changing diaper, free play and feeding the baby). At both time points, the same procedures and measures were used.

Results

Similarities and Differences in Background Variables dependent on Type of Care and Ethnicity

Firstly, using one-way ANOVAs we examined whether there were significant differences in background variables distinguishing Type of care (Maternal care versus Daycare) and Ethnicity (Mapuche versus non-Mapuche). The ANOVAs showed that there were overall significant effects for income (F [3, 91] = 3.88, p = .012, η^2 = .11) and child age (F [3, 91] = 6.18, p = .001, η^2 = .17). Post hoc tests showed that the Mapuche maternal care group (M = 2.23, SD = 0.86) had a significantly lower income than the non-Mapuche daycare group (M = 3.22, SD = 1.31). The other groups did not differ significantly on income. As for child age, post hoc test showed that children in both the Mapuche (M = 5.88, SD = 1.51) and non-

Mapuche group (M = 6.06, SD = 1.25) receiving maternal care were significantly younger than children in the non-Mapuche daycare group (M = 7.52, SD = 1.76). To test for group differences in dichotomous background variables, chi-square analyses were performed. No significant differences between groups were found for child gender and marital status (see Table 1).

Associations between Demographics, Attachment, Maternal Sensitivity and Quality of the Home Environment.

Bivariate correlations were calculated to inspect which variables were significantly associated with each other. For analysis purposes, the most relevant associations are discussed. Type of care was negatively associated with child age (r = -.34, p < .001), and positively correlated with ADS mother sensitivity at Time 1 (r = .31, p < .01), which means that children receiving daycare were older and had more sensitive mothers at Time 1 than children receiving maternal care. Ethnicity was significantly associated with income (r = .25, p < .01), quality of the home environment at Time 1 (r = .26, p < .01), and infant attachment behavior at Time 1 (r = .24, p < .05). Non-Mapuche families had a higher income, provided higher quality of care, and their children displayed more secure attachment behavior than those from Mapuche families at Time 1.

Quality of the home environment was positively correlated between Time 1 and Time 2 (r = .43, p < .001). Additionally, infant attachment behavior and ADS mother sensitivity measured at Time 2 were positively associated with maternal education level (r = .20, p < .05, and r = .27, p < .01 respectively). Finally, ADS mother sensitivity at Time 2 showed a positive correlation with quality of the home environment at Time 2 (r = .25, p < .05), infant attachment behavior at Time 1 (r = .25, p < .05), infant attachment behavior at Time 2 (r = .36, p < .001), and ADS mother sensitivity at Time 1 (r = .26, p < .05), all in the expected direction (see Table 2).

Table 1.
Descriptive Statistics of Demographic Background Variables in the MLCS at Time 1

		Maternal care			Daycare				
		Mapuche $N = 26$	non-Mapuche $N = 33$	Total $N = 59$	Mapuche $N = 13$	non-Mapuche $N = 23$	Total $N = 36$		
Demographics background		*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*	*F*	η^2
Income		2.23 (0.86)[a]	2.97 (1.31)	2.64 (1.19)	2.46 (0.52)	3.22 (1.31)[b]	2.94 (1.15)	3.88*	0.11
Maternal education		2.77 (0.95)	2.94 (1.09)	2.86 (1.03)	2.77 (0.73)	2.87 (0.76)	2.83 (0.74)	0.20	0.00
Maternal age (years)		27.17 (6.91)	25.27 (7.26)	26.11 (7.11)	26.08 (9.04)	26.70 (7.30)	26.47 (7.85)	0.35	0.01
Child age (months)		5.88 (1.51)[c]	6.06 (1.25)[c]	5.98 (1.36)	6.31 (1.32)	7.52 (1.76)[d]	7.08 (1.70)	6.18***	0.17
		N (%)	*N* (%)	*N* (%)	*N* (%)	*N* (%)	*N* (%)	χ^2	
Child gender	Male	16 (61.5)	18 (54.5)	34 (57.6)	8 (61.5)	13 (56.5)	21 (58.3)	0.38	
	Female	10 (38.5)	15 (45.5)	25 (42.4)	5 (38.5)	10 (43.5)	15 (41.7)		
Marital status	Single	10 (38.5)	12 (36.4)	22 (37.3)	7 (53.8)	7 (30.4)	14 (38.9)	1.99	
	Couple	16 (61.5)	21 (63.6)	37 (62.7)	6 (46.2)	16 (72.7)	22 (61.1)		

Note. Numbers in rows with different letters differ significantly. *F* differences between the four groups (2 type of care by 2 ethnicity) excluding total group._
Chi-squares for all groups (2 type of care by 2 ethnicity), excluding total group.
* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 2.
Correlations Between Child Rearing and Demographic Background Variables at Time 1 in the MLCS (N = 95) and ELPI (N = 10,723)

		1	2	3	4	5	6	7	8	9	10	11	12	13
1	Type of care[a]	-	.01	.01	.05***	-.02	.02*	-.01	.44***	.02*	.00			
2	Ethnicity[b]	.08	-	.09***	-.01	.10***	-.02*	-.00	-.01	.11***	.08***			
3	Income	.13	.25**	-	.08***	.44***	.09***	-.00	-.01	.24***	.22***			
4	Maternal age	.02	-.09	.12	-	.03***	.27***	.01	.18***	.06***	.08***			
5	Maternal education	-.02	.02	.27**	.05	-	-.02	-.00	-.03**	.29***	.26***			
6	Marital Status[c]	-.02	-.02	.16	.32***	.03	-	.02	.02*	.08***	.02			
7	Child gender	-.01	.04	.07	-.03	.04	.14	-	.01	.02	.03***			
8	Child age	-.34***	.19	.00	.06	.09	-.11	-.18	-	-.02*	-.03**			
9	HOME global quality Time 1	.04	.26**	.33***	-.02	.25**	.02	.09	.16	-	.26***			
10	HOME global quality Time 2	-.01	.04	.36***	-.03	.34***	.06	.16	.07	.43***	-			
11	ADS infant attachment Time 1	.02	.24*	.18	-.05	.13	-.00	.03	-.22*	-.07	.10	-		
12	ADS infant attachment Time 2	.06	-.07	.13	.03	.20*	.00	.01	-.01	.03	-.06	.04	-	
13	ADS mother sensitivity Time 1	.31**	.12	.16	.19*	.17	.11	-.01	.08	.17	.14	-.01	.15	-
14	ADS mother sensitivity Time 2	.02	-.05	.09	.05	.27**	.01	-.10	-.08	.08	.25*	.25*	.36***	.26*

Note. [a] Type of care: maternal care = 0, daycare = 1. In this table, maternal care and late daycare in ELPI were combined as maternal care; [b] Mapuche = 0, non-Mapuche = 1; [c] Marital status: single = 0, couple = 1 (married or unmarried). Correlations above the diagonal line represent the ELPI study.
*$p < .05$. ** $p < .01$. ***$p < .001$.

Table 3.
Descriptive Statistics of Child Rearing Variables in the MLCS (N = 95)

		Time 1 (6m)			Time 2 (14m)		
		Mapuche	Non-Mapuche	total	Mapuche	Non-Mapuche	total
Child rearing variables		*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)
HOME global quality	Maternal care	.73 (.07)	.78 (.07)	.76 (.07)	.81 (.08)	.81 (.11)	.81 (.10)
	Daycare	.74 (.07)	.77 (.09)	.76 (.09)	.79 (.07)	.81 (.08)	.80 (.08)
	Total	.73 (.07)	.78 (.08)	.76 (.08)	.80 (.07)	.81 (.10)	.81 (.09)
ADS infant attachment	Maternal care	2.38 (1.06)	2.61 (1.03)	2.51 (1.04)	2.62 (1.33)	2.79 (1.29)	2.71 (1.30)
	Daycare	1.92 (0.95)	2.91 (1.16)	2.56 (1.18)	3.46 (1.05)	2.57 (1.59)	2.89 (1.47)
	Total	2.23 (1.04)	2.73 (1.09)	2.53 (1.09)	2.90 (1.29)	2.70 (1.41)	2.78 (1.36)
ADS mother sensitivity	Maternal care	3.00 (1.47)	3.03 (1.45)	3.02 (1.44)	2.88 (1.61)	2.70 (1.79)	2.78 (1.70)
	Daycare	3.77 (1.48)	4.00 (1.00)	3.92 (1.18)	2.92 (1.44)	2.78 (1.28)	2.83 (1.32)
	Total	3.26 (1.50)	3.43 (1.36)	3.36 (1.41)	2.90 (1.54)	2.73 (1.59)	2.80 (1.56)

Note. Sample distribution: Mapuche in maternal care $n = 26$, Mapuche in daycare $n = 13$; non-Mapuche in maternal care $n = 33$, non-Mapuche in daycare $n = 23$.

Changes in Attachment Relationship, Maternal Sensitivity and Quality of the Home Environment

To test whether the quality of the attachment relationship, maternal sensitivity and the quality of the home environment changed during the child's first year of life dependent on type of care and child ethnicity, we conducted two repeated measures MANCOVAs. Mean scores for both time points separated for type of care and ethnic group are displayed in Table 3. In the first doubly repeated measures MANCOVA, children's attachment relationship with the mother and maternal sensitivity –both measured with the ADS– were dependent variables, whereas in the second MANCOVA quality of the home environment was dependent variable. In both analyses, time was included as within-subjects variable, and type of care and ethnicity as between-subjects factors. In addition, parental income and child age were included as covariates, because of the significant associations with the variables of interest.

A repeated measures MANCOVA on children's attachment relationship and mother sensitivity using a 2 (time: Time 1 versus Time 2) by 2 (type of care: Maternal care versus Daycare) by 2 (ethnicity: Mapuche versus non-Mapuche) design with parental income and child age as covariate did not yield significant main effects of time, neither for attachment (Pillai's, F [1, 89] = 0.71 $p = .40$, $\eta_p^2 = .01$), nor for maternal sensitivity, (Pillai's, F [1, 89] = 0.04, $p = .84$, $\eta_p^2 = .00$). Thus, for the whole group attachment and maternal sensitivity did not change over time. However, we found a significant interaction effect of ethnicity by infant attachment behavior (Pillai's, F [1, 89] = 6.04, $p = .016$, $\eta_p^2 = .06$), and a three-way interaction effect of type of care by ethnicity by infant attachment behavior (Pillai's, F [1, 89] = 4.13, $p = .045$, $\eta_p^2 = .04$). As can be seen in Figure 1, infant attachment behavior positively changed from Time 1 to Time 2, but only for Mapuche children and specifically for those children who received daycare in the first year of life.

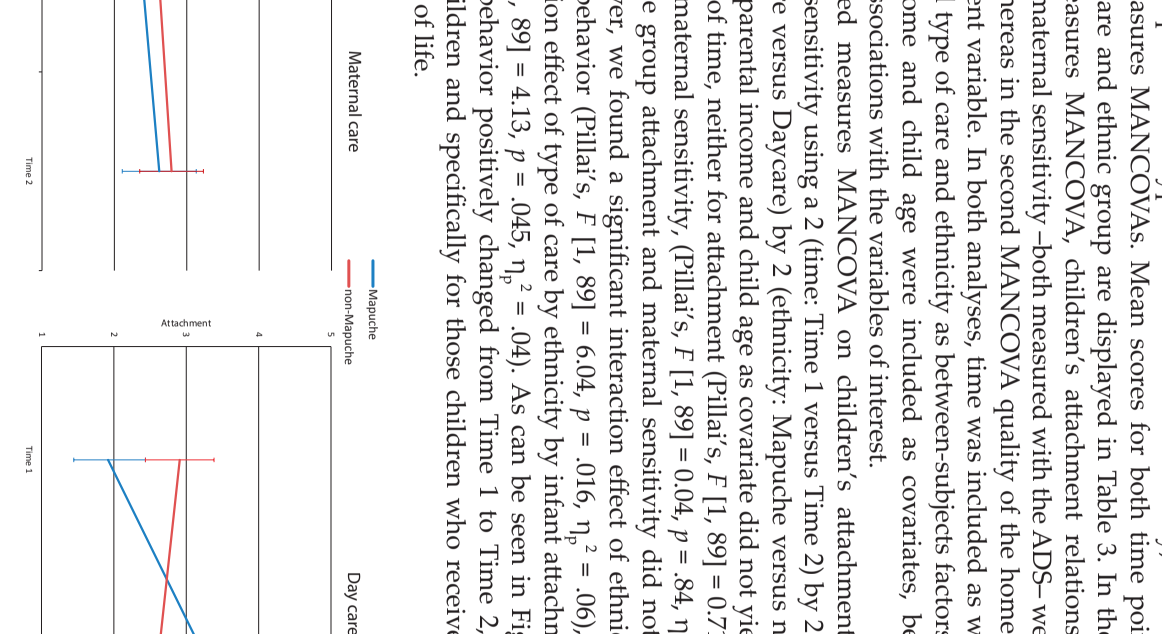

Figure 1. Changes in attachment behavior over time dependent on type of care and ethnicity.

To test whether the quality of the home environment changed during the child's first year of life dependent on type of care and ethnicity, we conducted

another repeated measures MANCOVA. We used a 2 (time: Time 1 versus Time 2) by 2 (type of care: Maternal care versus Daycare) by 2 (ethnicity: Mapuche versus non-Mapuche) design with parental income and child age as covariates. This did not yield a significant main effect of time (Pillai's, F [1, 89] = 0.10, p = .751, η_p^2 = .00). Also, we did not find any interaction effects between type of care, ethnicity and quality of the home environment.

Discussion

Our hypothesis that fulltime early daycare will have negative effects on the quality of child attachment behavior and maternal sensitivity was not confirmed. On the contrary, the subgroup of Mapuche children showed improved attachment behavior after one year of daycare. Our second hypothesis that daycare may have positive effects on the quality of the home environment was not confirmed either. Type of care (daycare versus maternal care) was not associated with changes in the quality of the home environment.

The findings of our study are intriguing. The implementation of the new Chilean policy to promote fulltime early daycare attendance has no negative effects on maternal sensitivity, child attachment behavior, and quality of the home environment. Neither could we demonstrate any overall positive effects. The exception was formed by the Mapuche children who benefitted from daycare and showed more secure attachment behavior after one year of daycare. It is possible that the caregiver-child interactions in daycare centers, which have been shown to be of high quality (Cárcamo et al., submitted), have positive effects on these children, and may compensate for lower quality of care at home. Within the Chilean context, these caregiver-child interactions are facilitated by the high level of education of the caregivers (at least 4 years of university or its equivalent), and the high number of caregivers per classroom. Future research will have to show whether this positive finding is indeed associated with ethnicity or that in larger samples with a broader income range it will turn out to be a socioeconomic status effect after all.

Strengths and limitations

This is the first longitudinal study to report on the effects of early full-time daycare on mother-child attachment and quality of the home environment. Moreover, it makes use of observation scales rather than self-reports or surveys. It is also the first empirical study focusing on infant attachment behavior and maternal sensitivity of the Mapuche minority in their region of origin.

The limited sample size restricts the generalizability of the results. Although the daycare centers in our sample belong to the same group of public centers that are carefully monitored, another limitation is that we did not control for quality of daycare and caregiver sensitivity. Drawing on the results from the NICHD study, it is possible that high quality care with a sensitive caregiver moderates the effects of low maternal sensitivity on attachment security. Finally, we did not check to what extent the Mapuche families in our sample share the traditional Mapuche values, which leaves the possibility open that we did not reach the

most 'orthodox' Mapuche group.

The results of our study are promising for the *Chile Grows With You* policy. In our sample, we found that attending daycare from a very young age and for many hours per week has no negative results for the mother-child attachment relationship and that the worries of both lay persons and experts could not be supported in this study. On the other hand, it remains to be seen whether the alleged positive effects of this policy (higher cognitive and socio-emotional skills in children, increased labor participation and better education for parents) will become a reality.

ELPI study

Method

Participants

ELPI data were available for two time points, in 2010 and 2012 respectively. We included families with complete data of the variables of interest at both time points resulting in a sample of N = 10,723 children and their families, of whom 776 (7%) families belonged to the Mapuche ethnic minority group and 9,947 (93%) families belonged to the majority group in Chile. Mean age of all mothers was 29.40 years (SD = 7.17) at Time 1. Mean age of the children was 30.50 months (SD = 12.76; range from 7 to 56 months) at Time 1, and 56.54 months (SD = 12.77; range from 33 to 83 months) at Time 2. Fifty percent of the sample consisted of boys and 28% were raised by single mothers. The educational level of the mothers was distributed as follows: 0.4% did not attend school or did not complete primary school, 18% percent completed primary school or some years in secondary school, 65% finished secondary school, and 16.6% finished vocational or university studies.

Because our main interest was type of care and Mapuche ethnicity, we only included families belonging to the Mapuche and majority (hereafter: non-Mapuche) ethnic groups, and we left out other ethnic minorities such as Aymara, Atacameño, Diaguita. Furthermore, we distinguished between children who started daycare before 24 months (early daycare) and after 24 months (late daycare). This was done because the children in the ELPI study were older than the children in the MLCS, and because the time span between Time 1 and Time 2 was wider than in the MLCS. This resulted in three groups, the maternal care group (N = 1,337; 12.5%), the early daycare group (N = 2,922; 27.2%), and the late daycare group (N = 6,464; 60.3%).

Procedure

The first time point for assessment was in 2010. During a first visit, the interviewers (n = 467; 78% female) introduced the ELPI through a letter which explained the study, highlighting its importance for the development of new public policies and clarifying the anonymity and voluntary participation. Interviewers tried to engage the participants, collected demographic data and arranged the second visit. The second visit was conducted by 326 observers (85% female), and all

of them had a higher education in the social sciences, mostly psychology. The goal of the second visit was to measure the child's physical, cognitive and socio-emotional development and the quality of the home environment. In the reported study, we will only use data on the home environment. Observations during the second visit were completed for 91.6% of the families interviewed during the first visit. Interviewers received an extensive training explaining the goal of the study, details of the survey, and the standardization of the procedures. The data collection took place in 2010; all the surveys were double-checked by supervisors, and 10% of the interviews were also supervised during data collection to ensure high quality of the process and the data.

The second time point for assessments was in 2012 and the same procedure was followed. The first visit was intended to re-engage the family into the study and to make an appointment for the second visit by a professional psychologist.

Instruments

Quality of home environment. Quality of the home environment was measured with the IT-HOME at Time 1. For the majority of the sample (n = 10,483; 97.7%) the Early Childhood Home Observation for Measurement of the Environment (EC-HOME; Caldwell & Bradley, 2003) was used at Time 2; in 240 families the IT-HOME was used at Time 2. In both measures, a restricted number of items were selected (32 items for IT-HOME at Time 1 and 22 items at Time 2, and 16 items for EC-HOME). Bivariate correlations between IT-HOME at Time 1 and Time 2, and between IT-HOME and EC-HOME were comparable (respectively r = .24 and r = .26). Internal consistency of both instruments was good, with a Cronbach's alpha of .77 for the IT-HOME at Time 1, α = .75 for IT-HOME at Time 2, and α = .81 for EC-HOME at Time 2. Because of comparable content of items, correlations and reliabilities, we decided to aggregate scores across IT-HOME and EC-HOME (at Time 2), resulting in one score for Time 2 (hereafter labeled as EC-HOME).

Background variables

Ethnicity. The ethnicity of the family was defined by self-report. Families were defined as belonging to the Mapuche when the mother and/or principal caregiver stated in the interview that they belonged to this particular minority.

Income. Mothers or main caregivers were asked for the monthly family income in Chilean Pesos (CLP). This resulted in the following 10 categories: less than $ 64.000 ($ 118 USD) (1); between $ 64.000 and $ 132.000 ($ 244 USD) (2); between $ 132.000 and $ 250.000 ($ 462 USD) (3); between $ 250.000 and $ 350.000 ($ 647 USD) (4); between $ 350.000 and $ 450.000 ($ 832 USD) (5); between $ 450.000 and $ 650.000 ($ 1.201 USD) (6); between $ 650.000 and $ 850.000 ($ 1.571 USD) (7); between $ 850.000 and $ 1.050.000 ($ 1.940 USD) (8); between $ 1.050.000 and $ 1.250.000 ($ 2.310 USD) (9); more than $ 1.250.000 (10).

Maternal educational level. The level of maternal education was self-reported using 19 categories ranging from no education to postgraduate. For the purposes of comparison with the MLCS, we transformed these categories into a 5-point scale (1 = *no education or incomplete elementary*; 2 = *incomplete secondary school*; 3 = *secondary school*; 4 = *vocational education*; 5 = *university studies*).

Results

Percentages of missing data ranged between 0.9% for maternal education to 3.9% for income. There were no missing data for our principal measure, the quality of the home environment (IT-HOME and EC-HOME). To obtain a complete dataset prior to the analyses, multiple imputation was performed (ten iterations) (Van Buuren, 2007; Goldstein & Woodhouse, 1996) including all available variables in the data set using predictive mean matching to impute missing data (Little, 1988; Rubin, 1986). Finally, the pooled imputed dataset (N = 10,723) was used for subsequent analysis.

Similarities and Differences in Background Variables dependent on Type of Care and Ethnicity

Firstly, using one-way ANOVAs we examined whether there were significant differences in background variables distinguishing Type of care (Maternal Care, Early Daycare, and Late Daycare) and Ethnicity (Mapuche versus non-Mapuche). As Table 4 shows, overall mean scores for relevant background variables were significantly different across groups. Overall differences across groups were found for income, F = 20.35, p < .001, η^2 = .01; for maternal education F = 45.87, p < .001, η^2 = .02; for mother age, F = 10.36, p < .001, η^2 = .00; and for child age F = 535.28, p < .001, η^2 = .20. Post hoc tests to detect significant pairwise comparisons (see Table 4) showed that within each of the three type of care groups Mapuche mothers had a significantly lower income and educational level than non-Mapuche mothers. Within type of care groups, there were no significant differences between ethnic groups regarding mother's age and child's age.

Chi-square testing was done for all dichotomous variables. No significant differences across groups were found for child gender. However, marital status differed significantly across groups: The early daycare group consisted of more single mothers than the maternal care group (χ^2 = 61.90, p = .001) and the late daycare group (χ^2 = 99.60, p = .001) (see Table 4).

Associations between Demographics and Quality of the Home Environment

At both time points, significant bivariate positive correlations were found between quality of the home environment and income (r = .24, p < .001 at Time 1, and r = .22, p < .001 at Time 2) and maternal education (r = .29, p < .001 at Time 1, and r = .26, p < .001 at Time 2). Moreover, ethnicity was also associated with income (r = .09, p < .001) and quality of the home environment at Time 1 (r = .11, p < .001), and at Time 2 (r = .08, p < .001) (see Table 2). Mapuche families had lower income and lower quality of the home environment.

Changes in Quality of the Home Environment

To test whether the quality of the home environment changed across the two time points dependent on child care and ethnicity, we conducted a repeated

Table 4.
Descriptive Statistics of Demographic Background Variables in the ELPI at Time 1

		Maternal Care			Early Daycare			Late Daycare			Significant pairwise Comparisons[a]		
		Mapuche $N = 113$	non-Mapuche $N = 1224$	Total $N = 1337$	Mapuche $N = 198$	non-Mapuche $N = 2724$	Total $N = 2922$	Mapuche $N = 465$	non-Mapuche $N = 5999$	Total $N = 6464$			
Demographics background		*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*	MC	ED	LD
Income		3.63 (1.83)	4.37 (2.03)	4.31 (2.02)	4.17 (1.80)	4.67 (2.19)	4.63 (2.17)	3.77 (1.81)	4.56 (2.15)	4.50 (2.14)	M < nM	M < nM	M < nM
Maternal education		2.67 (0.76)	2.95 (0.71)	2.93 (0.72)	2.94 (0.70)	3.17 (0.75)	3.15 (0.75)	2.73 (0.64)	3.02 (0.71)	2.99 (0.71)	M < nM	M < nM	M < nM
Maternal age (years)		29.43 (7.75)	29.17 (7.09)	29.19 (7.15)	28.98 (7.11)	28.64 (7.09)	28.66 (7.09)	30.11 (7.28)	29.76 (7.17)	29.78 (7.17)	n.s.	n.s.	n.s.
Child age (months)		17.92 (7.94)	16.71 (6.72)	16.81 (6.83)	29.49 (13.10)	28.50 (12.43)	28.56 (12.48)	34.71 (11.55)	34.17 (11.66)	34.21 (11.66)	n.s.	n.s.	n.s.
		N (%)	*N* (%)	*N* (%)	*N* (%)	*N* (%)	*N* (%)	*N* (%)	*N* (%)	*N* (%)	χ^2		
Child gender	Male	51 (45.1)	599 (48.9)	650 (48.6)	105 (53.0)	1356 (49.8)	1461 (50.0)	228 (49.0)	3052 (50.9)	3280 (50.7)	4.09		
	Female	62 (54.9)	625 (51.1)	687 (51.4)	93 (47.0)	1368 (50.2)	1461 (50.0)	237 (51.0)	2947 (49.1)	3184 49.3)			
Marital status	Single	28 (24.8)	298 (24.3)	326 (24.4)	66 (33.3)	963 (35.4)	1029 (35.2)	102 (21.9)	1613 (26.9)	1715 (26.5)	94.58***		
	Couple	85 (75.2)	926 (75.7)	1011 (75.6)	132 (66.7)	1761 (64.6)	1893 (64.8)	363 (78.1)	4386 (73.1)	4749 (73.5)			

Note. MC= Maternal Care; ED= Early Daycare; LD= Late Daycare.
[a] The pairwise comparisons are between ethnic groups within type of care.

Table 5.
Descriptive Statistics of Quality of the Home Environment in the ELPI (N = 10,723)

		Time 1			Time 2		
		Mapuche $N = 776$	non-Mapuche $N = 9947$	Total $N = 10723$	Mapuche $N = 776$	non-Mapuche $N = 9947$	Total $N = 10723$
		M (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)
HOME global quality	Maternal care	.68 (.15)	.75 (.13)	.75 (.14)	.58 (.20)	.66 (.20)	.65 (.21)
	Early daycare	.73 (.13)	.76 (.13)	.76 (.13)	.61 (.22)	.68 (.21)	.67 (.21)
	Late daycare	.70 (.14)	.76 (.13)	.76 (.13)	.60 (.21)	.67 (.21)	.66 (.21)
	Total	.71 (.14)	.76 (.13)	.76 (.13)	.60 (.21)	.67 (.21)	.66 (.21)

measures MANCOVA. Mean scores for both time points by type of care and by ethnic group are displayed in Table 5. Because the imputed datasets do not provide pooled outcomes for repeated measures analysis, we report the whole range of F's, p's values and partial η^2 scores from the five imputations. All the analyses were done with and without child age as a covariate and since the results remained the same, we decide to keep this variable as a covariate. We used a 2 (time: Time 1 versus Time 2) by 3 (type of care: Maternal Care, Early Daycare, and Late Daycare) by 2 (ethnicity: Mapuche versus non-Mapuche) design with parental income and child age as covariates. This analysis yielded a significant main effect of time (Pillai's, $58.68 \leq F\ [1, 10710] \leq 63.97$, $p < .001$, $.005 \leq \eta_p^2 \leq .006$). Thus for the whole group, quality of the home environment decreased over time. However, this main effect was qualified by a 3-way interaction effect of quality of the home environment by income and ethnicity (Pillai's, $3.85 \leq F\ [1, 10710] \leq 6.28$, $.012 \leq p \leq .050$, $\eta_p^2 = .00$), showing that in Mapuche families from lower SES a decrease in home quality was most apparent. No other interaction effects were found.

To take a closer look at the interaction effect, the variable income was dichotomized using a median split (median = 4) resulting in two income groups: lower income (n = 6,409; 60%) versus higher income (n = 4,314; 40%). For each income level, we performed a repeated measures analysis using a 2 (time: Time 1 versus Time 2) by 3 (type of care: Maternal Care, Early Daycare, and Late Daycare) by 2 (ethnicity: Mapuche versus non-Mapuche) design with child age as covariate. For the lower income group, only a time effect was significant (Pillai's, $40.42 \leq F\ [1, 6402] \leq 45.45$, $p < .001$, $.005 \leq \eta_p^2 \leq .006$). This result indicates that within the lower income group, all families experienced a decrease in the quality of the home environment, independently of the type of care and ethnicity. For the higher income group, the analysis also yielded a significant main effect of time (Pillai's, $27.53 \leq F\ [1, 4307] \leq 31.03$, $p = .001$, $.006 \leq \eta_p^2 \leq .007$). Thus for the whole higher income group, quality of the home environment decreased over time. However, this main effect was qualified by a 2-way interaction effect of quality of the home environment by ethnicity only in two data sets, the original data set (prior to imputation, 4% of subjects excluded) (Pillai's, $F\ [1, 4116] = 4.52$, $p = .034$, $\eta_p^2 = .001$), and in one of the five imputed data sets (Pillai's, $F\ [1, 4341] = 3.87$, $p = .049$, $\eta_p^2 = .001$). This interaction effect shows that in the higher income group, Mapuche families experienced a more evident decline in the quality of the home environment than non-Mapuche families. However, for the majority of the imputed data sets there was no significant interaction effect and the effect sizes were very small, implying that within the higher income group, if ethnicity plays a role, it is very small.

Discussion

Our analysis of data from the ELPI dataset showed that the quality of the home environment decreased from Time 1 to Time 2, irrespective of the type of care (daycare versus maternal care). Thus, the ELPI data show that type of childcare does not differentially affect the quality of the home environment.

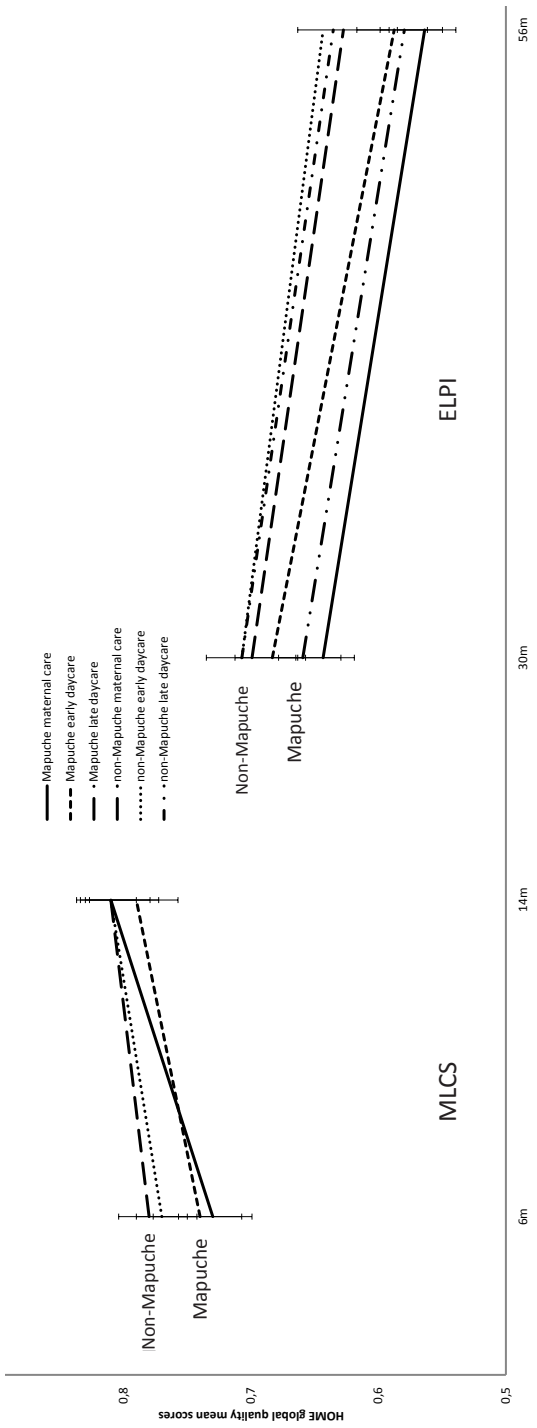

Figure 2. Trajectory of the quality of the home environment scores across time in Mapuche and non-Mapuche children with different types of care arrangements.
Note. In the MLCS study there are not children representing the Late daycare group.

Fulltime early daycare has neither positive nor negative effects on the quality of the home environment as compared with maternal care. The fact that quality of the home environment for all families decreases from Time 1 to Time 2 remains to be explained. Possibly, parents pay less attention to the quality of the home environment as the child grows older and/or they have to divide their limited attention over more siblings (see Figure 2).

Strengths and limitations
The strength of the ELPI is that it is a longitudinal study that uses observational measures (e.g., HOME) in a very large sample that is representative of Chile. Also, it covers a wider child age range and distinguishes between early and late daycare entrance. Limitations of the ELPI, for our purpose, are that it does not include a measurement of attachment behavior or maternal sensitivity. Another limitation is that like in the MLCS the ELPI did not measure daycare center quality.

General Discussion

In the MLCS the fear that fulltime early daycare has negative effects on the quality of child attachment behavior and maternal sensitivity could not be substantiated. A general negative effect did not emerge and the subgroup of Mapuche children from lower income groups even showed improved attachment behavior after one year of daycare. The MLCS also showed, contrary to our expectation, that type of care (daycare versus maternal care) was not associated with changes in the quality of the home environment. This finding was confirmed in the ELPI where we found that quality of the home environment decreased from Time 1 to Time 2, irrespective of the type of care (daycare versus maternal care).

Strengths and limitations
The MLCS used various indicators and instruments to measure the quality of the childcare environment but the size and representativeness of its sample may be a cause of concern. The ELPI study provides just one instrument to measure the quality of the childcare environment but the sample is large and representative. In this respect, the two studies complement each other. For both studies, the instruments used limit the conclusions to be drawn. However, we were able to cross-validate some results of the MLCS using data from the ELPI study, thus comparing the findings from a restricted number of families and a limited variation of SES with findings from a larger family data set with more variation in SES levels.

The finding that full-time early daycare has no effect on mother-child attachment is intriguing. It was expected that the combination of low income and high number of hours spent in daycare would negatively affect the mother-child relationship. The family stress model (Mesman et al., 2012) predicts that mothers who suffer financial stress, bad housing conditions, marital discord etc. are less sensitive in reacting to their infants. However, in the MLCS we did not find lower sensitivity in mothers from low to moderately low income levels.

Early and full-time daycare in itself did not seem detrimental to the mother-child relationship. First, mothers may compensate for the time children spend at daycare by interacting with increased intensity with their children at home (Ahnert et al., 2000). Second, daycare centers may provide adequate models of caregiver-child interaction that parents and their children reproduce in their interactions at home. The combined results of the MLCS and the ELPI show that full-time daycare for children has no negative consequences for the attachment relationship and the quality of the home environment, at least as far as we were able to examine with a restricted number of measures within a restricted time-frame.

Future research will have to show whether the policy from the Chilean government has the expected positive effects for cognitive and socio-emotional development of children and is indeed instrumental in breaking the cycle of poverty.