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Short communication

Birth order, stimulating environment, and maternal factors in developmental outcomes: A longitudinal Mexican study

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ABSTRACT

This study longitudinally examined the interplay between birth-order and well-known risk factors in impoverished environments such as inadequate environmental stimulation, low maternal education, and young maternal age in children from birth to 36 months. In the developmental motor domain, the effect of the stimulating environment over time, favored first-borns. In the adaptive domain, maternal education privileged first-born boys. In language development, first-borns reached higher scores over time than laterborn identifying a positive impact of stimulation. In the personal-social domain, firstborns obtained higher averages overall, but stratified models revealed that later-borns reached the first-borns scores as maternal age increased.

1. Introduction

Early childhood development (ECD) is an essential element of health, human capital, and well-being improvement throughout the life course. Recent literature reports that 43 % of children under five begin life with disadvantages due to a lack of nurturing care which is essential for their physical and psychological development in low- and middle-income countries (LMICs) (Richter et al., 2017). Tran, Luchters, and Fisher (2016) reported that in LMICs, the lack of adequate cognitive stimulation at home negatively impacts the development of children growing up in poverty. On the other hand, there is a paucity of research carried out in these countries identifying the role of birth order (BO), by itself, or in combination with contextual factors in early childhood development outcomes.

Theoretically, relevant studies in the field of psychology have reported that intellectual performance decreases with BO and family size (Zajonc & Markus, 1975). For example, the seminal contribution of Belmont and Marolla (1973) resulted in the formulation of the highly influential "confluence model" (CM), which describes that the intellectual growth of individual members of a family is interdependent of its configuration both in terms of spacing and size (Zajonc & Markus, 1975). Additionally, both the later-born (LB) and the only child will have intellectual disadvantages compared to earlier-born children (Zajonc & Markus, 1975). In the field of sociology, data based on different American surveys of white populations were analyzed by Blake (1981), leading her to describe that

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having more children negatively affected their educational and occupational attainment. This proposition, called "the dilution model," argues that parental resources divide and dilute among siblings thus impacting the quality of their human capital outcomes (Blake, 1981). Finally, the biological depletion hypothesis (BDM) proposed that the disadvantages for LBs arose from the fact that mothers are older and therefore less healthy (Hotz & Pantano, 2015). Closely related to the field, the birth-order mortality hypothesis describes that although both first and last-born children are at risk of dying, the latter are at greater risk in the postnatal period (Mishra, Ram, Singh, & Yadav, 2018).

Theoretical models and hypotheses here summarized encompass vast, diverse, and interdisciplinary empirical findings. In medicine, for example, the advantages of first-borns (FBs) regarding malnutrition (Jayachandran & Pande, 2017), immunization (Gavrielov-Yusim, Battat, Neumann, Friger, & Balicer, 2012), infections (Holman, Shay, Curns, Lingappa, & Anderson, 2003), and breastfeeding (Buckles & Kolka, 2014) have been analyzed. Also, it has been found that FBs smoke less and show better physical and mental health but exhibit higher rates of obesity and high pressure (Black, Devereux, & Salvanes, 2016) whereas LBs are heavier at birth and show lower rates of mortality (Fessler, Navarrete, Hopkins, & Izard, 2005). Economics research in high-income countries (HICs) provides evidence of better academic achievement (Black, Devereux, & Salvanes, 2004; Hotz & Pantano, 2015), schooling years (Booth & Kee, 2009; Kantarevic & Mechoulan, 2006), and earnings (Bertoni & Brunello, 2016) in FBs. However, on the other side of the controversy, studies from Ecuador (De Haan, Plug, & Rosero, 2014), Brazil (Emerson & Souza, 2008), and Peru (Higa, 2011) among others, report advantages for LBs. Interestingly, Esposito, Kumar, and Villaseñor (2020) studied the effects of BO in a Mexican cohort measuring educational results using data from the 2010 Census and had similar findings to research in HICs. In the field of psychology, personality and behavioral traits describing later-born children as more rebellious than first-born were described by Sulloway (1996, as cited in Esposito et al., 2020, p.1074). In line with his study, recent research has provided evidence regarding the advantages for LBs in pro-sociality (Salmon, Cuthbertson, & Figueredo, 2016).

In terms of early developmental outcomes, empirical data revealed that first-born children show better motor and social development (Lehmann, Nuevo-Chiquero, & Vidal-Fernandez, 2018), cognitive development (Kampouri et al., 2017; Lehmann et al., 2018), and communicative skills (Berglund, Eriksson, & Westerlund, 2005) than LBs. Notably, the role of a stimulating environment together with maternal characteristics such as age and education level are well documented in the literature (Fergusson & Woodward, 1999; Walker et al., 2011). However, for the most part, these findings represented the European and North American populations (Eckstein et al., 2010). Thus, the purpose of this study was to assess the interplay between BO and risk factors in impoverished environments where inadequate environmental stimulation, low maternal education, and young maternal age affect the developmental outcomes of children living in a LMIC.

2. Material and methods

A prospective cohort study was conducted from 1991 to 1994, with participants being evaluated at home monthly from birth to 24 months of age, and every three months from 24 to 36 months of age. Newborns were recruited from two public hospitals in Mexico City. Children included were newborns at term weighed more than 2500 gm, had Apgar scores equal to or above 8 (at the minute and five minutes) and were referred in the rooming-in service as healthy newborn babies. Only children completing at least 80 % of the assessments were included. Newborns with a congenital anomaly, fetal distress, or obstetric complication were excluded from the study. The Institutional Research Ethics Committee approved the protocol.

The newborn's demographic and perinatal variables, such as sex, Apgar score, BO status (FBs or LBs), weight, height, and breastfeeding, were obtained via medical records.

Developmental domains were assessed with the Gesell Developmental Schedules, in the version proposed by Cravioto and Arrieta (1982) adapted and validated for the Mexican population (Martínez-Vázquez, Alvarado-Ruiz, Sánchez-Pérez, & Muñoz, 2018). The qualification is expressed in equivalent days of development for each domain: motor, adaptive, language, and personal-social.

Stimulating environment (SE) was measured with the Home Observation for the Measurement of the Environment Inventory (HOME-Inventory) from 0 to 3 years in the 62 reactive version of Caldwell and Bradley (1984), adapted by Cravioto, Matsubara, López, and Arrieta (1998) and validated by Rivera, Figueroa, Soler, Sánchez, and Ávila (2010). The HOME scale is a well-known measure as an indicator of support for learning and stimulating environment in LMICs (Frongillo, Tofail, Hamadani, Warren, & Mehrin, 2014).

To evaluate socioeconomic status, maternal education and per capita income were assessed every six months, during the first three years of life,through interview questionnaires (Ontiveros-Mendoza, Cravioto, Sánchez-Pérez, & Barragán-Mejía, 2000). The evaluators were nursing, psychology, and education professionals trained and evaluated with a 0.98 inter-observer reliability in each collection instrument used.

2.1. Data analysis

The biological and psychosocial characteristics of newborns and their families at baseline were compared between included and excluded children. Afterward, these characteristics were described according to BO status (FBs in contrast to LBs). According to each case, quantiles and frequencies were used to describe quantitative and qualitative variables and compared using Mann-Whitney U or Chi-squared tests. The BO effects on different developmental outcomes were assessed through linear mixed-effects models with random intercept and random slope on time. For the analysis, child's chronological age in years was used as the time variable in the model. Because children were recruited from two different hospitals, we ran three levels of models using the hospital as the grouping variable at level three. The relevance of using three levels instead of two was tested using the likelihood ratio test for nested models. To improve the proxy in the growth curve, the squared time variable was included in the fixed part of the model. To obtain robust

estimates, the same term was included in the random part of the model (Warrington et al., 2014). Models were adjusted for maternal age, maternal education, HOME level, and income. Due to parsimony, non-significant effects were eliminated from the model under the hierarchical model's approach.

Finally, we tested second and third-order interactions, and intending the straightforward interpretation of significant third-order interactions, stratified models according to BO were used. For each model, a residuals diagnosis was performed. Also, based on the stratified models, predicted values at three years old and assuming different scenarios for each outcome were used to illustrate BO effects. The scenarios based on HOME level, maternal education, and maternal age were drawn using the first and ninth deciles. Hypothesis testing was conducted assuming a 0.05 significant level and statistical analysis was performed using STATA 13.

3. Results

The analyzed sample was composed of 49 newborns, 24 (49 %) were boys, and 25 (51 %) were FBs. Major baseline characteristics of the study population are shown in Table 1. Participants provided at least 24 measurements, and 19 (39 %) completed the goal of 28 measurements. Thus, in total, this analysis included 1321 repeated measurements. The likelihood ratio test for nested models on each outcome did not reject the null hypothesis that the third level's variance component was equal to zero. Therefore, two levels of mixed models were used. Through these models, we found that birth order had a significant role in all developmental domains. On average, first-born tended to show higher scores than later-born children. Interestingly, the first-born status's estimated effect differs among developmental domains depending on some maternal characteristic or HOME scenario in single or combined interactions.

In the motor domain, we found a statistically significant third-order interaction among BO, stimulating environment (SE), and time ($\beta = 1.152$; $p = 0.04$) (Table 2). After running stratified models according to BO, we realized that the effect of stimulating environment over time was significant and positive ($\beta = 0.880$; $p = 0.05$) on FBs but not on LBs (β=-0.154; $p = 0.67$) (Table 3). Predicted scores at three years old according to FB status, assuming the same maternal education (9 years) and using the first (67 %) and the ninth deciles (93 %) for stimulating environment are shown in Fig. 1A. That is, in FBs the predicted score increased from 1173 to 1227 (a difference of 54 days) when HOME scores increased, but this did not happen in LBs as the respective scores were 1134 and 1124. In addition to the third-order interaction, positive and significant interaction between maternal education and time was found ($\beta = 5.578$; $p = 0.02$), suggesting an increasing relation between maternal education and motor score over time.

Regarding adaptive development, a third-order interaction was detected between BO, sex, and maternal education ($\beta = 6.314$; $p = 0.02$) (Table 2), meaning that the effect of maternal education on the adaptive score is different for girls and boys. Through the stratified models, we realized that the interaction between sex and maternal education was statistically significant only for FBs ($\beta = 6.431$; $p = 0.003$) but not for LBs ($\beta = 0.367$; $p = 0.82$) (Table 3). Predicted values according to the combination of first-born status and sex under two different scenarios of maternal education are shown in Fig. 1B. The predicted score among FBs boys increased from 1061 to 1080 when maternal education changed from 6 (first decile) to 12 (ninth decile) years. Nevertheless, the opposite was predicted for FBs girls, for whom the score decreased from 1074 to 1055. In the later-born group, the boys' and girls' scores were quite similar (988 and 989) (977 and 976), respectively, regardless of the maternal education level.

Concerning language development, we noted two significant second-order interactions. One of them was between BO and time ($\beta =$

Table 1
Biological and Psychosocial Characteristics of Children and their Families.

	Total (N = 49)	First-borns (n = 25)	Later-borns (n = 24)	P
Infant characteristics				
First-born [yes], n (%)	25 (51)	—	—	—
Sex [boys], n (%)	24 (49)	9 (36)	15 (63)	0.064
Birth weight [kg]	3.10 (2.85; 3.35)	3.09 (2.83; 3.33)	3.10 (2.85; 3.35)	0.795
Birth length [cm]	50.0 (49.0; 51.0)	50.0 (49.0; 51.0)	49.5 (49.0; 51.0)	0.589
Gestational age [weeks]	39.0 (38.5; 40.0)	40.0 (39.0; 40.0)	39.0 (38.0; 40.0)	0.093
Apgar 1 min. [0−10]	8.0 (7.0; 8.0)	8.0 (7.5; 8.5)	8.0 (7.0; 8.0)	0.406
Apgar 5 min. [0−10]	9.0 (9.0; 9.0)	9.0 (9.0; 9.0)	9.0 (9.0; 9.0)	0.721
Breastfeeding [yes], n (%)	44 (90)	22 (88)	22 (92)	0.672
Breastfeeding duration [months]	7.0 (3.0; 10.5)	7.0 (2.0; 10.5)	7.5 (3.0; 11.3)	0.637
Parental characteristics				
Maternal age [years]	22.0 (20.0; 25.0)	21.0 (19.0; 23.0)	23.5 (21.3; 29.5)	0.002
Paternal age [years]	25.0 (22.0; 29.0)	22.0 (18.5; 27)	26.5 (25.0; 31.0)	0.002
Maternal education [years]	9.0 (7.0; 11.0)	10.0 (8.0; 11.5)	8.5 (6.0; 9.0)	0.048
Paternal education [years]	9.0 (6.0, 12.0)	9.0 (9.0; 12.0)	9.0 (6.0; 11.3)	0.055
Maternal occupation [household], n (%)	41 (84)	20 (80)	21 (88)	0.478
Paternal occupation [underemployed], n (%)	28 (57)	10 (40)	18 (75)	0.013
Maternal behavior profile [score]	105 (102; 110)	108 (102; 110)	105 (102; 106)	0.150
Environment				
Stimulating environment [0−100]	83.5 (78.3; 89.4)	87.3 (82.3; 90.3)	80.5 (76.4; 83.9)	0.002
Type of household, 12th month [nuclear], n (%)	39 (80)	18 (72)	21 (88)	0.178
Type of household, 36th month [nuclear], n (%)	44 (90)	22 (88)	22 (92)	0.672
Income per cápita [US$]	79 (63; 107)	97 (72; 126)	67 (43; 88)	0.001

Note. Median (P_{25}; P_{75}), unless another value is specified. P-value: for the comparison between first-borns and later-borns. Wilcoxon Rank-Sum Test or Pearson's Chi-squared test was performed for a numerical and categorical variable, respectively.

Table 2
Random Mixed Effects Models Coefficients of each Developmental Outcome.

	Motor		Adaptive		Language		Social-personal	
	β	(SE)	β	(SE)	β	(SE)	β	(SE)
Time	414.689	(34.830)**	402.462	(0.018)**	144.956	(19.599)**	129.824	(44.693)**
Time^2	−17.984	(3.746)**	−19.154	(3.669)**	41.408	(5.523)**	11.888	(3.349)**
Birth order (BO)	68.981	(55.857)	35.617	(23.163)	−12.972	(10.601)	−62.820	(47.199)
Sex			9.650	(13.769)				
Stimulating environment	0.184	(0.506)			−0.536	(0.275)*	−0.957	(0.384)**
Maternal age							−2.164	(1.282)*
Maternal education	−1.452	(1.480)	−0.119	(1.405)				
Interactions								
BO x Time	−86.428	(45.545)*			43.094	(16.208)**	163.829	(58.200)**
Maternal education x Time	5.577	(2.378)**						
Stimulating environment x Time	−0.191	(0.382)			0.598	(0.280)**	1.660	(0.296)**
Maternal age x Time							3.485	(1.580)**
BO x Stimulating environment	−0.859	(0.716)						
BO x Maternal age							2.402	(2.063)
BO x Sex			−62.394	(26.230)*				
BO x Maternal education			−3.301	(2.472)				
Maternal education x Sex			0.262	(1.692)				
BO x Maternal age x Time							−5.810	(2.537)**
BO x Stimulating environment x Time	1.152	(0.556)**						
BO x Sex x Maternal education			6.314	(2.768)**				
_cons	−31.119	(38.358)**	−15.869	(11.535)	101.393	(18.681)**	132.198	(42.104)**

Note. Time represents the infant's chronological age in years. Time^2 represent squared infant's chronological age in years. SE = standard error. β= coefficient regression.
* $0.05 \leq p < 0.1$.
** $p < 0.05$.

Table 3
Stratified Mixed Models Coefficients for Motor, Adaptive and Personal-Social Outcomes.

Variables	First-borns		Later-borns	
	β	(SE)	β	(SE)
Motor				
Time	327.174	(43.457)**	428.023	(41.093)**
Time^2	−12.703	(4.854)**	−23.581	(5.977)**
Stimulating environment	−0.561	(0.586)	0.069	(0.483)
Maternal education	−0.521	(2.047)	−1.882	(2.049)
Time x Stimulating environment	0.880	(0.459)*	−0.154	(0.365)
Time x Maternal education	5.462	(2.842)*	4.767	(3.839)
Intercept	23.977	(45.810)	−23.721	(37.320)
Adaptive				
Time	390.938	(8.713)**	414.234	(9.597)**
Time^2	−11.695	(4.822)**	−26.769	(5.194)**
Sex	−51.494	(22.065)**	8.779	(13.300)
Maternal education	−3.293	(2.004)	−0.103	(1.379)
Sex x Maternal education	6.431	(2.160)**	0.367	(1.641)
Intercept	26.615	(21.199)	−24.312	(12.100)**
Personal-Social				
Time	245.812	(53.811)**	153.751	(45.981)**
Time^2	9.454	(4.806)**	14.456	(4.655)**
Stimulating environment	−1.270	(0.598)**	−0.587	(0.483)
Maternal age	−0.159	(1.652)	−2.205	(1.238)*
Time x Maternal age	−1.398	(1.905)	3.516	(1.529)**
Stimulating environment x Maternal age	2.066	(0.469)**	−1.266	(0.369)**
Intercept	100.906	(55.163)*	107.814	(46.067)**

*Note.*Time represents the infant's chronological age in years. Time^2 represent squared infant's chronological age in years. SE = standard error. β= coefficient regression.
* $0.05 \leq p < 0.1$.
** $p < 0.05$.

43.094; p = 0.008; see Table 2). Fig. 1C shows the predicted trend over time according to BO under the assumption of having the same HOME score at the median (83.5 %). Both trends are growing but predicted scores increased faster in FBs than in LBs so that at three years old, first-born children may reach an average score of 1130 compared to 1014 for LBs. The other significant interaction was

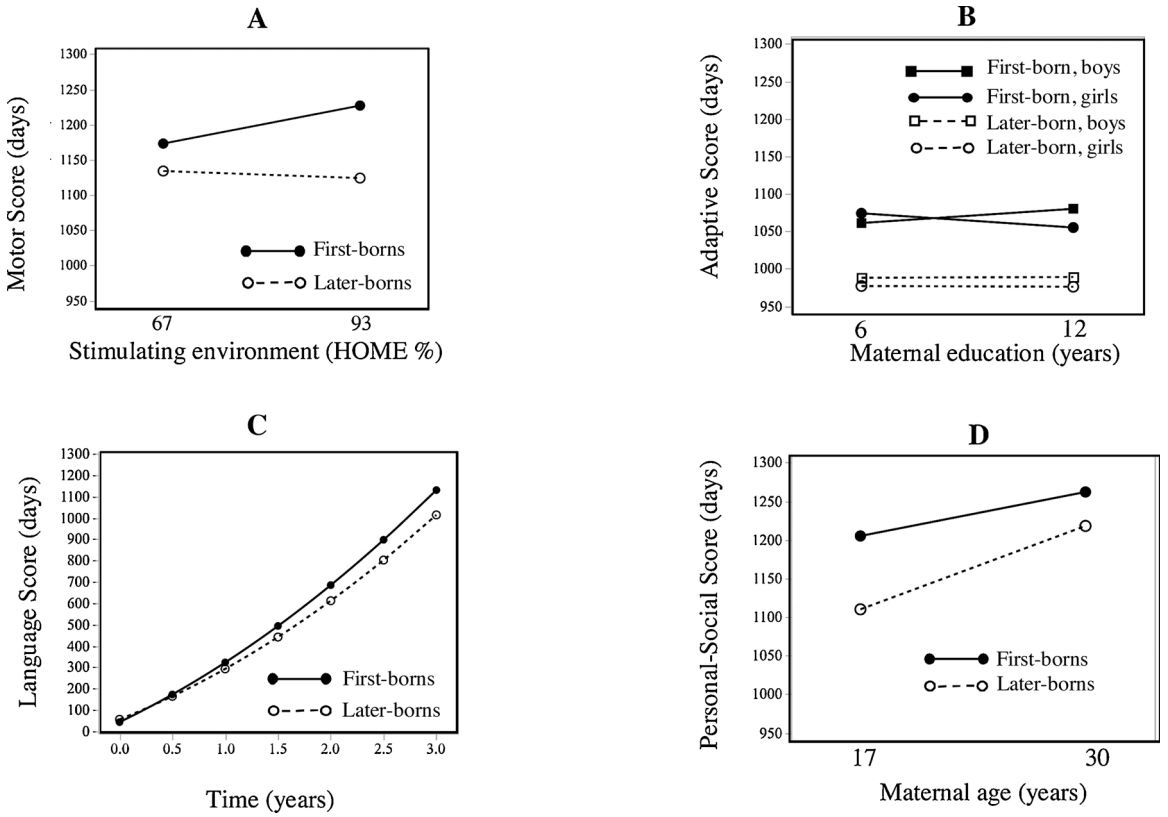

Fig. 1. Predicted scores for first-borns and later-borns at 3 years old for motor, adaptive and personal-social using different scenarios for stimulating environment, maternal education and maternal age (A, B, D) and over time for language (C), according to significant interactions found in the models and per domain.

between SE and time (β= 0.598; p = 0.03; Table 2). At three years old, the predicted score in the first decile of HOME (67 %) was 1051 compared to 1084 predicted for children in the ninth decile (93 %). Because BO does not participate in this interaction, these results are not shown in Fig. 1.

In the the social-personal domain, we found a significant third-order interaction between BO, maternal age, and time (β =-5.810; p = 0.02) (Table 2). After stratification according to BO, we observed that the effect of maternal age over time was significant only in LBs (β = 3.516; p = 0.02), but it was not significant in FBs (β =-1.398; p = 0.46) (Table 3). Specifically, at three years old, and assuming HOME constant in the median (83.5 %), the predicted score for LBs in the 10th percentile of maternal age (17 years old) was 1110 points while those in the 90th percentile of maternal age (30 years old) had a predicted score of 1218 points (108 points of difference). The corresponding scores for FBs were 1205 and 1262, respectively. It is worthy to note that FBs tended to present higher scores than LBs when the mother was young, but the difference tended to disappear as the mother was older, as shown in Fig. 1D.

When the residual diagnosis was performed, we observed a moderated normality and homoscedastic assumption deviation. However, since we are using the same polynomial terms in the fixed and random part of the model, coefficients are robust and type I error is not inflated (Jacqmin-Gadda, Sibillot, Proust, Molina, & Thiébaut, 2007; Warrington et al., 2014).

4. Discussion

The purpose of this study was to evaluate the effect of BO in early developmental outcomes and whether its effects were attributable to environmental stimulation, maternal age, or level of education in the context of poverty. The results obtained documented the impact of being first-born on child development, showing differences in the results obtained for the four developmental domains. These disparities made it possible to identify BO's effects over time, depending on other interacting variables such as environmental stimulation or a maternal characteristic such as age or level of education.

In the motor domain, our results coincide with Lehmann et al. (2018), who have established that differences in BO with advantages for FBs are expressed in motor and social development scores and occur during the first three years of life. In our study, the explanatory mechanism was identified through stratified models, observing that FBs show an advantage in the motor domain due to environmental stimulation over time. In LBs, this effect was not significant. Furthermore, a positive effect of maternal education on motor scores was identified in agreement with previous reports in Brazil (Santos, Gabbard, & Goncalves, 2001) and recent findings in Tanzania (Pitchik et al., 2018).

Data concerning the adaptive domain showed an interaction between the first-born status, sex, and maternal education. As illustrated, stratified models showed an advantage in FBs boys whose mothers have a higher education level. In contrast, FBs girls tend to go in the opposite direction as the predicted score went down as maternal education increased. The interaction between sex and maternal education was not significant for LBs. The findings of this investigation are in line with what has been argued by Carneiro, Meghir, and Parey (2013) as the multiple pathways in which maternal education may transmit its effects and agree with other Latin-American findings (Austin et al., 2006) that showed that nonetheless a 4th-grade education level, there is less delay in cognitive and mental-motor scores in mothers highly educated. Concerning sex differences, as recently suggested by United Nations Children's Fund (United Nations Children's Fund UNICEF, 2018), when assessing context-specific-situation to promote gender equality in early childhood care, there is a need to "cross-analyze gender-related data with other data" (p. 351), including additional analysis by maternal education to evaluate if a "gender dimension exists in the disparities" (p. 180).

Regarding language, our results suggest a significant effect of BO over time in such a way that at three years on average, FBs scored higher than LBs, equivalent to almost four months difference in predicted scores. This finding agrees with Berglund et al. (2005), who have documented that FBs scored higher than LBs in vocabulary comprehension and vocabulary production with a triple interaction showing advantages for boys (FBs and LBs) cared at home or day-care centers, in comparison to girls. Similarly significant, although in lesser magnitude, the stimulating environment (HOME) affected over time. This finding is in agreement with data reported longitudinally by Rodríguez and Tamis-LeMonda (2011). These authors showed that low rise and low decline stimulation trajectories groups fared the worst and had low quality already by 15 months. Hispanic mothers and mothers with less than 12 years of education were disproportionately represented in these groups, and mothers in their teens at the child's birth were more likely to be in the low to moderate range environment. Consistently, children living in higher stimulating environments were at an advantage on measures of later language, literacy, and cognitive skills. Interestingly, our study documented that although FB showed higher scores than LBs, a 90th decile stimulating environment compensated a later-born condition, remaining as future inquiry differences in lexical versus conversational skills according to a BO condition as suggested by Hoff-Ginsberg (1998) and in agreement with a "different" more than a "disadvantaged" LBs' early language perspective (Pine, 1995).

In the personal-social domain, our data provided evidence of two different effects. Although FBs obtained the higher averages overall, stratified models in LBs documented that this group's advantages were the result of a positive maternal age effect. This finding is in line with has been reported by Sutcliffe, Barnes, Belsky, Gardiner, and Melhuish (2012), who stressed that mothers aged 20 scored 0.28 standard deviations higher than mother aged 40 in socioemotional difficulties. Nonetheless, as suggested by Bornstein, Putnick, Suwalsky, and Gini (2006), the linkages between maternal age "qua a continuous variable" (p., 488) and parenting and child development are diverse. As recently proposed by Hickey et al. (2019), teenage parenthood is a "cumulative risk ingredient in disadvantaged contexts due to low cognitive stimulation and lower levels of emotional support" (p. 14). Concerning advanced maternal age, Tearne's review (2015) suggests that "in contrast to the heightened physical risks for offspring, the existing research suggests that children of older mothers are often at lower risk for problem behavior and academic outcomes" (p.1). However, we consider that all consideration about maternal age's effect on psychological outcomes in offspring should evaluate the impact of "concurrent child-rearing environment and psychosocial advantage-disadvantage" (p. 9).

Finally, one of the main strengths of this study is the meticulous longitudinal design in the first three years of life and carried out at the child's natural context. Those mentioned above allowed us to evaluate the support for learning and the environmental stimulation provided, highlighting what today is identified as part of nurturing care; construct recognized as a large-scale and multisector component of a policy (Britto et al., 2017) promoting supportive environments in favor of early childhood development (Richter et al., 2017). It is worthy to mention that the models used in our study were adjusted to the number of siblings, however, this variable was not significant. We assumed that because our participants were young mothers and the family size was small, only 8 out of 49 families had 3 or more children. Additionally, we assessed the difference between being the only child and the first-born but we did not find significant variance over time. We consider this might be because first-born children were the only child for almost all the period of the follow-up. Only 2 out of 10 FB children had a sibling before 24 months.

Using a reduced sample size may be a limitation of our study. However, employing a longitudinal analysis is the primary advantage because the differences among children in their baseline scores can be discriminated against from the changes over time within-subject. It is also important to mention that this study only included families with low socioeconomic levels because our interest was to focus on this population. Although children were recruited from two different hospitals, this fact did not represent an additional variability source because both hospitals are public and serve women in similar socioeconomic conditions. The design of this study allows us the between-family but not a within-family analysis, a limitation that Bornstein et al. (2015) has pointed out when assessing BO differences. These limitations notwithstanding, this study adds knowledge on the BO first-born effect and its impact on early childhood development, a relevant aspect for public policy planning to support low-income families and improve child welfare.

Ethical approval number

II1/01/0397.

Declaration of Competing Interest

Authors declare they have no conflict of interest.

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