

A Critical Meta-analytic Exploration of Birth Order Effect on L1 Onset Time of Speaking and Language Development Progression; Is the Pointer towards First or Later Borns?

Zohreh Nafissi

English Department, Alzahra University, Tehran, Iran

Marjan Vosoughi

English Department, Sabzevar Branch, Islamic Azad University, Sabzevar, Iran

Abstract—Among the various underlying issues behind First Language (L1) acquisition processes, child Birth Order (BO) effect is one of the recent revitalized enquires of research of the 1900s but is confounding with many contradictory results in the literature. In this research, the intention was to elucidate if first-born or later-born children typically outperform in their language development processes. To this end, a systematic meta-analytic examination of child BO from 1970 to 2014 was undertaken in major related databases including TIRE, CHILDES, John Wiley, Taylor & Francis, PubMed and Science Direct. Studies in which language development had been mapped on BO effect and published from 1970 were included and the rest excluded from initial data collection. Finally, the research outcomes in which BO effects had been claimed to have caused delayed language development among either of the groups mentioned above have been discussed critically to explicate the existing contradictory findings.

Index Terms—birth order, onset time of speaking, L1, child-directed speech, parental speech

I. INTRODUCTION

After going through broad and inevitable developmental processes like crying, babbling and first word stages within the first year of life, nearly any healthy kid will go through later combinations of multi-word stages until by around five years of age typically any normal kid will be using his/her first language in nearly as much complex as any mature native speaker (Cattel, 2007). It seems that the timeline is the same for all children but the stages at which the language variants emerge are accomplished unevenly and thus has been the target of various research studies within L1 domains. In this respect, one non-linguistic aspect of L1 being considered by L1 scholars as a key issue in such variability among children learning their native language has been the child's Birth Order (BO) of life, an issue which has formally been raised in the 1900s by Alfred Adler, the founder of Individual Psychology.

In essence, BO or '*family constellation*' refers to a person's place or rank in the family. Undeniably, BO effects denote that due to the presence of older siblings, both the quantity and quality of Child-Directed Speech (CDS) by the parents reduce to a lesser extent for the later borns compared with first-born or only children (Jones & Adamson, 1987; Rothbart, 1971; Wellen, 1985 & Woollett, 1986). BO and its possible consequences were more formally investigated in the early 20th century with some disparate studies in the databases like West (1871) or Galton (1874) cited in Ogden (2013). Specifically, West, (1871) also cited in Hellal and Lorch (2005) has apparently been one of the pioneers to identify individual differences concerning language acquisition patterns due to BO.

A. Context of the Problem

Fundamentally, the basic controversy among scientists regarding BO effect on L1 development has long been that people's place within the family may have a subtle impact in their tendency to exhibit a variety of characteristics. Such characteristics have long been explored ranging from body shape and intelligence to disease susceptibility and even sexuality tendencies (Ogden, 2013). After comparing the BO effects among both animals and human beings, Ogden reminded us of our distinct abilities and characteristics which must be deemed pertinent as far as our place in the family is concerned:

... BO may subtly influence our physical and mental health, our opportunities for education, and our careers. Not all younger siblings will be spoiled and allergy-free, not all middle-borns will be social butterflies, and not all older siblings will be tall, intelligent, responsible leaders, but our place in parity provides fascinating insights into the complexity that makes each of us unique. (p.43)

Generally speaking, two opposing viewpoints on the probable effects of child BO on delayed language development within L1 acquisition milieu exist in the L1 literature. There are some scholars believing that first-born children are in a better situation for developing their L1 elements (Afaghi, Mehri, Soleymani, Jalaie, and Azizi Zalani, 2013; Bornstein, Leach and Haynes, 2004; Fenson, Reznick, Bates, Thal, & Pethick, 1994; Goldfield and Reznick, 1996; Hart and Risley, 1995; Hoff, 2003; Jones and Adamson, 1987; Kowalski, Wyver, Masselos, & De Lacey, (2004); Leman, 2009; Parada, 2013; Pine, 1995; Price, 2000, 2008, 2013; Rodgers, Cleveland, Van Den Oord, and Rowe, (2000); Sulloway, 2001; Wellen, 1985; Woollett, 1986; Zyrianova, Chertkova Yu, and Pankratova, 2013; Zambrana, Ystrom, & Pons, 2012). Adversely, there are some having claimed that later-born children could develop their L1 via overhearing which moved them more forward in developing language skills by putting them in an enhanced situation compared with the first borns (Barton & Tomasello, 1991; Bornstein, et al., 2004). For example, Barton and Tomasello (1991) brought an example of pronoun usage internalization for first vs. second person pronoun referencing in overheard speech which had been proven to be beneficiary among some 19 later-born children; a situation that had not benefited the children with first birth rank. On the other hand, some researchers had claimed fewer opportunities for hearing parental speech and CDS to the later-born children which this could lead to fewer opportunities for them that might be disadvantageous in their language learning experiences (McCarthy, 1954; Wellen, 1985). In this status quo, there were also some researches in which there were no claimed effects for BO (Berkowitz, 2000; Skeat, J., Wake, M., Reilly, S., Eadie, P., Bretherton, L., Bavin, EL., and Ukoumunne, OC., 2010; Tomblin, JB., 1990). Berkowitz (2000) asserted that while BO, laziness, and bilingualism were all "commonly believed to lead to speech and language delay, their contributory role has never been proved" (p. 55). In Skeat et al. (2010) it was declared that precocity or early language development was not strongly influenced by the examined variables in their study comprising gender, birth order, birth weight, non-English speaking background, socioeconomic status (SES), maternal age, maternal mental health scores, and vocabulary and educational attainment of parents. No BO effect for language impairment was also reported by Tomblin, (1990) saying that the distribution of birth ranks of all language-impaired children within the sibships had not been found to show any evidence in favor of the conflicted children either with early or later born birth ranks. As clear, many claims and counterclaims existed in L1 literature for BO effect which brought an imperative puzzling question to us as to what probable factors might be involved in this complex web or matrix regarding their research methodologies that have possibly led to such variability from biological sciences to social arts and humanities.

B. Significance of the Study

Unfortunately, the research studies investigating BO effect on language development are rather few in number and inconsistent in terms of the reported results in the existing literature. Moreover, the due advantages of BO for first-born compared with later-born children have been investigated mostly as a subsidiary variable along with various other psychological aspects like personality, anxiety level, self-respect, identity, and occupational achievements, as well as educational attainment, but concerning BO in language development, scant attention has been paid by the scholars in the field (Kowalski, et al., 2004). This has been one of the main motives behind doing the present investigation. Thus, closely at issue here was examining the changing patterns of parents' exchange of information towards their children which have been at times sought in the linguistic environment as a pertinent factor and is allegedly said to influence the quality of language development progression and also Onset Time of speaking (OTS) among the target group above. Technically speaking, OTS refers to the development of expressive and communicative behavior from early infancy to the initiation of single-word utterances by the children (Masataka, 2003).

Therefore, the underlying assumption behind doing the present research was that the crucial individual characteristics of the different participants involved in various studies in terms of a comprehensive meta-analytic approach over the years might reveal some hidden aspects in this regard. Thus, the questions that were specifically addressed in the present investigation were:

1. What possible linguistic variability could be found in the L1 literature among the speech of first-born vs. later-born that justly and thus validly characterized BO effects on delayed language development among either first or later-born children?
2. Do finally first-born or later-born children take over in their OTS and successive language progression rate?

II. METHODOLOGY

In this review survey, the researchers tried to analytically audit the previous research undertakings in which BO had been focused as a fundamental topic for diffusion of language data for a kid concerning his/her first words. In clear terms, the main intention was to make it clear through a systematic meta-analytic examination if children's BO is claimed by the majority of the L1 researchers to have any specific effect on the first-born children compared with later-born children regarding their OTS or not. Many other effects of BO on other child-related aspects of life were retrieved including the impact of BO on the children stunting, language stuttering onset time, mortality rate, handedness, and psychological effects for BO like attachment security, Theory of Mind (Tom) and aggression along with many others which were excluded from the initial data collection phase. Below, the strategies in retrieving the essential data for our meta-analysis is first described.

Data collection procedures

An examination of child BO from 1970 to 2014 was undertaken over major databases on both applied and pure linguistics including Science Direct (SD), John Wiley, Pubmed, Child Language Data Exchange System (CHILDES), Taylor & Francis (TF), and The International Research Foundation for English Language Education (TRIF). The major applied search terms were mainly "birth order", "BO effect", "L1 and BO", "first language development" along many others pertained to BO. Meanwhile, those researches in which BO effect was not directly related to children's linguistic achievement were excluded in the data collection stage. Accordingly, to verify the retrieved research data, the information behind each article proposing any claims for or against BO effect and language development were mapped over similar undertakings in other databases and parallel disciplines in order to depict maximum comparability of results. Explicitly, we were seeking to find ample evidence and facts in the above-cited databases in order to provide substantial facts so as to see if later-born children (second or third) have their first stage OTS sooner than their first-born siblings or lag behind and what processes have been pondered about by the L1 scholars in this precedence among the target group.

III. REVIEW RESULTS AND DISCUSSION

As shown in Table 1 below, the results of major, relevant journal articles and books regarding BO effect has been first depicted. For brevity purposes, the most prominent ones in which BO effect had been addressed as the major and not controlling variable have been classified chronologically from 1973 till 2013.

TABLE 1.

A SAMPLE OF RETRIEVED RESEARCH ARTICLES ON BO EFFECT BRIEFING THE EXPLORED THEMES AND THEIR RESULTS

No.	The retrieved sources	Results obtained for BO effect
1	Introduction to Descriptive Linguistics/Linguistics and Language/ Julia Falk, 1973	She discovered that her daughter who couldn't say the word spoon, after being reminded some similar combinations like "sun" or "pun", couldn't understand what she was being told. She probably knew the word "spoon" but she couldn't just pronounce or articulate it.
2	Quantitative review of the only child literature: research evidence and theory development/Psychological Bulletin/Falbo & Polit, 1986	Firstborns, only children, and children with one other sibling scored higher on tests of verbal ability than later borns and children with multiple siblings.
3	Everyday experiences of first-and later born infants. Minneapolis/Poster presented at the 11 th biennial meeting of the International Society for the Study of Behavioral Development/ Leyendecker,1991	First-born children experience more dyadic interaction with their parents. Younger siblings have more sophisticated conversational skills.
4	Convention and contrast in the acquisition of verbs./Clark, Neel-Gordon, & Johnson, 1993	The practicing kid had given clear evidence of a vocabulary spurt just prior to her first production of two-word combinations, while the non-practicing one had shown no signs of a spurt but demonstrated steady acquisition of new words and produced word combinations early, within a few weeks after production of his first word.
5	Variability in early communicative development/Monographs of the Society of Research in Child Development./Fenson et. al., 1994	Small but reliable negative correlation was found between some lexical elements of language as to breadth and depth of knowledge that favored first-borns.
6	Measuring the vocabulary spurt: A reply to Mervis & Bertrand/ Journal of Child Language /Goldfield and Reznick,1996	First-born children showing more probability towards producing a spurt compared with second-borns
7	Birth order effects on early language development: Do second born children learn from overheard speech?/Child development/Oshima-Takane, Goodz & Derevensky, 1996	In pronoun production and not overall language development, second born children conquered over the first-borns at both ages.
8	The relation of birth order and SES to children's language experience and language development/Applied Psycholinguistics/Hoff, 1998	1. First-born children were identified as more advanced in lexical and grammatical development than later-born. 2. Later-borns were more advanced in conversational skills. 3. High SES showed more advanced lexical development than mid SES.
9	Resolving the debate over birth order, family size, and intelligence/ The American Psychologist /Rodgers, et al., 2000	No relationship was found between BO and intelligence, let alone the verbal skill sub-assets of the IQ test.
10	Birth Order, Sibling Competition, and Human Behavior/ Conceptual Challenges in Evolutionary Psychology: Innovative Research Strategies: Dordrecht and Boston: Kluwer / Sulloway, F.J. 2001	Firstborns are more conscientious, more socially dominant, less agreeable, and less open to new ideas compared to later-borns.
11	The specificity of environmental influence. Socio-economic status affects early vocabulary development via maternal speech/Child Development /Hoff, 2003	1. Mean birth order of the higher SES children was higher than that of mid SES children. 2. Gender had no effect.
12	Toddlers' emerging symbolic play: a first-born advantage? / Early Child Development and Care/ Kowalski et al., 2004	A relationship may exist between birth order and the frequency of symbolic imagination reflected in language in mixed-age play.
13	Parent-child quality time: does birth order matter?/Human Resources/Price, 2008	Compared with the second-born children, the first-borns received 20 more minutes of quality time from father and 25 minutes from mother. Such quality time increased for families of higher SES.
14	In conversation with children / First language acquisition/ Clark, Eve. V., 2009	An early vocabulary spurt reflects changes in children's skill at producing words. This might indicate advances in articulatory motor skill rather than insight into the symbolic value of words. But he gives more prominence to the practice rate of children.
15	Defusing the childhood vocabulary explosion/Science/McMurray, 2007	Understanding BO effect in word spurts is a complicated issue confounded with various factors.
16	Why You Are the Way You Are". / The Birth Order, New York: Dell Publishing/ Leman, 2009	A brief review: If spacing between the first and later children is more than five years in age, BO characteristics may not apply. Spending more quality with parents and undiluted or pure resources are mentioned for such effect.
17	Birth Order Position and Pro-social Tendencies. /Schw ä r & Mahony, 2012	Although no definitive relationship was found between prosocially tendencies and BO, only between middle-borns and last-borns was the BO effect significant. As to altruism, Middle-borns had scored higher in their pro-social tendencies.
18	Early vocabulary and gestures in Estonian children/ Journal of child development/ Schults, Tulvist & Konstabel, 2012	First-born children had an advantage over later-born children in the production of common nouns.
19	Sibling Variation and Family Language Policy: The Role of Birth Order in the Spanish Proficiency and First Names of Second-Generation Latino/Language, Identity & Education/Parada, 2013	1. As to the CDS language variant -Spanish vs. English, (72) % of the minority language speaking families in the US regarded the firstborn as speaking the "best" Spanish, with far fewer (23%) mothers reporting that the second-born child was the most skilled in this respect. 2. Interestingly, the first-born were also most often selected (at 67%) as the most proficient speakers of English.
20	Rehabilitation College, Tehran University of Medical Sciences/ Afaghi, et. al., (2013)	There was a significant relationship among the ability of comprehending passive sentences and age, birth order and parents education. Just correlational reports are given but any indication of what mechanisms might be involved as to BO effect for comprehending passive sentences is missing in this study.

As the table designates and in line with the proposed questions, two major aspects of L1 language development for BO effect were found to be more conspicuous in the literature; namely, a) *lexical knowledge* and b) *conversational skills*. Below, each will be examined in the light of the retrieved studies respectively.

A. BO Effect and L1 Lexical Knowledge Progress

The BO effect on the vocabulary knowledge which, by way of experiments, due to its tangible nature, received lots of attention by the L1 investigators is first open folded.

In the studies cited, lots of word-related aspects of language development had been considered and across various languages. concerning the BO effect and developing L1 lexical knowledge rate and quality, two aspects of vocabulary knowledge including 1) depth and breadth of L1 vocabulary and 2) word spurts were found more fixated in the eyes of the L1 scholars, which are reviewed one by one in the following sections.

1. The depth and breadth of L1 vocabulary knowledge among the first vs. later borns

Concerning the depth of L1 vocabulary knowledge and BO effect, one can mention the researches made by some recent scholars like (Berglund, et al., 2005; Bornstein, et al., 2004; Fenson, 1994 et al., & Hoff-Ginsberg, 1998 & Schults et al, 2012).

Fenson et al. (1994, p. 84), for example, found that concerning word combining and the Mean Length of Utterance (MLU), a 'small but reliable negative correlation' could be found between these elements of language that favored first borns. Bornstein, et al., (2004) found that mothers reported larger receptive and expressive vocabularies in their first borns. Berglund, et al. (2005), on the other hand, found some counter evidence saying that first-born children just reached the 50-word milestone earlier than later-born children, then after that stage there are no differences in vocabulary production between first and later-born children. This had also been verified by Pine (1995) explicating that first borns had reached the 50-word milestone, on average, one month earlier than their younger siblings—indicating a 'small but significant birth-order effect' (p. 272). Berglund et al. (2005) then concluded that:

"...it seems that the BO effect is limited just to the OTS not to the overall attainment rate". (p. 490)

According to Berglund, it seemed then that in the long run BO effect couldn't be thought to bring about any significant differences among first vs. later borns. This was rejected by Schults et al (2012) though. In their study, regarding comprehension and production of common nouns among girls and boys of different BO ranks, they found that first-born children had an advantage over later-born children and this effect was more conspicuous among girls esp. at social terms and expressions.

Another aspect pertained to the children's lexical development under the influence of BO on OTS was 'word spurts'. Below, the retrieved data on word spurt will be explicated.

2. Word Spurts and BO

Technically, the term 'Word spurt' refers to the abrupt onset of language that most children achieve around 18 months or so. As to the interactive effect of BO and word spurts, i.e. the production of first words by the children not at a steady pace but unexpectedly, Goldfield and Reznick (1990, 1996) explored the correlations between the presence or absence of a word spurt and BO. Their results pointed to the fact that apparently, first-born children were slightly more likely to show a spurt in production compared with second borns. Conversely, Clark (2009) brought another evidence to the study by Goldfield and Reznick (1990, 1996) suggesting that an early vocabulary spurt that reflected changes in children's skill at producing words might indicate advances in articulatory motor skill rather than insights into the symbolic value of words but it gave prominence to the practice rate of children. In his study, he brought an example on comparing two such children-both first-borns (Clark et al., 1993). Apparently, the practicing kid had given clear evidence of a vocabulary spurt just prior to her first production of two-word combinations, while the non-practicing one had shown no signs of a spurt but demonstrated steady acquisition of new words and produced word combinations early, within a few weeks after production of his first word. This issue had also been raised and approved by Dromi (1987). Accordingly, receiving the symbolic value of words alongside practice effects had been associated with developing motor skills in children since it involved production assets with itself. He added that some vocabulary spurts couldn't be considered spurts at all since words were outlined along various levels of difficulty; when a child learnt a new lexical item, s/he was, in fact, adding the word to a repertoire of a larger vocabulary stock that might or might not have helped in understanding the meaning of the word along with having the necessary motor skills for producing that word for us to consider the utterances produced as such by the children as a word spurt.

Goldfield (1996), in reply to Mervis & Bertrand, worked on the probable correlations between the presence or absence of a word spurt and BO. Their results indicated that first-born children again showed more probability towards producing a spurt compared with second borns. However, no account of how it was managed was reported but Clark (2009). He brought a counter argument which was in direct opposition to the gained result in Goldfield's study. He asserted that an early vocabulary spurt could reflect changes in children's skill at producing words and this might indicate advances in articulatory motor skills rather than insight into the symbolic value of words. He gave more prominence to the practice rate of children, though. Accordingly, Clark presented the complex task of researchers to identify word spurts themselves in understanding the BO effect. In a rather recent work by McMurray (2007), cited in Clark (2009) a computational modeling of the above-mentioned factors was presented showing that a vocabulary spurt is simply the natural product of parallel learning combined with variations in difficulty that complicated the BO effect

in developing the children's lexical items. In the same vein, some other scholars had also mentioned the same findings (Anisfeld, Rosenberg, Hoberman, & Gasparini, 1998; Redford & Miikkulainen, 2007).

B. The Impact of BO and Developing Conversational Skills

The other identified and mostly focused aspect of L1 acquisition as to BO effect in the selected databases was that of conversational skills. Among some influential papers investigating BO and conversational skills, we found Clark, (2009), Evans, Maxwell, & Hart, (1999), Hoff-Ginsberg (1998) and Jacobs, & Moss, (1976). In Hoff-Ginsberg's study, first-born and later-born children in higher SES vs. middle SES families were compared by studying the language addressed to children and their rates of language development. By age, later borns were found more advanced in conversational skills. Interestingly, the pointer now was moving gradually to the later borns, though again, as expected, inconsistencies in the results were also common in the literature. Regarding the verbal skill prominence as to BO effect, Falbo and Polit (1986), for instance, had found that first borns, only children, and children with one other sibling scored higher on tests of verbal ability than later borns and children with multiple siblings. This was also in line with Jacobs and Moss' study (1976) in which it had been claimed that mothers' higher interaction behavior with their first-born children had caused second borns to lag behind in their language development processes compared with first born children. In by Rodgers et al., (2000), the predominance of first borns in verbal skills of IQ tests was disputed via a comprehensive meta-analysis. They had retrieved the relevant data from National Longitudinal Survey of Youth (NLSY) of USA, by examining a large randomly selected sample of US families. Their sample included children whose academic performance had been reviewed multiple times throughout their academic careers. In this study, no relationship was found between BO and intelligence, let alone the verbal skill sub-assets of the IQ test. This study was not in line with a previous similar investigation by Cropley and Ahlers (1975) on IQ and BO for verbal skills. In this study, sixty only boys who had no siblings had been compared with sixty-four firstborn children at two age levels. The results showed the outperformance of First borns compared with the only kids which indicated development of verbal abilities had been mainly facilitated by contact with parental models of language behavior.

Concerning developing more conversational skills, some other scholars like Leyendecker (1991) raised BO matter as a factor by suggesting that overhearing and participating in conversations with older siblings had helped a later-born younger child to develop language by being provided with a more varied and sophisticated model of conversation among the family. The complexity of individuals in speaking with other members of the family might be attributed to some psychological effects that provoke the later-borns to experience more quality talks compared with their older siblings. Schwär and Mahony (2012), for instance, examined the link between psychological birth order position and different types and levels of pro-social tendencies. By pro-social tendencies, it was meant the likelihood that an individual engages in '*voluntary actions for helping other groups of individuals*'. Then, although no definitive relationship was found between pro-social tendencies and BO, only between middle-borns and last-borns was the BO effect found significant. As to altruism, Middle-borns had scored higher in their pro-social tendencies which implied that middle-borns were more altruistic than last-borns. As stated later in this research, such effect for BO on the altruism subscale were explained by the sociability factor of the NEO Five-Factor Inventory and agreeableness measures (Beck, Burnet, & Vosper, 2006 and Paulhus, Trapnell, & Chen, 1999, all cited in Schwär and Mahony 2012). Tendency among the middle-borns to experience more conversational skills was claimed among them to exist due to some perceived self-worth in terms of interpersonal acceptance and evaluation from their company in Kalkan, (2008) cited in Schwär and Mahony, (2012) which provoked them towards more sophisticated conversational skills.

In Evan's et al., study (1999), the number of people living in the house and the amount of parent-child speech were surveyed. It was found that adults in crowded homes spoke to their children in less sophisticated ways than adults in less-crowded homes. And adults in more crowded settings were less responsive verbally to their children. This finding was independent of SES but since there were more crowding in lower SES homes, this was likely to impact lower SES children more than the ones with higher SES. In other words, the children in lower SES families were less likely to produce more sophisticated language in communicating with others. This fact had been pondered by some other scholars like Farran and Ramey (1980) and Savaú (2006) as true. They claimed that in lower SES families, apart from lower size of sophisticated language directed to children, the quality of more sophisticated language, even if directed to the children couldn't generally be warranted. In Farran and Ramey's study, it was found that mothers with medium level of education and income had gradually more time to take care of their babies at the age of 6 to 20 months, while mothers with lower educational levels and income had even less. Moreover, mothers at the first group had played with their children two times more than the mothers in the second group. The contribution of the above-cited to language development is made more obvious when we consider the fact that language development depends on the frequency and quality of mutual communication interactions between the child and his/her environment. Savaú (2006), cited in Sevinç and Önkol, (2009) also reported that language development is slow in children of mothers in the second group described above. In a recent comprehensive study by Price (2008), the amount of parental quality time for the first vs. second borns was examined. By way of calculation, he estimated that among two-child families, on average, the first borns daily received twenty more minutes of quality time from father and twenty-five minutes from mother compared with the second-born children. Such quality time increased for families of higher SES because the first borns had experienced repeated periods of higher quality parental exposure (Price, 2000, cited in Bonesrønning, & Massih, (2011). Such impact had been thought by some scholars as long-lasting in the children's course of life. In this regard, it's been claimed

that the children in lower SES homes cannot compensate the inadequacy of the talk s/he has heard. This issue had been raised by Hart & Risley (1995) in that the effects of SES, IQ and children's language production in terms of both amount and quality had all been associated with progress in elementary school. In other words, the more language data the children had had during their earlier stages of life, the better results they achieved in their achievement levels on some standardized tests. Walker, Greenwood, Hart, & Carta, (1994) had come up with the same results among some five to ten year-old subjects.

Regarding the interactional patterns that are directly influenced by BO, Dunn's study (1983) was very interesting. In this study, Dunn had noted that for later-borns, the direction of interaction was usually towards siblings not the parents as experienced with first-borns. Concerning sibling interaction, it was mentioned that since communication is mainly nonverbal, older siblings' talk towards their younger siblings mainly consisted of '*prohibition*' and '*directives*'. In this situation, such statements generally included a high proportion of pronouns and pro-forms and were highly repetitive. The same finding pertained with pronoun production predominance were gained some years later by Oshima-Tkane et al., (1996) through investigating second-born children's overheard speech. Overall, some distinguishing features for the predominance of later-borns over their older siblings in other investigated conversational aspects in other studies like Gleason, (1973), cited in McCabe, (1989) showed the same results. In McCabe's study, it was also noted that the force by the older siblings on their beginning language learning younger siblings to use social expressions was clearly detectable, like "please" and "thank you," expressions which were already demanded by the parents to be used by the first-borns (p.11). McCabe classified children in two dimensions characterized by two learning styles termed as '*reverential*' versus '*expressive*'. In reverential styles, the more conspicuous features are the predominance of common nouns, slower rate of speech but faster language learning stages. On the other hand, expressive style stands itself out by a predominance of pronouns rather than nouns, slower vocabulary development, language use mainly for social interaction using formulaic structures and slower language development. After describing the two variants for L1, McCabe argued that later-borns were more expressive-oriented compared with the first borns with reference to conversational skills.

All in all, claims and counter claims were abundant in this line of enquiry and lots of ideas and their opposing counterclaims puzzled us to a great extent.

IV. CONCLUSION

In the present meta-analytic study, the researchers tried to bring to the readers' mind what had been done on BO effect over OTS and language progression among first vs. later-born (second and more) children in the existing literature from 1970 till 2013.

To reiterate the proposed questions, in this study, the intention was to specify what possible linguistic variability could be found in the literature that justly characterized BO effects on probable delayed language development among children? As the review results showed and in line with the first research question, two lines of research were conspicuous in this regard, namely lexical knowledge and conversational skills. Obviously many research data had brought evidence in favor of first borns concerning these two lines of enquiry (Afaghi, et al, 2013; Bornstein, et al., 2004; Falbo and Polit, 1986; Fenson et al., 1994; Goldfield and Reznik, 1996; Hart & Risley, 1995; Hoff, 2003; Jones & Adamson, 1987; Kowalski, et al., 2004; Leman, 2009; Parada, 2013; Pine, 1995; Price, 2000, 2008; Redgers, et al, (2000); Sulloway, 2001; Wellen, 1985 & Woollett, 1986). Now, we wondered why the scale of language development was more weighted for the first borns in many linguistic aspects compared with the later borns.

Researchers' claimed reasons for the outperformance of first borns

In line with the second research question the present review, though inconclusive in its final results, found more research findings favoring first-born children in both their OTs and overall language development practices. Generally speaking, four main underlying reasons were mostly found in action favoring first-born children; namely, 1) more access and quality time with parents, 2) SES effects, 3) practicing effects along with 4) some psychological characteristics in favor of the first borns which are explicated with evidence-based results, below.

In Kowalski et al., (2004) in which the influence of older peers on younger children's emerging symbolic imagination for vocabulary knowledge was examined, a relationship was thought to exist between BO and the frequency of symbolic imagination reflected in language in mixed-age play. It was thought that first-borns may have had more access and quality time with parents accordingly they have outperformed the later borns in this regard. As we saw, having more quality time with parents on the part of the first borns and only child had also been engrossed in many other research data above (Hart & Risley, 1995; Jones & Adamson, 1987; Leman, 2009; Leyendecker, 1991; Price, 2000; Wellen, 1985 & Woollett, 1986). Regarding linguistic background, due to variant environments for first vs. later-born children, Leyendecker (1991), for instance, reported the same effects saying that first-born children spend significantly more time with their caregivers in activities that come up with dyadic interaction compared with later-born children. Accordingly, first-born children may benefit from more face-to-face attention from their caregivers that involves one-to one interaction. In other words, later-born children are believed to generally spend more time in multi-speaker contexts not in dyadic contexts as happens more to the first-borns. Apart from the nature of interaction, hitherto, the amount of CDS in later borns is also lessened, though it's to the maximum for the first children. Overall, the distinguishing features of exposure typology for the first borns are then more CDS extent with more quality time that is

prone for developing first words sooner. This status quo is, by nature, different for the later borns in the sense that the CDS typology changes more into multi-party exchange of information that is likely to improve other aspects of language development in future stages of life for the children involved.

Apart from quality time, other researchers had sought the effect of SES favoring again the first borns that had received more quality time compared with their younger siblings. Hoff (2003) had investigated this line of research by surveying the BO with SES effects of early vocabulary development via maternal speech. The higher mean birth order of the higher SES children favoring the first borns over that of mid-SES children was associated with different properties of maternal speech as a function of SES.

Still, another claimed underlying reason by some scholars in favor of first borns was practicing effect. As to practice effect and BO concerning word spurts, for example, Clark et al., (1993) examined two first-born children with practicing and non-practicing modes of some vocabulary items. He indicated that the practicing kid had given clear evidence of a vocabulary spurt just prior to her first production of two-word combinations, while the non-practicing one had shown no signs of a spurt but demonstrated steady acquisition of new words and thus had produced word combinations earlier, within a few weeks after production of his first word i.e., the effect of practice rate along with promoting symbolic value of words had been mentioned to work alongside one another not in isolation. This aspect of word spurt was frowned on by McMurray (2009), though. He proposed a very interesting interactive model that indicated the complexity involved in associating the outperformance of the first over the later borns concerning word spurt and practicing effect. He believed that a vocabulary spurt was simply the natural product of parallel learning combined with variations in difficulty that complicated the BO effect in developing the children's lexical items.

Paralleled psychological and biological characteristics with BO effect in favor of first borns was also deemed probable in the examined data. In Sulloway's work, (2001) regarding the BO effect on promoting five personality factors, first borns were found to be more successful since they were considered as more conscientious and more socially dominant. Although being less agreeable and less open to new ideas compared to later-borns, they were albeit deemed as more successful communication partners. Here, among the traits, the first two traits including conscience and social dominance was justified by this researcher as highly helping the first-borns to overcome the later borns in taking turns and contributing to a full-fledged conversation compared with their younger sisters or brothers. In clear terms, BO has long been considered as a crucial underlying factor in promoting five personality factors including openness, conscientiousness, extraversion, agreeableness and neuroticism (Sulloway, 2001). But, in the existing literature, it's not clear how these five personality traits which are highly relevant to a successful communication on the part of the first borns, in effect, why the later-borns prove to be more successful? Sulloway argued that first borns are more conscientious, more socially dominant, less agreeable, and less open to new ideas compared to later borns. Among the traits, the first two traits can highly help the first borns overcome the later borns in taking turns and contributing to a full-fledged conversation compared with their younger sisters or brothers. The previous researchers all related the more successful conversational skills of the later borns to overhearing that had happened more to them and not to any embodied psychological effects (Goodz, 1994; Hoff-Ginsberg & Kruger, 1991; Mannle, Barton, & Tomasello, 1991, all cited in Oshima-Takane et al., 1996). Quite recently, Harris (2006) criticized Sulloway's ideas for some conflicting findings. As Lamb and Smith (1982) had already indicated, BO could possibly be eliminated, reinforced, or likely altered by later experiences of the children in life. "...development is continuous, with individuals continually adjusting to the competing demands of socialization agents and biological tendencies". This was congruent with the same interpretation that was developed a decade later by Hart & Risley (1995) above. Regarding paralleled confounding factors with BO which worked in favor of first borns, the study by Zambrana et al (2012) was prominent. Doing a longitudinal exploration on the impact of birth order, child gender, maternal education, and language comprehension, they found out that between 18 and 36 months of age, first-born girls of mothers with high educational attainment had the highest increase in their language comprehension skills at 36 month of age. Accordingly, being firstborn or having a highly educated mother had not been claimed to compensate for the lower performance of first-born boys compared with girls.

In a nutshell, this has admittedly led more scientists not to support the claims made in the studies which solely rely on BO effects without considering other confounding variables like family size, SES assets, biological factors, personality aspects, etc. For example, in those large families which are more likely to be from a lower SES than smaller families, are the children more affected by coming from larger and thus poorer families or having a particular trait? Is it due to birth order, to family size, or to any number of other variables? Such confounding variables, in effect, might have led to some inconsistent results in the literature.

To cut a long story short, overall, lots of criticisms could be raised concerning the methodological flaws for both campaigns like the incompetency of experimentations arising from comparisons between natural settings of the children and the modeling experiments. Providing the exact relevant natural setting for the experimental vs. control groups is a far-reaching task since the complex evolving process that swiftly changes over the child's mind, admittedly, calls for various simulated case studies that take into account life trajectories through pervasive observation methods and across different socio-cultural settings for the children rather than controlled experimental conditions that probably narrows the realities involved. Prompted by many critical researchers, the complexity of L1 acquisition mechanism of each child should thus be pictured in more fully-functioning research designs (Oshima-Takane, et al., 1996).

Finally it's interesting to note that concerning BO effects, existing meta-analytic researches in the databases, which were very few in numbers, were also diverse in reporting and mostly inconclusive like the one by Ernst and Angst (1983). After reviewing all the research data published between 1946 and 1980, they found no substantial effects for BO and concluded that birth order research was inconclusive in nature. In a recent meta-analytic survey by Chairmay and Thinkhamrop, (2006), it was concluded that in contrast with inconsistencies reported for BO effect, both Perinatal factors like antenatal care along with postnatal factors like birth order, parental education, environmental factors, gender of the children, and family history with specific language impairment can influence language development. The debate still continues. Maybe further researches can clarify this interesting line of research with more scrutiny in near future.

REFERENCES

- [1] Adler, A. (1964). *Problems of neurosis*. New York: Harper and Row.
- [2] Afaghi Y., Mehri A., Soleymani Z., Jalaie, Sh., & Azizi Zalani, H. (1392:2013). Standardization of the comprehension passive sentence in children with normal hearing 3 to 8 years and 8 years compared with children with severe hearing loss in Central Tehran. *Modern Rehabilitation Journal*, 7(4), 1-7.
- [3] Anisfeld, M., Rosenberg, E. S., Hoberman, M., & Gasparini, D. (1998). Lexical acceleration coincides with the onset of combinatorial speech. *First Language* 18, 165–184.
- [4] Bachman, L. F., & Palmer, A. (2010). *Language assessment practice: Developing language assessments and justifying their use in the real world*. USA: Oxford University Press.
- [5] Barrett Martyn, D. (1995). Early lexical development. In P. Fletcher & B. MacWhinney (eds.), *Handbook of child language* (pp. 362–392). Oxford: Blackwell.
- [6] Barton, M. E., & Tomasello, M. (1991). Joint attention and conversation in mother-infant sibling triads. *Child Development*, 62, 517- 529.
- [7] Bates, E., & MacWhinney, B. (1987). Competition, variation, and language learning. In: B. MacWhinney (Ed.), *Mechanisms of language acquisition* (pp. 157–194). Hillsdale, NJ: Lawrence Erlbaum.
- [8] Berglund, E., Eriksson, M., & Westerlund, M. (2005). Communicative skills in relation to gender, birth order, childcare and socioeconomic status in 18-month-old children. *Scandinavian Journal of Psychology*, 46(6), 485-491.
- [9] Bornstein, M., Leach, D., and Haynes, O.M. (2004). Vocabulary competence in first- and second-born siblings of the same chronological age. *Journal of Child Language* 31, 855–873.
- [10] Bonesrønning, H. & Massih, S.S. (2011). Birth order effects on young students' academic achievement. *The Journal of Socio-Economics*, 40, 824–832.
- [11] Cattel, R. (2007). *Children's language: Consensus and Controversy*. Antony Rowe Ltd, Wiltshire: England.
- [12] Chairmay, B., Thinkhamrop, B & Thinkhamrop, J. (2006). Risk factors associated with language development problems in childhood--a literature review. *Journal of Medical association of Thailand*, 89(7), 1080-6.
- [13] Clark, Eve V., Neel-Gordon, A., & Johnson, S. (1993). Convention and contrast in the acquisition of verbs. Paper presented at the Sixth International Congress for the Study of Child Language, Trieste, Italy.
- [14] Clark, Eve V. (2009). *First language acquisition*. 2nd. Ed. Cambridge: Cambridge university press.
- [15] Cropley A. j., and Ahlers, K. H. (1975). Development of verbal skills in first-born and only boys. *Journal of Biosocial Science*, 7, 297-306. doi:10.1017/S0021932000010178.
- [16] Dromi, E. (1987). *Early lexical development*. Cambridge: Cambridge University Press.
- [17] Ernst, C. & Angst, J. (1983). *Birth order: Its influence on personality*: Springer-Verlag: Berlin. 1983.
- [18] Evans, G. W., Maxwell, L. E., & Hart, B. (1999). Parental language and verbal responsiveness to children in crowded homes. *Developmental Psychology* 35, 1020–1023.
- [19] Falbo, T. & Polit, D. F. (1986). Quantitative review of the only child literature: research evidence and theory development, *Psychological Bulletin* 100(2), 176–189.
- [20] Falk, J.S. (1973). *Linguistics and Language*, Canada: John-Wiley and Sons Inc.
- [21] Farran, D. C., & Ramey, C. T. (1980). Social class differences in dyadic involvement during infancy. *Child Development* 51, 254-257.
- [22] Fenson, L., Dale, P. S., Reznick, J. S., Bates, E., Thal, D. J. & Pethick, S. J. (1994). Variability in early communicative development. *Monographs of the Society of Research in Child Development* 59(5), Serial No. 242.
- [23] Gleason, R. (1961). *Introduction to Descriptive Linguistics*. New York: Rinehart & Winston Inc.
- [24] Goldfield, B. A., & Reznick, J. S. (1996). Measuring the vocabulary spurt: A reply to Mervis & Bertrand. *Journal of Child Language* 23, 241–246.
- [25] Harris, J. (2006). *No Two Alike: Human Nature and Human Individuality*, New York: Norton.
- [26] Hellal, P. & Lorch, M. (2005). Charles West: A 19th century perspective on acquired childhood aphasia. *Journal of Neurolinguistics* 18, 345–360, Elsevier Ltd.
- [27] Hoff-Ginsberg, E. (1998). The relation of birth order and socioeconomic status to Children's language experience and language development. *Applied Psycholinguistics* 19, 603–629.
- [28] Hoff-Ginsberg, E., & Kruger, W.M. (1991). Older siblings as conversational partners. *Merrill Palmer Quarterly* 37, 465-482.
- [29] Hoff, E. (2003). The specificity of environmental influence. Socio-economic status affects early vocabulary development via maternal speech. *Child Development* 74, 1368–1378.
- [30] Jacobs, Bs. & Moss, HA. (1976). Birth order and sex of sibling as determinants of mother-infant interaction. *Child Development*, (2), 315-22.
- [31] Jones, G.P., & Adamson, L.B. (1987). Language use in mother-child and mother-child-sibling Interactions. *Child Development* 58, 356-366.

- [32] Kowalski, H. Wyver, Sh., Masselos, G. & De Lacey, Ph. (2004). Toddlers 'emerging symbolic play: a first-born advantage?'. *Early Child Development and Care*, 174 (4), 389-400. doi: 10.1080/0300443032000153435.
- [33] Lamb, M. E., & Sutton-Smith, B. (1982). *Sibling Relationships: Their Nature and Significance of the Lifespan*. Lawrence Erlbaum Associates.
- [34] Leman, K. (2009). "Why You Are the Way You Are". The Birth Order, New York: Dell Publishing.
- [35] Leyendecker, B. (1991, July). Everyday experiences of first-and later born infants. Poster presented at the eleventh biennial meeting of the International Society for the Study of Behavioral Development, Minneapolis.
- [36] Masataka, N. (2003). *The onset of Language*. Cambridge: Cambridge university press.
- [37] McGarthy, D. (1954). Language development in childhood. In L. Garmichael (Ed.), (2d ed.), *Child psychology* (pp.492-631). New York: Wiley.
- [38] McCabe, A.E. (1989). Differential language learning styles in young children: the importance of context. *Developmental Review* 9, 1-20.
- [39] McMurray, B. (2007). Defusing the childhood vocabulary explosion. *Science*, 317, (5838): 631 DOI: 10.1126.
- [40] Ogden, L.E. (2013, September 7th). Luck of the draw. *New Scientist*, 219(2933), 40-43.
- [41] Oshima-Takane, Y. (1985). The learning of pronouns. Unpublished Ph.D. dissertation, submitted to McGill University.
- [42] Oshima-Takane, Y. (1988). Children learn from speech not addressed to them: The case of Personal pronouns. *Journal of Child language*, 15, 95-108.
- [43] Oshima-Takane, Y., Goodz, E., & bDerevensky, J. (1996). Birth Order Effects on Early Language Development: Do Second-born Children Learn from Overheard Speech? *Child Development*, 67(2), 621-634.
- [44] Parada, M. (2013). Sibling Variation and Family Language Policy: The Role of Birth Order in the Spanish Proficiency and First Names of Second-Generation Latinos, *Journal of Language, Identity & Education* 12(5), 299-320, doi: 10.1080/15348458.2013.835572.
- [45] Pine, J. M. (1995). Variation in vocabulary development as a function of birth order, *Child Development* 66, 272-281.
- [46] Price, J. (2008). Parent-child quality time: does birth order matter? *Journal of Human Resources* 43 (1), 240-265.
- [47] Redford, M. A., & Miikkulainen, R. (2007). Effects of acquisition rate on emergent structure in phonological development. *Language*, 83, 737-769.
- [48] Rodgers, J.L., Cleveland, H.H, Van Den Oord, E. & Rowe, D.C. (2000). "Resolving the debate over birth order, family size, and intelligence". *The American Psychologist*, 55 (6): 599-612. doi: 10.1037/0003-066X.55.6.599. PMID 10892201.
- [49] Rothbart, M. (1971). Birth order and mother-child interaction in an achievement situation. *Journal of Personality and Social Psychology*, 17, 113-120.
- [50] Sevinç M, & Önkol, F. L. (2009). Language processing skills of 5-6 years old Turkish children attending monolingual and bilingual preschool education. Paper presented at WCES2009, Procedia Social and Behavioral Sciences, 1378-1383, Elsevier Ltd. doi:10.1016/j.sbspro.2009.01.243.
- [51] Schults, A., Tulviste, T., & Konstabel, K. (2012). Early vocabulary and gestures in Estonian children. *Journal of child Language*, 39(3), pp. 664-86. doi: 10.1017/S0305000911000225. Retrieved from Epub 2015, January, 30.
- [52] Schwär, G. & Mahony, A. (2012). Birth Order Position and Pro-social Tendencies. *Journal of Psychology in Africa* 22 (1), 56-60.
- [53] Skeat, J., Wake, M., Reilly, S., Eadie, P., Bretherton, L., Bavin, EL., and Ukoumunne, OC. (2010). Predictors of early precocious talking: a prospective population study. *Journal of Child language*, 37(5), pp. 1109-21. doi: 10.1017/S030500090999016X.
- [54] Sulloway, F.J. (2001). Birth Order, Sibling Competition, and Human Behavior. In Paul S. Davies and Harmon R. Holcomb, (Eds.), *Conceptual Challenges in Evolutionary Psychology: Innovative Research Strategies*. Dordrecht and Boston: Kluwer Academic Publishers. 39-83.
- [55] Tomblin, JB., (1990). The effect of birth order on the occurrence of developmental language impairment. *British journal of disorders in communication*, 25(1), 77-84.
- [56] Walker, D., Greenwood, C., Hart, B., & Carta, J. (1994). Prediction of school outcomes based on early language production and socioeconomic factors. *Child Development* 65, 606-621.
- [57] Wellen, G. J. (1985). Effects of older siblings on the language young children hear and produce. *Journal of Speech and Hearing Disorders* 50, 84-99.
- [58] Wells, C. G. (1975). The contexts of children's early language experience. *Educational Review* 27 (2), 114-25.
- [59] Wells, Gordon. (1985). *Language development in the pre-school years*. Cambridge: Cambridge University Press.
- [60] Woollett, A. (1986). The influence of older siblings on the language environment of young Children. *British Journal of Developmental Psychology* 4, 235-245.
- [61] Zambrana, IM., Ystrom, E., & Pons, F. (2012). Impact of gender, maternal education, and birth order on the development of language comprehension: a longitudinal study from 18 to 36 months of age. *Journal of developmental and behavioral pediatrics*, 33(2), pp.146-55. doi: 10.1097/DBP.0b013e31823d4f83.
- [62] Zyrianova, N. M., Chertkova Yu., D., & Pankratova, A.A. (2013). The Influence of Birth Order and Family Size on the Relationships between Cognitive Abilities and Personality Traits. Paper presented at V Congress of Russian Psychological Society, *Procedia- Social and Behavioral Sciences* 86, pp.262 - 266.

Zohreh Nafissi is a faculty member of the English Language Dep't at Alzahra University, Tehran, Iran, where she served as the Head of Dep't for 3 years. She received her MA and MPhil from Glasgow University, Scotland, and her PhD in TEFL from Allameh Tabatabai University. She has been teaching postgraduates for the past 5 years and presented over 20 papers at national and international conferences. Her main research interests are ESP, Teacher Education, Learner Identity, Linguistic Imperialism, etc.

Marjan Vosoughi is a full-time faculty member of the English Dep. at Islamic Azad University of Sabzevar, Iran. Presently, she is a PhD candidate of TEFL at Al-Zahra State University of Tehran, Iran. She has published many articles on applied linguistics in various international journals as well as in related conference proceedings in her major at both National and International levels. Her areas of interest include L2 Reading, CALL, Sociolinguistics & TESOL.