

Exploring the L2 Acquisition Outcome of Simultaneous Bilinguals and The Influence of Input

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Abstract. Simultaneous bilingualism refers to bilingualism where the bilingual is exposed to both languages from birth and learn two languages before the age of three. Such bilinguals become native-like in both languages (called balanced bilingualism), or have a stronger and weaker language (called unbalanced bilingualism). Therefore, this article depicts simultaneous bilinguals' learning outcome of their weaker language from syntax, phonetics, and vocabulary acquisition, and discusses the influence of input on the acquisition process. Specifically, in their lesser exposed language, simultaneous bilinguals follow monolingual developmental patterns in syntax acquisition, maintain acceptable language-specific distinctions but produce non-nativelike overlaps phonetically, and generally have smaller a receptive and expressive vocabulary than monolinguals. Quantity of input is crucial to the success of simultaneous bilingualism and balanced bilingualism, and heavily influences vocabulary acquisition. This article provides directions for future research in simultaneous bilingualism and the function of input in language acquisition.

Keywords: Simultaneous bilingualism, Balanced bilingualism, Language learning outcome, Input.

1. Introduction

Two types of bilingualism (or multilingualism, which will not be specifically discussed in the discussion that follows) have been distinguished by prior research in second language acquisition (SLA) based on the duration of exposure to two languages: simultaneous bilinguals and sequential bilinguals. Bilinguals exposed to multiple languages from birth and who have learned two different languages before three years old are known as simultaneous bilinguals, whereas sequential bilinguals are bilinguals who are exposed to and acquire an L2 (second language) after that period, when children gain initial mastery of an L1 (first language) [1]. While sequential bilinguals are more extensively studied in the field of SLA, simultaneous bilinguals are worthy of special research interest, as their acquisition of languages could provide different perspectives on the nature of human language acquisition.

Only in particular linguistic contexts where exposure to many languages is present do simultaneous bilinguals develop. Therefore, the family and society at large should be at least bilingual in simultaneous bilingualism; for example, a bigger society where many official languages are spoken (like Singapore and Canada) may be bilingual. Or, as is the case with immigrants and minorities speaking an ethnic language, the family may speak one language while the rest of society speaks another. In these situations, simultaneous bilinguals are also referred to as heritage speakers. Also, parents in the family may speak multiple languages at home, especially as native speakers of different languages, regardless of the official language of the society. Either way, children always master the dominant language spoken in the society (also called the majority language) [2] [3], but do not always speak the other languages they are under exposure (e.g., [2]). Meanwhile, simultaneous bilinguals can also be categorised according to their relative proficiency in the languages they speak; some simultaneous bilinguals can achieve similar, native-like proficiency in both languages (also called balanced bilingualism), but many simultaneous bilinguals exhibit different levels in their languages and are thus coined unbalanced simultaneous bilinguals [4]. A stronger language and a weaker language can be identified because for them, one language invariably “prevails” over the other—almost usually the one with more exposure. The majority language is nearly always the stronger one, particularly after kids start going to daycare and school and spend some time interacting with the

outside world. Therefore, to avoid confusion in the following discussion, the L1 of simultaneous bilinguals in the following discussion refers to the stronger language, which, unless specified, is the majority language, and L2 the minority language; in societies where both languages are of equal social status (see Sebastián-Gallés et al. [5] for an example of the equal co-official status of Spanish and Catalan in Barcelona), the language more frequently used at home is referred to as the L1 of the simultaneous bilingual, and the other the L2.

An overall description of the acquisition outcome of simultaneous bilingualism has not yet been provided, despite the fact that research involving simultaneous bilinguals either compare them to sequential bilinguals or native speakers of their respective languages. Thus, the purpose of this paper is to address the L2 acquisition outcome for simultaneous bilinguals as well as input, the one aspect that has been found to have a significant impact on the acquisition outcome.

2. The L2 Acquisition Outcome of Simultaneous Bilinguals

This section will explore the L2 acquisition outcome of simultaneous bilinguals. The notion that simultaneous bilinguals learn both of their languages as L1s is supported by a large body of current research [4] [6] [7], i.e., simultaneous bilinguals acquire language in a manner akin to that of monolingual kids [8] [9], which is particularly true in the case of learning grammar or syntax. For example, using corpus data from two French/German simultaneous bilingual children whose weaker language is French, Bonnesen examined the language acquisition of unbalanced simultaneous bilinguals (i.e., the proficiency of one of their languages was significantly higher than the other) [4]. He concentrated on certain grammatical problems where L1 and L2 French learners showed distinct developmental patterns, such as the usage of null subjects, subject clitics, and negation. His analysis showed that the children's weaker language followed the L1 acquisition pattern instead of the L2 pattern (in the sense of sequential bilingualism) in these respects, indicating that both the stronger and weaker languages of simultaneous bilinguals develop as L1s despite a delay in the development of the latter. Gathercole also focused on the grammatical aspect of language acquisition in investigating simultaneous bilinguals' acquisition pattern of the weaker language [10]. Testing second and fifth-grade English and Spanish-speaking children, he discovered that simultaneous bilingual children followed similar patterns as native speakers in their acquisition of specific grammatical structures albeit more slowly, and by fifth grade, they caught up to monolingual classmates. Silva-Corvalán examined heritage speakers, second or third generation US immigrants, who learned and spoke an L1 in their social environment (at school) but an L2 (typically their ethnic language) at home [11]. She discovered that the syntax of their L2 did not show signs of sequential L2 acquisition, but rather followed developmental patterns of L1 acquisition. However, differently from Gathercole, she concluded that heritage speakers exhibited incomplete, or halted, acquisition of their L2 by the age of six, which offered an explanation for adult heritage speakers' grammatical simplification in their minority language [11].

In other aspects of language acquisition, simultaneous bilinguals did not follow monolinguals' L1 acquisition pattern so closely. Another essential component of language learning is phonetic acquisition, which is where simultaneous bilinguals differed slightly from native speakers. A monolingual infant's capacity to identify the sounds of the language in their environment—which will eventually become their native language—improves dramatically between the ages of 6 and 12 months, while their capacity to differentiate a range of non-native phonemic contrasts drastically deteriorates [12]. However, simultaneous bilingual infants exposed to two languages exhibited acquisition patterns different from monolingual infants. Bosch and Sebastián-Gallés used a familiarization-preference procedure to evaluate 4-month-old and 8-month-old infants from Spanish monolingual, Catalan monolingual, and Spanish-Catalan bilingual environments. Their objective was to determine whether these infants could perceive a vowel contrast that is present in Catalan but not in Spanish, /e/-/ɛ/, as well as the development of language-specific phonetic contrastive categories in the early stages of life. [13]. They found that 4-month-old babies could perceive a contrast, and 8-

month-old infants did not perceive a contrast, but a follow-up test revealed that 12-month-old children regained the ability to perceive that contrast. Not only did the results of this study imply that simultaneous bilinguals retained the capacity to distinguish phonemic contrasts in more than one language at the age of 12 months, they also uncovered a developmental pattern in language development for bilingual infants, i.e., infants may confuse phonemic sounds in their L2 at the age of 8 months, but can master the distinction of phonemic sounds in both languages at 12 months of age.

The difference between simultaneous bilinguals' L2 proficiency and native speakers of the language persists in adulthood. When comparing the representation of L2 words as well as non-words between early bilinguals (i.e., sequential bilinguals who learned an L2 from an early age) and simultaneous bilinguals who speak Spanish and Catalan, Sebastián-Gallés et al. concluded that simultaneous bilinguals performed worse than Catalan-native sequential bilinguals in the perception of specific L2 contrasts, which had lexical-level implications [5]. This remains the case in phonetic production: when Macleod and Stoel-Gammon measured the Voice Onset Time (VOT) of consonantal stops in the spoken language of adult Canadian English-French simultaneous bilingual speakers, they found that simultaneous bilinguals performed similarly to monolinguals in phonetic variation and phonemic contrasts for all consonantal stops except the English voiced stops, preserving acceptable distinctions between the languages while also lowering the processing load by overlapping some contrasts [14]. In conclusion, simultaneous bilingual babies may still be able to identify L2 phonemic differences by the time they are 12 months old, but they may also not be able to do so as adults. In oral production, simultaneous bilinguals may pronounce certain L2 phonemic contrasts that partially overlap with their L1 differently from native speakers, which may be caused by the need to decrease the cognitive processing load.

Another aspect of simultaneous bilinguals' language acquisition is vocabulary acquisition, which in the case of L2 is typically lower than that of monolinguals of that language. While German-French simultaneous bilingual children in Quebec aged 2 to 5 had receptive vocabulary levels comparable to monolingual children in their dominant language, French, their receptive vocabulary levels in German were lower than those of German monolingual children, according to a study by MacLeod et al. [15]. Also, the receptive-expressive gap was generally greater in children's L2 than in their L1, meaning that simultaneous bilingual children frequently perform worse in their less-exposed language than would be expected according to their receptive knowledge in terms of expressive vocabulary and semantics [16].

In sum, studies on the L2 proficiency of simultaneous bilinguals mainly concentrate on aspects of syntax, phonetic, and vocabulary acquisition, portraying an overall view of simultaneous bilinguals' L2 proficiency. Instead of learning their L2 as sequential bilinguals do, simultaneous bilinguals learn their L2 as an L1, following the same developmental pattern as L1 acquisition. Phonetically, simultaneous bilingual infants may continue to confuse phonemic contrasts at the age of 8 months, but at 12 months, they may be able to regain the distinction in their less-exposed language. In their spoken L2, simultaneous bilinguals can make acceptable language-specific distinctions but may produce overlaps differently than monolinguals. Semantically, the L2 receptive vocabulary of simultaneous bilinguals is smaller than that of monolinguals, and their L2 receptive-expressive gap is larger than their L1 gap.

However, several questions remain unresolved in the L2 acquisition outcome of simultaneous bilinguals. For instance, why do some simultaneous bilinguals exhibit incomplete grammatical acquisition as adults, while others catch up to their monolingual peers in adolescence? At what stages in life do simultaneous bilinguals' ability to perceive phonemic contrasts exclusive to their L2 fluctuate? What is the L2 vocabulary level of balanced simultaneous bilinguals compared to their L1, and to that of native speakers? And most importantly, why do some simultaneous bilinguals achieve balanced bilingualism, while others do not? Is there a parallel between unbalanced bilingualism and fossilisation in sequential bilingualism?

3. Influence of Input on Simultaneous Bilinguals' L2 Acquisition Outcome

As stated before, not every child who is exposed to multilingual contexts learns a second language [2]. Among other things, input has a significant role in determining how well future simultaneous bilinguals acquire the language, and this is particularly evident in family language usage. This part will therefore go over the relationship between simultaneous bilingualism success and family language use, as well as how input affects simultaneous bilinguals' L2 acquisition results.

The phrase "family language use" here refers to the languages that family caregivers speak at home, which is generally acknowledged to have a significant impact on the achievement of simultaneous bilingualism [2] [17] [18]. A common three-way classification of family language use is as follows: 1) One-parent-one-language (OPOL), where each parent speaks a respective language at home; 2) minority language at home, in which just the minority language (or socially non-dominant language) is spoken by both parents; and 3) mixed languages, in which both parents speak two languages at home [2] [19].

According to Sirén's analysis of questionnaire data from 600 bilingual homes in Sweden, children were more likely to speak the minority language if both parents spoke it exclusively or if one parent spoke it and the other spoke both the majority language (Swedish) and minority language at home [20]. This is one of the studies that look into how family language use may predict simultaneous bilingualism in children. Similarly, Yamamoto discovered that children in Japan who had two parents who spoke English at home or two parents who spoke English and one parent who also spoke Japanese were more likely to speak English [21]. A sample of 111 Japanese households with at least one English-speaking parent served as the basis for this finding.

Analysing questionnaire data from 1899 bilingual families in Flanders, Belgium, where Dutch was the official and majority language, De Houwer produced more quantitative data on the success rate of child simultaneous bilingualism for types of family language use [2]. First, the success rate of child simultaneous bilingualism was the highest when both parents spoke the minority language exclusively at home (97% of the families), followed by when one parent spoke both the minority language and Dutch and the other parent spoke the minority language only (93% of the families), echoing Sirén and Yamamoto [20] [21]. Additionally, 74% of families that implemented the OPOL strategy had at least one child speaking the minority language. Lastly, only 36% of households with one parent speaking Dutch exclusively and the other speaking both Dutch as well as the minority language had children who spoke the minority language. De Houwer concluded that family language use was linked to children's minority language proficiency and that the OPOL strategy was "neither a necessary nor a sufficient condition" for the minority language to be successfully transmitted (p. 420) [2]. More importantly, she also noted that children in single-parent households where one parent spoke only the minority language at home had a lower percentage of acquiring that language (42 out of 46 families, or approximately 91%) compared to two-parent households where both parents spoke only the minority language at home (nearly 97%), and boldly proposed that frequency of input was likely influential to children's successful L2 acquisition.

Verhagen et al. confirmed that notion upon conducting surveys on 136 bilingual families in the Netherlands [3]. Their findings revealed variations in input properties among various family language usage patterns and the impact of those patterns on the Dutch and minority language proficiency of simultaneous bilingual children; these effects vanished after they controlled the input properties. They therefore came to the conclusion that the quantity of input, rather than patterns of family language use, predicted children's L2 proficiency. This emphasized the significance of input on children's language acquisition in multilingual environments and echoed Pearson's assertion that quantity of input is the most significant factor influencing a child's success in becoming bilingual. Children will become more proficient if they interact with speakers of the language more often; conversely, if they do not receive enough input, they will not utilize the language [22].

This naturally leads to a question: how much input do simultaneous bilingual children receive? Spending considerable time in childcare or school where the majority language is spoken, children in bilingual families often receive imbalanced exposure to each language, especially in OPOL families.

For example, all but one child in Macleod et al. received at least 71% input in the majority language French in a typical week, whereas the exception child received 71% input in German because his family had just moved to the province of Quebec from Germany [15]. In their study, the weaker language's receptive vocabulary for simultaneous bilinguals developed more slowly due to this imbalance in input quantity, whereas their stronger language's receptive vocabulary developed at the same rate as monolingual peers. When children attended full-time childcare in the majority language (the aforementioned exception excluded), the OPOL approach could not provide enough input to support children's development of the minority language, resulting in unbalanced bilingualism. On that basis, the authors surmised that there was a necessary percentage of input in each language for children to achieve balanced bilingualism.

Macleod et al. came to their results based on an examination of vocabulary acquisition, the most thoroughly researched component of language learning in studies on the impact of input on simultaneous bilinguals' L2 acquisition [15]. It is fairly obvious why vocabulary acquisition is the most studied aspect of language acquisition in discussions on the influence of input: due to the arbitrary nature of language, learners cannot rely on general applications when learning vocabulary, unlike when learning grammatical rules. As a result, learners must learn each word individually, and bilinguals must learn two words for each lexical item [23]. Therefore, a correlation exists between the amount of exposure and vocabulary learning [3].

Sun et al., who argued that the quantity of input—i.e., whether the input is rich or poor—should be taken into consideration in bilingual studies, highlighted the differential influence of learning environment [24]. When examining the vocabulary of L1 English and L2 ethnic languages in simultaneous bilinguals, the language they were less exposed to [16].

Therefore, what percentage of input in each language would be beneficial for children to achieve balanced bilingualism? A specific percentage was put forward by Thordardottir: exposure rates of 40% to 60% of both languages led to similar receptive vocabulary levels in both languages compared to monolingual children; as for productive vocabulary, an exposure rate over 60% was required to achieve performance comparable to monolingual children [25].

Though widely speculated, opinions on the function of input in phonetic acquisition for simultaneous bilinguals mostly remain just reasonable speculations without support from empirical evidence. Unfortunately, investigations on the influence of input in the early years of life produce contradicting evidence, and thus the specific role of input in phonetic acquisition remains a mystery. In some research concerning international adoptees, children who were exposed to their birth language, but that exposure was discontinued, performance and functional magnetic resonance imaging (fMRI) data led to the conclusion that early language experience gave adoptees phonological advantages in the language when they came across the language again in adulthood (e.g., Choi et al., 2017, as cited in [26]; Pierce et al., 2015, as cited in [26]). However, a number of other behavioural and brain imaging studies produced data unsupportive of this conclusion, finding no difference between the performance and brain activity of international adoptees and native speakers of their country of adoption without prior experience to the adoptees' birth language (Ventureyra et al., 2004, as cited in [26]; Pallier et al., 2003, as cited in [26]).

As for syntax acquisition, the role of input currently remains unclear as well. The reduction of quantity and quality in input (i.e., less input than that a monolingual child would receive and input limited to certain registers) often exists in the weaker language (e.g., [4] [11]), and while it may be suggested that input quantity and quality are largely responsible for the incomplete acquisition of syntax observed in heritage speakers [11], no substantial proof has been produced.

To recap, patterns of family language use are highly related to the success rate of child simultaneous bilingualism: the success rate was as high as 9 out of 10 when one parent spoke the minority language with or without the majority language and the other parent spoke the minority language exclusively, while the OPOL approach neither guarantees success in child simultaneous bilingualism, nor is a necessary condition. However, the amount of input—without enough input, children might not master the minority language—rather than the pattern of family language use itself

determines whether a child succeeds at simultaneous bilingualism. Regarding language acquisition, simultaneous bilinguals' L2 vocabulary acquisition is largely influenced by input, perhaps even more so than their L1 vocabulary acquisition; they have a wider receptive-expressive gap in the language they are less exposed to, and it is advised that simultaneous bilingual children receive between 40% and 60% of their input in both languages in order to attain balanced bilingualism that is on par with their monolingual peers. However, the impact of input on the acquisition of phonetics and syntax has not yet been confirmed; it has only been hypothesized rather intuitively.

4. Conclusion

This article discusses the language acquisition outcome of simultaneous bilinguals' weaker or minority language, as well as the influential role of input in their language acquisition. In summary, simultaneous bilinguals exhibit different patterns from sequential L2 acquisition in their acquisition of more than one language. Simultaneous bilinguals may either develop a grammar in their L2 similar to that of native speakers or they may exhibit incomplete acquisition and only have a simplified grammar. Their syntax acquisition follows the same developmental patterns as the L1 acquisition of monolinguals and does not follow those of L2 acquisition in sequential bilingualism. In terms of phonetics, newborns momentarily mix up phonemic contrasts unique to their less exposed language, but they eventually acquire the ability to tell them apart. However, adults may still misinterpret the same phonemic contrasts, thus this skill may be lost again. And in vocabulary acquisition, simultaneous bilinguals' vocabulary depends largely on input, which not only influences the receptive and expressive vocabulary of bilingual children, but also impacts the success rate of children being simultaneously bilingual in a bilingual family and/or society. Therefore, it is advised that parents in bilingual families ensure between 40 and 60 percent input in the minority language by either having both speakers use the minority language at home or having one speaker use the minority language while the other uses the majority language along with the minority language. This will improve vocabulary acquisition in general and simultaneous bilinguals' weaker language in particular. For successful simultaneous bilingualism, the OPOL method is not advised because families using it typically only guarantee less than 30% input in the minority language. Such investigation of simultaneous bilinguals' language acquisition can obtain data from a special group of language users found only in certain linguistic environments, providing answers that probe into the nature of human language acquisition.

More research on balanced bilingualism, however, can be done in the future to find out why some language learners succeed while others fail. Factors influencing the syntax, phonetics, and vocabulary of simultaneous bilinguals' minority or poorer language are examples of potential directions. Future studies can also explore the precise function that input plays in simultaneous bilinguals' language learning, a topic that has been briefly hypothesized in talks but not supported by empirical data.

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